



## MINUTES

### BEAR RIVER COMMISSION ANNUAL MEETING ONE HUNDRED TWENTY-EIGHTH COMMISSION MEETING APRIL 19, 2016

## BEAR RIVER COMMISSION

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#### CHAIR

Jody Williams

#### IDAHO COMMISSIONERS

Gary Spackman  
Kerry Romrell  
Curtis Stoddard

#### UTAH COMMISSIONERS

Eric Millis  
Blair Francis  
Charles W. Holmgren

#### WYOMING COMMISSIONERS

Sue Lowry  
Sam Lowham  
Gordon Thornock

#### ENGINEER-MANAGER

Don A. Barnett

**I. Call to order** - The annual meeting of the Bear River Commission was called to order by Chairwoman Jody Williams at 1:30 p.m. on Tuesday, April 19, 2016, at the Utah Department of Natural Resources building in Salt Lake City, Utah. This was the one-hundred twenty-eighth meeting of the Commission. Kevin Payne was sitting in for Sam Lowham from Wyoming. Williams asked the Commissioners and audience to introduce themselves. An attendance roster is attached to these minutes as Appendix A.

Williams noted the passing of Don Gilbert who had served as a Commissioner from Idaho for three terms. He helped negotiate the Amended Bear River Compact, which was executed in 1978. He always had the interests of the Bear River Basin and the people at heart. A card was circulated for signatures to be sent to the Gilbert family.

Williams then addressed the agenda for the meeting. The agenda was approved and a copy is attached to these minutes as Appendix B.

**II. Approval of minutes of last Commission meeting** - Williams asked if there were any changes to the draft minutes of the previous Commission meeting held on November 17, 2015, in Salt Lake City, Utah. A motion was made to approve the minutes with no changes. The motion was seconded and passed.

**III. Reports of Secretary and Treasurer** - Randy Staker handed out a sheet showing income and expenditures to date for FY 2016. He noted that, with two and a half months remaining in the fiscal year, the financial situation was healthy. The interest rate had gone up a little bit. Expenses to date totaled \$106,669.47, leaving a cash balance in the account of \$127,717.69. He reported that he had received the water quality payment from the State of Idaho, and when payments come in from Wyoming and Utah, that will bump the income up a little more.

Regarding the proposed budget for 2017, Staker noted an increase of 2 percent in the stream gaging costs, personal services contract and clerical, which increases the budget by just a little under \$2,000. The proposed budget for 2018 shows another 2 percent increase in the same categories. Copies of Staker's handouts are attached in Appendix C.

Eric Millis reported that in the Records and Public Involvement Committee there was a discussion of a possible tour in the Upper Division to take place in

the current fiscal year. Therefore, he made a motion to amend the FY 2016 budget by adding \$2,000 for the proposed tour. The motion was approved by the Commission. Millis then made a second motion recommending approval of the 2017 budget as presented, with the option to roll the \$2,000 for the tour into the 2017 budget if the tour date is moved into FY 2017. That motion was also approved.

**IV. 2016 Water Supply Outlook** – Troy Brosten from NRCS Snow Survey gave a presentation on the water supply outlook for 2016. He reported that as of April 1<sup>st</sup>, the snowpack for the Bear River was about average, compared to around 50 percent of average the previous year. Reservoir storage was down a little from the previous year to 44 percent. The snowpack was about 93 percent of normal and precipitation was 99 percent of average. Soil moisture was showing about 78 percent of normal. Brosten then showed graphs of snowpack and stream flow forecasts at several locations throughout the basin. He reported that the weather forecast showed a three-month outlook with above normal precipitation which could prolong the runoff period and improve the reservoir numbers. Brosten’s presentation is attached in Appendix D.

**V. Utah’s Bear River Comprehensive Management Plan** – Laura Ault from Forestry, Fire and State Lands addressed the Commission, reporting that Utah is embarking on a first-ever Comprehensive Management Plan (CMP) for the Bear River. She explained that they create a management plan to guide the implementation of management objectives and provide direction for land-use decisions and activities on sovereign lands. As part of this plan, they will do an assessment of the conditions on these lands and then classify the different areas of the river, which will help to streamline the lease process. Ault explained that if anyone wanted to put anything on the river, such as an irrigation pump, a bridge, a utility, etc., they would have to have a lease from the State of Utah. With the CMP, they will be able to determine best management practices for different kinds of projects and create a list of potential future projects.

In answer to a question about existing pumps or diversions, Ault commented that probably 95 percent of existing pumps and structures do not have permits. They would like to get all of those under compliance over the next few years. The reason for this is if someone is benefiting from public land, there needs to be compensation to the State, which is usually a couple hundred dollars for a multi-year permit. She explained that it was very unlikely that an existing use would be denied. Ault stated that it was not necessary to wait until the CMP was completed to start the lease process.

Carly Burton with Bear River Water Users Association expressed concern for those in the Bear River Small Pumpers Association, numbering over 100 people. He asked if these people who have small pumps which they have been using for decades would have to get a permit to continue using their pumps. Ault responded that they would need to get a permit, but that it was an easy process. The permit would outline certain rules to be followed and they would need to make sure they have a water right with that permit. The permits could be for anywhere from 5 to 30 years with a one-time fee. They try to make the process as painless as possible under their mandate to benefit the public trust.

Ault explained the timeline for this CMP. There will be a kickoff at the end of April and then public scoping meetings where everyone has a chance to comment on what they would like to see in the plan. They will meet with the municipalities and stakeholder groups to get their feedback. They will then draft the plan and have additional public comment before the plan is finalized. Ault indicated that they would like to have a member of the Bear River Commission involved on the Planning Team, along with representatives from Water Rights, Water Resources, State Parks,

Wildlife, Water Quality and others. Additional information is available on their website at forestry.utah.gov.

Ault's presentation is included in Appendix E.

**VI. Revisions to the Commission's Depletions Estimates Procedures** – Don Barnett reminded the group that the Commission had assigned the TAC to take on three areas to better streamline and unify in the ability to come up with depletion estimates. These areas include municipal depletions, an update in the crop mix and ET values and an update in the process for estimating depletions associated with supplemental water supplies. He noted that the TAC was ready to report on two of the items.

Regarding municipal depletions, Barnett noted that Memorandum 2016-12 provided a report as to the activities of the TAC in this area. The memorandum included a red-line version of the procedure with suggested changes (see Appendix F). These changes would provide a unified way to identify a per capita depletion. Then, in the future, the states would identify the change in population served by public water supply agencies since January 1, 1976, within the various divisions of the Compact and report those by multiplying by a uniform per capita depletion rate of 0.11 acre-feet per person. This was the recommendation of the TAC. A motion was made to accept these changes as presented by the TAC for the municipal depletions portion of the procedures. The motion was passed by the Commission.

Barnett moved to the second item involving an update to the crop mix and ET rates used for depletion estimates. Memorandum 2016-13 provided a recommendation from the TAC regarding changes to procedures dealing with crop mix updates. These changes were also shown in a red-line version of the procedures attached to the memo. Barnett mentioned that during the Operations Committee meeting, there were three additional suggested changes. These changes are shown in yellow highlighting on the red-line document (see Appendix G). Barnett reviewed the additional changes with the group. He noted that there were also suggested changes to the table in Appendix B. He explained that the table was previously attached to the depletion procedures and provided all of Dr. Hill's data from the 1970s to the 1980s. It is no longer necessary to include these data because there is now an average ET rate that came out of work recently completed by Utah State University. Therefore, all that data would be deleted, leaving just the bottom line with the updated depletion rates determined by the TAC. There was an additional suggestion for clarification to the title (see Appendix H). A motion was made to adopt the proposed amended procedures with the changes under sub-paragraph "A. Irrigation Depletion," along with the changes to Appendix B. The motion carried.

Appreciation was expressed to the TAC for all their efforts on these procedures.

**VII. Bear River Compact 101 – Bear Lake Levels** – Don Barnett shared with the group some basic information regarding elevations at Bear Lake (see Appendix I). He noted that Utah Power & Light established a datum associated with Bear Lake long ago, which became the datum to be used according to the Compact. This UP&L datum is about 2.75 feet higher than the last survey that was run there, so it is important to those who might be investigating or talking about Bear Lake or Mud Lake to understand that all references are to the UP&L datum. Barnett noted that the bottom of the reservoir is at 5,902 feet and when full, it would be at 5,923.65 feet. He also explained that in the Original Compact, the definition of Bear Lake specifies that Bear Lake means Bear Lake and Mud Lake.

The Original Compact identified more than 14,000 acre-feet of existing reservoirs above Bear Lake in 1955. It identified those reservoirs by state and allocated storage in those reservoirs that predated the Compact. Therefore, their storage and operations remain unaffected by the Compact. There was then allocated an additional 36,500 acre-feet of Original Compact storage. Of that allocation, Idaho received 1,000 acre-feet and Utah and Wyoming split the remaining 35,500 acre-feet. Limits were placed on this storage that it was not to impact existing direct flow rights in any division of the river and that it was not subordinated to Bear Lake or other downstream storage. However, those who were dependent upon Bear Lake were concerned about the impact this additional upstream storage would have on the water supply within Bear Lake. To avoid injury, an Irrigation Reserve was established below which UP&L could not release water simply for power purposes, which would provide protection in critically dry years. The Irrigation Reserve is tied to the 36,500 acre-feet of storage, which is not all built out, so the level increases with time as upstream storage is established. The Commission is to track upstream storage construction under the Original Compact storage allocations and publish it. A list of reservoirs which have received Original Compact storage allocations is included in the Commission's Biennial Reports, which presently adds up to 31,000 acre-feet of completed storage and an Irrigation Reserve at an elevation of 5,914.61 feet.

There was one change made in the 1980 Amended Compact, which allowed for an additional 74,500 acre-feet in upstream storage reservoirs, with an allocation of 4,500 acre-feet to Idaho and 35,000 acre-feet each to Wyoming and Utah. At the time, there was again concern expressed about impacts to Utah Power & Light and downstream water users. Different limits were placed on these storage rights. Again, it was subordinated to direct flow water rights in any division; but in addition, storage was not allowed if Bear Lake was below 5,911 feet. Also, it did not allow any more than 28,000 acre-feet to be depleted above Bear Lake, with 2,000 acre-feet of that depletion allocated to Idaho, and 13,000 acre-feet each to Wyoming and Utah.

Barnett then explained flood operations at Bear Lake. Utah Power & Light was sued several times in the 80s and 90s as it had operated the lake to maximize the amount of storage and hold as much water as possible. When suddenly a large amount of water came to Bear Lake, releases by Utah Power & Light caused some downstream water users to claim that they had been damaged. As a result, Utah Power & Light developed an operating plan to protect itself. By March 31<sup>st</sup> each year Utah Power & Light would have the reservoir down to an elevation somewhere between 5,920 feet and 5,916 feet, with a midrange target of 5,918 feet. The elevation would be adjusted within this range according to expectations of a wet or dry year. An agreement was signed in 1999 between the states and PacifiCorp memorializing this operating agreement.

Barnett then addressed the subject of Bear Lake/Mud Lake Equivalency. As specified in the Original Compact, Bear Lake means Bear Lake and Mud Lake. Initially there was only Bear Lake and Mud Lake, but with time a wildlife refuge was developed in the area. For the good of wildlife, there was a desire to hold Mud Lake at an elevation higher than Bear Lake and not let the two reservoirs equalize. There were concerns expressed by upstream water users about their water rights being honored. Consequently, in 1995 the Commission adopted a procedure for Bear Lake/Mud Lake equivalency. The procedure allows for holding back water in Mud Lake, but at the same time equalizing both lakes mathematically, not physically. The Commission created a chart which adds the contents in Mud Lake to the contents in Bear Lake and calculates an equalized elevation to be used for management. So if Mud Lake were to be held at an elevation of 5,920 feet, which is good for nesting, it would mean that Bear Lake would actually reach an equivalent elevation of 5,911 feet about 0.12 feet before it physically gets there. This means that if Bear Lake were filling at a rate between .01 and .02 feet per day, it would allow upstream water users to begin

storage 6–12 days earlier. This could be important because it may be the only time that peak runoff is available to those upstream reservoirs during a critical period under Amended Compact storage allocations. Barnett noted that Connely Baldwin had made an improvement on the old table which can be found on the Commission's website under real-time gaging information by going to "Reservoirs" and then to the "Bear Lake area." It shows the elevations for Bear Lake and Mud Lake, with the equivalent elevation to the right. It may be that watching these numbers on a daily basis will show when Woodruff Narrows and Sulphur Creek Reservoirs are allowed to store under their Amended Compact storage allocations.

Barnett then spoke of the Bear Lake Settlement Agreement, which came out of a lawsuit about operations at Bear Lake. The Agreement originated in 1995 and was amended in 2004. There were concerns about the operation of the lake and the effect on local environments around the lake, as well as concerns by downstream irrigators regarding the amount of water they contracted for and the utility of that water. Ultimately this led to a three-party agreement between the Bear River Water Users, PacifiCorp and the Bear Lake interests. According to the Amended Settlement Agreement, each year as Bear Lake begins to fill, they look to the magical date of the April 1<sup>st</sup> streamflow forecast. From that forecast, PacifiCorp projects what they believe will be the high elevation in Bear Lake for the summer. With this projection, there is a table which specifies the allocation given to the water users which they divide amongst themselves as to how much water they will receive. This allocation drops as Bear Lake drops, thereby preserving water in Bear Lake for Bear Lake recovery. This is one more item that is considered in the operation of Bear Lake.

Appreciation was expressed to Barnett for his presentation. It was suggested that it might be helpful if the slides were circulated to the group.

As part of the Commission's break, Pat Tyrrell made a presentation honoring Sue Lowry who was retiring. He reported that over the many years Lowry has worked in the Wyoming State Engineer's office, she has been the point person for most interstate issues, but she had a particular fondness for the Bear River and working with the Bear River Commission. Tyrrell offered a Resolution of Appreciation for Lowry recognizing her great contributions over her 28-year association with the Commission. This resolution was approved and signed by the Commission.

**VIII. Records & Public Involvement Committee report** – Curtis Stoddard asked Liz Cresto to share from her notes the discussion items from the meeting of the Records & Public Involvement Committee. Cresto reported that Jack Barnett shared some old newspaper articles of interest which they intended to post on the Commission website. Regarding stream gaging, the USGS reported that there will be no increase in stream gaging costs for 2016, but it will increase by 1.25 percent in 2017. The water quality agencies will continue to participate in funding of the gages. There are a handful of new real-time gaging stations being installed throughout the Basin. There is a proposed erosion project at the East Fork Hilliard that may have impacts to the downstream gage. It seems to be moving very slowly, so they will keep an eye on the project.

Cresto reported that Kevin Payne has been able to make some modifications to the real-time website and is willing to help in the future, if needed. Jack Barnett is still working on the real-time gage report. Don Barnett reported that the 2015 chapter of the Biennial Report has been drafted. It will be sent out to the group for review.

Stoddard added that the committee discussed a possible tour of the Upper Division to be held in June 2016 or in 2017. The Commission was in favor of such a tour, and it was noted that an amendment was made to the budget in the amount of \$2,000 to cover expenses for the tour.

**IX. Operations Committee report** – Chairman Francis reported on the discussions at the Operations Committee meeting. He commented that as they discussed river operations for 2016 in each of the divisions, they were expecting an average year for water and were looking to keep the spirit of cooperation going between the divisions. They expected that some divisions may go into regulation, but didn't think it would happen in the Upper Division due to good water storage. They then discussed depletions methodologies and changes to procedures, as had been previously discussed in the Commission meeting.

Regarding the Malad River development which runs through Idaho and Utah, Francis reported that Idaho currently had a moratorium on development in that area. Utah started a study there in 2012, the results of which have not yet been presented, but the current consensus is that there is also a moratorium in Utah for new development above the single household level. Francis also reported that there had not been much activity in new water use proposals of interest.

Connely Baldwin then reported on PacifiCorp operations. His handout is included here as Appendix J. He reported that the Bear Lake Outlet Canal was opened on May 1, 2015, but was shut a week later due to increased flow from rainfall. It was opened again on June 13<sup>th</sup>. This delay increased the amount of water for Bear Lake recovery. Baldwin reported that Bear Lake was currently at 5,912.74, which is about 47 percent of maximum volume. He reported that the causeway and the Outlet Canal were currently closed due to a request from the Refuge to adjust the elevation in Mud Lake to allow for a controlled burn at one of their units later in the fall. He also reported that the anticipated spring maximum elevation of Bear Lake was 5,913.8 feet, with the declaration of a Bear Lake storage irrigation allocation of 224,000 acre-feet. Baldwin noted that on the back of his handout there was a history of the allocations made under the Bear Lake Settlement Agreement. He pointed out the total savings from the Bear Lake Settlement Agreement at 520,000 acre-feet and the total irrigator savings of 1,400,000 acre-feet, which coincidentally is the volume of reservoir storage on Bear Lake.

Regarding FERC license operations, Baldwin reported that the Environmental Coordination Committee continues to meet and make grants for habitat restoration projects for Bonneville Cutthroat Trout. Recreational flows through the Grace bypass reach are still occurring. He also noted that PacifiCorp is coordinating with Last Chance Canal Company on some restricted operations as they do some rebuilding at the headwaters of Last Chance Dam and the Last Chance hydroelectric plant.

**Water Quality Committee report** – Walt Baker gave a report on the highlights of the Water Quality Committee meeting held the previous day. He reported that ten years ago the three states embarked on a monitoring initiative to more efficiently use the resources in a cost-effective manner. This five-year effort extended to ten years. In assessing whether or not to continue this effort, Wyoming determined that they needed to back out and focus on some higher priorities for a while. Idaho and Utah will strike another agreement to continue the effort, leaving the door open for Wyoming should they decide to join in again in the future.

Jeremy Jirak, Manager of the Bear Lake National Wildlife Refuge, gave an update on the activities at the Refuge. Of particular interest was a study being conducted to look at the wetlands as a habitat and how they can be improved and maintained. For the first time there is a full-time biologist dedicated to the refuge, which is a good thing.

Dr. Pat Belmont at Utah State University gave a very interesting presentation to the Committee on a sediment study that is being conducted at Mud Lake and Bear Lake.

Baker shared some information from reports on water quality in each of the states. Idaho provided an update on its five-year TMDL review on reaches of the Bear River. Idaho continues to pursue delegation from EPA for the NPDES permitting program. It is one of only four states in the country that have not been so delegated. Utah made a presentation on a four-year nutrient study on Willard Spur where a new waste water treatment plant has been constructed. With the spur just south of the wildlife refuge, they were concerned about the effect of nutrients on the wetlands. The results of this study will be presented to the Water Quality Board in a month. The spur is in good shape, except for low flow times three months of the year, during which time they remove nutrients. This has turned into a win-win situation for the waste water treatment plant, the communities in the area, and the ecosystem of the State. Utah also made a presentation on a forthcoming listing on their impaired water list, which all states are obligated to provide to EPA every two years. On the 2016 list will be Farmington Bay, impaired because of violations of the standard that protects recreational uses on the lake. This pertains to harmful algae blooms which can pose public health problems and recreational problems, impairing the ability to use those natural resources. They plan to undertake some studies to understand the source of these harmful algae blooms and how they can be controlled. Wyoming reported that their Bear River TMDL will be approved in 2016. The impairment associated with that TMDL is sediment and habitat modifications.

Baker shared an item of interest that was not addressed at the Committee meeting due to lack of time. He explained that in June Utah will present to the Water Quality Board a project which will call for the extension of the sewer line, which now only extends to the south shore of Bear Lake, around on the east side heading to the north, hoping eventually to go all the way to the Idaho border. This will remove septic tanks from around the lake. Idaho has had ordinances in place that don't allow those, and Utah is trying to catch up with them.

**XI. Management Committee report** – Gary Spackman noted that the Management Committee had spent the majority of their meeting time on a discussion of the depletion updates. He expressed the sentiment of the Management Committee recognizing the great efforts of the TAC with respect to these depletion proposals. With respect to the municipal and the crop use of depletions, they appreciated that the TAC was able to find and identify ways to simplify the computations based on very good data and identify a process that can be employed, which is easily repeatable over time. The Management Committee also talked about a time period or interval when they might ask for a repeat computation and a repeat analysis because of the ability to simulate what was done without a lot of additional effort. They considered the possibility of 2019 because it would be the next deadline on the ten-year interval for looking at depletions. However, they were reluctant to set any kind of deadline because there was one more element in the depletion analysis that had not yet been resolved, regarding depletions for supplemental water use. Spackman noted the time and energy of the TAC in pursuing this particular matter, which had been very difficult to resolve. He expressed the opinion of the Management Committee that, despite any monetary, legal and procedural constraints, it would be a matter of priority for the TAC to continue working on this part of the depletion analysis to find a method that will work. They determined that there should be a series of meetings in which the Management Committee might participate more actively and listen to the discussions that are ongoing inside the TAC so they could gain a better understanding of the difficulties and perhaps contribute somewhat to finding a solution. He noted that a conference call meeting was tentatively scheduled for May 23<sup>rd</sup> at 1:00 p.m. which would include the Management Committee and the TAC. They hope through these meetings the group might find a reasonable solution and consistency in determining the depletions for supplemental use.

**XII. Engineer-Manager's report** – Don Barnett had one item to report in addition to what had already been discussed. He had received a call from Bob Barrett, Manager of the Bear River Migratory Bird Refuge, who wanted to report to the Commission that they had received funding for their watershed project where they were seeking to be able to buy conservation easements within the Bear River Basin for wildlife, and they are moving ahead on that project.

**XIII. State Reports – Idaho** – Gary Spackman reported on Idaho's proposal for an adjudication of the water rights authorizing diversions from the Bear River and tributaries, including groundwater. He noted that at the time of the last report to the Commission in November, he had felt that approval was imminent. In his discussions with concerned legislators that reside in the area, they were supportive and agreed that there would be a legislative initiative, as well as financial appropriations to support the adjudication in the Bear River. Even as late as the end of January, when he appeared before the Joint Finance and Appropriation Committee for the Legislature, Marc Gibbs, who previously served as a Bear River Commissioner and was now a vice chairman on the House side of that committee, made the statement that there would likely be a trailer bill for appropriation of money to finance the Bear River adjudication. So Spackman thought everything was moving forward, but somewhere in the meantime there were discussions going on between legislators and water users and the water users association that resulted in the two legislators deciding not to move forward again this year. Spackman was disappointed in that decision as he feels that it is important that the water rights be adjudicated so they can be administered properly and so the water users can have the security of ownership that is necessary and that is created by adjudicating water rights.

Spackman reported on two other matters related to court cases or challenges in the State Legislature that could affect his job and the interpretation of the Director's discretion to act. One of them was a court case for a delivery call outside the Bear River. They were employing a groundwater model which showed that for certain remote diversions of groundwater, the impacts to the particular springs and the water rights that authorized diversions from those springs were very small and yet there was a threat of curtailment of all of those water rights. So, both in timing and quantity, the impact of the groundwater diversions was very small. The District Court ruled that it didn't matter how small they were if there was an impact and that amounted to the curtailment of about 300,000 acres of irrigated land for a net benefit of 1.5 cfs of additional water to the springs. The Supreme Court ruled that the Director had the authority under the constitution and under water law and had the discretion to decide based on those kinds of factors. It wasn't a determination of futile call; it was a determination of a little bit of balancing where it acknowledged the responsibility of the Director to maximize the beneficial use of the waters in the State of Idaho. So if he feels that the impacts are very remote and small, he has the ability and discretion to disregard those impacts.

The other item had to do with an ongoing dispute with some water users in the state over the refill of reservoir rights. Outside of the legal challenges involved, Spackman has been dealing with legislative assaults on attempting to limit his authority. In one case, there are folks who have said that the Director has too much authority and too much discretion and shouldn't be able to make these kinds of decisions, which are decisions about when a water right is satisfied. These aren't decisions about whether somebody should be able to have a water right, but rather decisions on the ditch bank about whether a water right is satisfied or not. They are talking about stripping some of that authority away. Spackman said he didn't know if that would happen, but it is an interesting discussion. So, if some of the legislators got what they wanted, Josh Hanks could be out on the ditch bank and, based on Spackman's instruction, shut somebody off or limit them. In this case,

Spackman would ultimately not be the fact finder, but rather it would go to an independent hearing officer immediately. This would be a large intrusion on what the water manager in the state has done for a long time.

Chairwoman Williams asked Spackman if he could supply the citation to the case on impairment for those who were interested.

**XIII. State Reports – Utah** – Eric Millis shared some additional information on Utah’s proposed Bear River Development Project. This project would still be 20-25 years away, but there had been a significant amount of discussion about it in the past year, perhaps prompted by recent events such as the north arm of the Great Salt Lake hitting a record low recently. Also, about a year ago, an audit was released that dealt with the State’s water data which included a number of recommendations. In addition, there was an emphasis on carefully reviewing all the aspects of any large project to make sure that everything is being done to meet future water needs. Of course, Utah has been promoting water conservation for 25-30 years now in the conversion of agricultural water as farmlands are sold to developers, as well as in the big projects. So the audit recommended a lot of conservation measures. These things were also included in discussions in the legislature, and the legislature passed several bills related to this and other things water resource related. There was some money set aside for big projects, such as the Bear River Development Project, which would be ongoing funding. There was also some direction to work with the State’s Water Development Commission and also the legislative management committee and the governor’s office to ensure that certain things are being satisfied such that projects move forward. Millis reported that they had started discussions with a number of the stakeholders who had asked to be more involved with the planning of this project. This included the mineral companies, the brine shrimp industry, and environmental groups. He felt that a lot of this was coming from the environmental groups and that there were a lot of passionate people who would say we should never develop any more water in the State of Utah and that we ought to live within the means that we have. Millis noted that Utah is expecting a huge population growth and that you just can’t meet the future needs with conservation alone. So they are looking at all of these recommendations and working with the legislature and the governor’s office. They feel that this project would be a good option for the future and that they need to continue planning for it and taking appropriate steps along the way.

**XIII. State Reports – Wyoming** – Sue Lowry mentioned a couple of activities that the Wyoming Water Development Commission is conducting in the Bear. They have begun what they call their “watershed studies,” taking a look at a smaller scale down from the bigger river basin plans. Once some of the smaller scale needs are identified, then some of those land owners can become eligible for additional funding. This funding would come through the Wyoming Water Development Commission which gets its funding from an earmark on severance from coal, oil and gas. Lowry mentioned that a water user update meeting on the Bear was being held the following day for any who would like to attend.

Speaking of the severance earmarks, Lowry reported that those dollars continue to decline in an energy-dependent state like Wyoming. They are not in very good shape financially, and this was the main point of discussion during the legislative session. State agencies across the board will take a hit to their travel funds and their contracting dollars. There is a general hiring freeze, but exceptions are made by presenting your case before a panel. She noted that Pat Tyrrell was successful in his effort to refill her position and that job announcement ought to be out soon, with the hope that the position can be filled before she leaves on June 2<sup>nd</sup>.

**XIV.A. Activities of the Bear River Water Users Association** – Carly Burton began by stating that he was going to be cautiously optimistic about the water supply this year for a number of reasons. He thought it was the best snowpack since 2011 and that Smiths Fork was looking good as far as runoff. Woodruff Narrows was almost full, so once that fills, water coming down that is not diverted will be able to be diverted into Bear Lake. He noted that the Tony Grove station was at 103 percent, and he was encouraged by the good snow pack in the Logan which meant that PacifiCorp wouldn't have to start making storage releases out of Bear Lake as early, which means savings that will domino all the way back up the river.

Burton noted that if you add irrigator savings for the last two years from Connely Baldwin's chart, you get 260,000 acre-feet, which is greater than the allocation for this year alone. So it kind of brings back the importance of the Bear Lake Settlement Agreement. The allocation schedule in the Agreement and the water preserved for Bear Lake recovery really emphasize conservation. He felt that the conservation awareness is greater than it has ever been.

Burton gave an update on the negotiations with Nibley City. He reported that agreements were reached last month between Nibley City, Cache County, PacifiCorp, Bear River Water Users Association and College Irrigation Company on change applications that were filed by the city to divert water from city wells. Those agreements allow the city to develop water supplies for future growth and provide a mitigation plan to protect the downstream rights under the terms of the Cache Valley Groundwater Management Plan. He noted that there was a lot of work and expense involved in those negotiations, and he hoped that those agreements that will be incorporated by the State Engineer in the approval process will serve as a template for future development and future growth in Cache County.

Burton again expressed his concern about Utah State Land's Bear River Comprehensive Management Plan and indicated that he would be watching this closely and report on what he finds out.

**XIV.B. Bear Lake Watch** – Claudia Cottle again expressed appreciation to the group for their support of the celebration of the Bear Lake Settlement Agreement that took place at the Bear River Migratory Bird Refuge the previous year. She reported that another anniversary was coming up. She referred to the first draw-down from Bear Lake that took place in 1916, which makes 100 years of using Bear Lake as a reservoir. We think about the last 100 years of using Bear Lake and what has happened since then. A few of those early people had a vision of what could be done to improve the lives of the people in the Intermountain West with a power project and irrigation project. This was a tremendous project which put Utah and Idaho on the map with that power generation. She felt those efforts were to be applauded. She felt we should also be bold in looking forward to the next 100 years as great changes come to irrigation and agriculture. She hoped the group would be able to guide those changes to make Bear Lake and the Bear River system even better. She explained that they would be holding a meeting on May 5<sup>th</sup> called "Banquet and Banter" that would provide an opportunity for people to eat and discuss with some legislators and Bear Lakers a direction for the future.

There was no public comment.

**XV. Next Commission meeting** – Chairwoman Williams announced that the next Bear River Commission meeting was scheduled to be held on November 15, 2016. Sue Lowry brought up that Wyoming would have a problem with that week. Utah could also foresee a conflict with that date. As the group reviewed their calendars, it was determined that they would move the Commission

meeting to Tuesday, November 22, 2016. The change in date was approved by motion of the Commission. Don Barnett indicated that he would contact the Water Quality Committee to see if they wanted to keep their meeting on November 14<sup>th</sup> or move it to November 21<sup>st</sup>, to be the day prior to the Commission meeting. The Commission meeting was then adjourned.

# **ATTENDANCE ROSTER**

## **BEAR RIVER COMMISSION ANNUAL MEETING**

Utah Department of Natural Resources  
Salt Lake City, Utah  
April 19, 2016

### **IDAHO COMMISSIONERS**

Gary Spackman  
Kerry Romrell  
Curtis Stoddard

### **WYOMING COMMISSIONERS**

Sue Lowry  
Gordon Thornock  
Kevin Payne (Alternate)

### **FEDERAL CHAIR**

Jody Williams

### **UTAH COMMISSIONERS**

Eric Millis  
Charles Holmgren  
Blair Francis  
Norm Weston (Alternate)  
Joe Larsen (Alternate)

### **ENGINEER-MANAGER & STAFF**

Don Barnett  
Jack Barnett  
Donna Keeler

### **OTHERS IN ATTENDANCE**

#### **IDAHO**

Jeff Peppersack, Department of Water Resources  
James Cefalo, Department of Water Resources  
Liz Cresto, Department of Water Resources  
Josh Hanks, Water Master

#### **UTAH**

Kent Jones, State Engineer  
Walt Baker, Department of Environmental Quality  
Will Atkin, Division of Water Rights  
Ben Anderson, Division of Water Rights  
Carl Mackley, Division of Water Rights  
Todd Adams, Division of Water Resources  
Randy Staker, Division of Water Resources

#### **WYOMING**

Pat Tyrrell, State Engineer  
Beth Ross, State Engineer's Office  
Mike Johnson, State Engineer's Office  
Travis McInnis, State Engineer's Office  
Levi Walker, State Engineer's Office

#### **OTHERS**

Connely Baldwin, PacifiCorp Energy  
Claudia Conder, PacifiCorp Energy  
John Mabey, PacifiCorp Counsel  
Cory Angeroth, U.S. Geological Survey  
Troy Brosten, NRCS Snow Survey

Ben Radcliffe, USBR  
Darin McFarland, Bear River Canal Company  
Claudia Cottle, Bear Lake Watch  
David Cottle, Bear Lake Watch  
Carly Burton, Bear River Water Users Association  
Bob Fotheringham, Cache County  
Scott Clark, Barnett Intermountain Water Consulting  
Laura Ault, Utah DNR-Forestry, Fire and State Lands  
Jeremy Jirak, Bear Lake National Wildlife Refuge

**BEAR RIVER COMMISSION ANNUAL MEETINGS**  
**April 18-19, 2016**

**Water Quality Committee Meeting**  
**Utah Department of Environmental Quality**  
**195 North 1950 West**  
**Salt Lake City, Utah**

**All Other Meetings**  
**Utah Department of Natural Resources**  
**1594 West North Temple**  
**Salt Lake City, UT**

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**COMMISSION AND ASSOCIATED MEETINGS**

**April 18**

10:00 a.m.      Water Quality Committee Meeting – Red Rock Conference Room      Burnell

**April 19**

9:00 a.m.      Records & Public Involvement Committee Meeting – Room 314      Stoddard

10:00 a.m.      Operations Committee Meeting – Room 314      Francis

11:15 p.m.      Informal Meeting of Commission – Room 314      D. Barnett

11:30 p.m.      State Caucuses and Lunch      Spackman/Millis/Lowry

1:00 p.m.      Commission Meeting – Main Floor Auditorium (Rms. 1040/1050)      Williams

**PROPOSED AGENDA**  
**ANNUAL COMMISSION MEETING**

**April 19, 2016**

**Convene Meeting:** 1:00 p.m.

**Chairman:** Jody Williams

- |                      |  |                 |
|----------------------|--|-----------------|
| I.                   | Call to order  | Williams        |
|                      | A. Welcome of guests and overview of meeting                       |                 |
|                      | B. Recognitions  |                 |
|                      | C. Approval of agenda  |                 |
| II.                  | Approval of minutes of last Commission meeting (November 17, 2015) | Williams        |
| III.                 | Reports of Secretary and Treasurer                                 | Millis/Staker   |
|                      | A. 2016 Expenditures to date                                       |                 |
|                      | B. Adoption of 2017 budget   |                 |
|                      | C. Other   |                 |
| IV.                  | 2016 Water Supply Outlook  | Brosten         |
| V.                   | Utah's Bear River Comprehensive Management Plan                    | Ault            |
| VI.                  | Revisions to the Commission's Depletions Estimates Procedures      | Barnett/TAC     |
| VII.                 | Bear River Compact 101 – Bear Lake Levels                          | Barnett/Barnett |
| <br><b>BREAK</b><br> |  |                 |
| VIII.                | Records & Public Involvement Committee report                      | Stoddard        |
| IX.                  | Operations Committee report  |                 |
|                      | A. Committee meeting   | Francis         |
|                      | B. Anticipated Operations and Regulation in 2016                   |                 |
|                      | C. PacifiCorp operations   | Baldwin         |
| X.                   | Water Quality Committee report                                     | Baker           |
| XI.                  | Management Committee report  | Spackman        |
| XII.                 | Engineer-Manager's report  | Barnett         |
| XIII.                | State reports  |                 |
|                      | A. Idaho   | Spackman        |
|                      | B. Utah  | Millis          |
|                      | C. Wyoming   | Lowry           |
| XIV.                 | Other / Public comment   | Williams        |
|                      | A. Activities of the Bear River Water Users Association            | Burton          |
|                      | B. Bear Lake Watch   | Cottle          |
|                      | C. Other   |                 |
| XV.                  | Next Commission meeting (Tuesday, November 15, 2016, at Utah DNR)  | Williams        |

**Anticipated adjournment:** 4:00 p.m.

BEAR RIVER COMMISSION

STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF July 1, 2015 to April 14, 2016

INCOME	CASH ON HAND	OTHER INCOME	FROM STATES	INCOME
Cash Balance 07-01-15	110,928.87			110,928.87
State of Idaho			40,000.00	40,000.00
State of Utah			40,000.00	40,000.00
State of Wyoming			40,000.00	40,000.00
Water Quality		2,717.00		2,717.00
Interest on Savings		741.29		741.29
 TOTAL INCOME TO				
14-Apr-16	110,928.87	3,458.29	120,000.00	234,387.16

DEDUCT OPERATING EXPENSES

	APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging/USGS Contract	40,755.00	-	40,755.00
SUBTOTAL	40,755.00	-	40,755.00
 EXPENDED THROUGH COMMISSION			
Personal Services BIWC	63,088.00	10,514.60	52,573.40
Travel (Eng-Mgr)	1,200.00	704.54	495.46
Office Expenses	1,600.00	1,155.77	444.23
Printing Biennial Report	1,000.00	1,000.00	
Treasurer Bond & Audit	1,400.00	1,300.00	100.00
Printing	1,600.00	880.70	719.30
Realtime Web Hosting	8,400.00	1,184.01	7,215.99
Clerical	8,180.00	3,813.91	4,366.09
Contingency	2,000.00	2,000.00	
SUBTOTAL	88,468.00	22,553.53	65,914.47
 TOTAL EXPENSES	 129,223.00	 22,553.53	 106,669.47
 CASH BALANCE AS OF 04/14/2016			 127,717.69

BEAR RIVER COMMISSION

DETAILS OF EXPENDITURES

FOR PERIOD ENDING April 14, 2016

811	STONEFLY	1,800.00
812	processed in previous year	
813	BIWC	10,514.68
814	VOID	
815	STONEFLY	1,800.00
816	USGS	40,755.00
817	BIWC	10,768.38
	bank service charge	59.00
818	VOID	
819	BIWC	5,773.59
820	VOID	
821	BIWC	14,456.02
822	STONEFLY	1,800.00
823	STONEFLY	1,800.00
824	BIWC	5,731.47
825	STONEFLY	15.99
826	BIWC	11,295.34
827	C N A Surety	100.00

106,669.47

BANK RECONCILIATION

Cash in Bank per Statement 04/14/16	15,234.73
Plus: Intransit Deposits	
Less: Outstanding Checks	
Total Cash in Bank	15,234.73
Plus: Savings Account-Utah State Treasurer	112,482.96
	127,717.69

BEAR RIVER COMMISSION

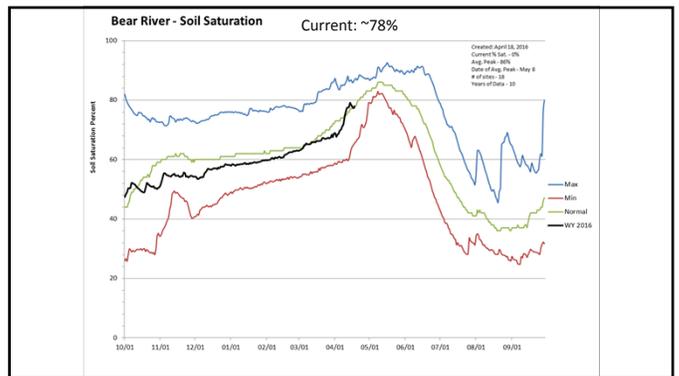
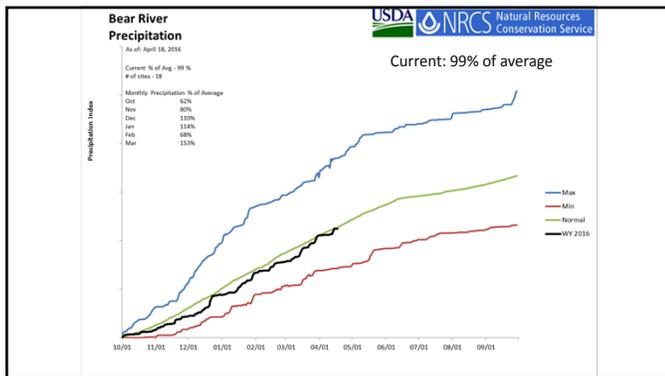
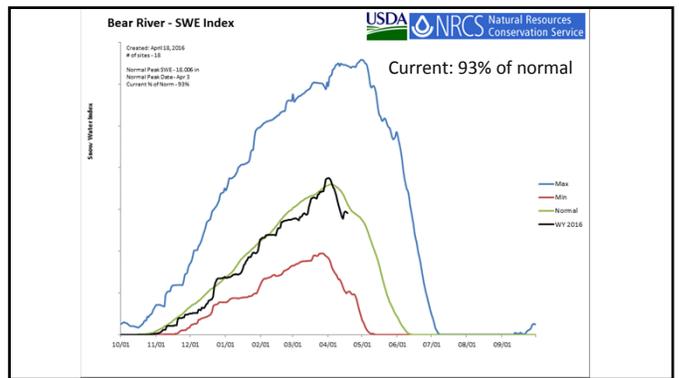
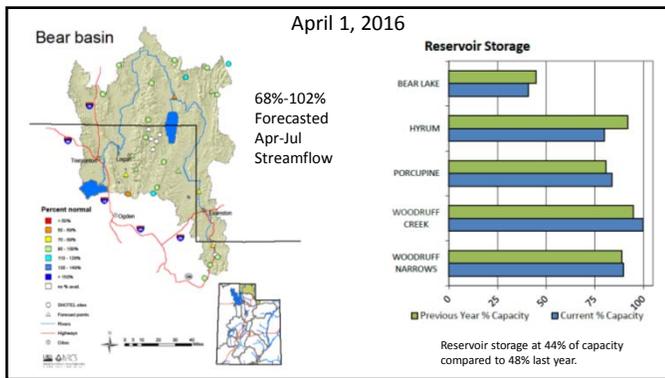
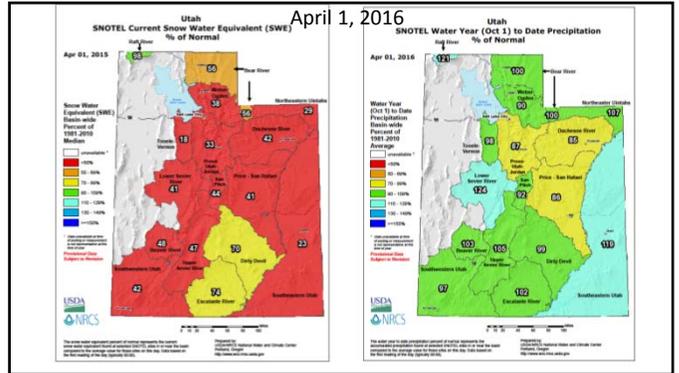
APPROVED BUDGET FOR FY2016 AND PROPOSED BUDGETS FOR FY'S 2017 & 2018

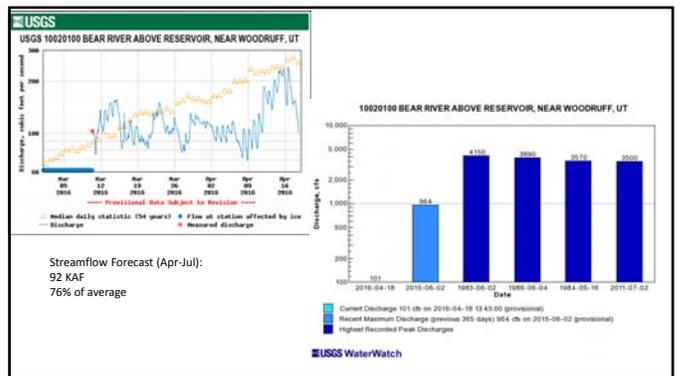
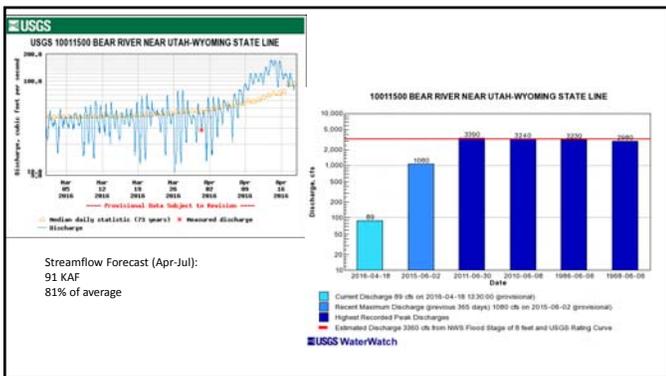
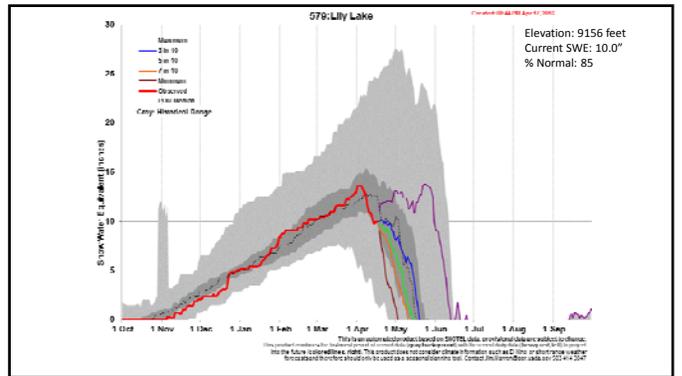
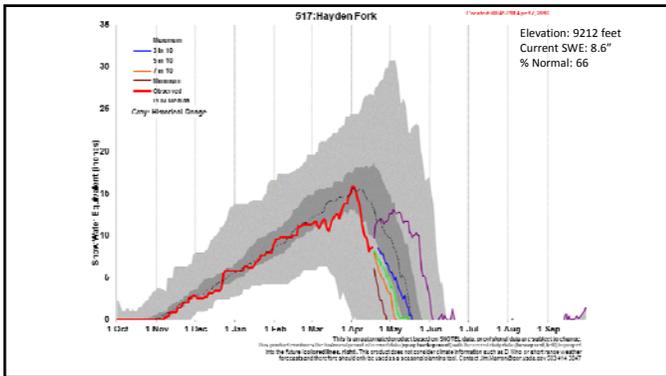
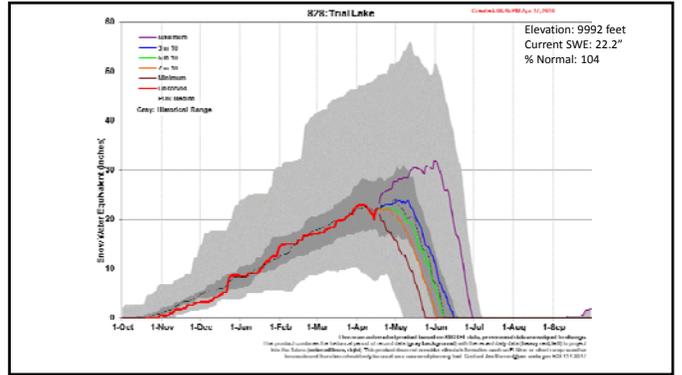
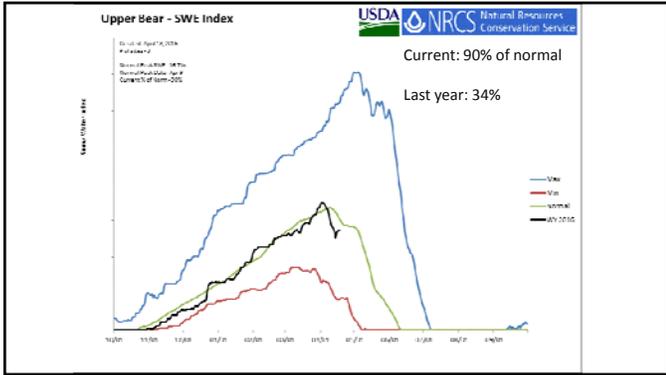
	FY2016 APPROVED BUDGET	FY2017 PROPOSED BUDGET	FY2018 PROPOSED BUDGET
	--INCOME--	--INCOME--	--INCOME--
BEGINNING BALANCE	110,928.87	110,656.87	108,550.87
IDAHO	40,000.00	40,000.00	40,000.00
UTAH	40,000.00	40,000.00	40,000.00
WYOMING	40,000.00	40,000.00	40,000.00
WATER QUALITY	8,151.00	8,254.00	8,254.00
INTEREST ON SAVINGS	800.00	800.00	800.00
TOTAL INCOME	<u>239,879.87</u>	<u>239,710.87</u>	<u>237,604.87</u>
	--EXPENDITURES--	--EXPENDITURES--	--EXPENDITURES--
STREAM GAGING-U.S.G.S.	40,755.00	41,270.00	42,095.00
PERSONAL SERVICES CONTRACT	63,088.00	64,350.00	65,640.00
TRAVEL	1,200.00	1,200.00	1,200.00
OFFICE EXPENSES	1,600.00	1,600.00	1,600.00
BIENNIAL REPORT	1,000.00	1,000.00	1,000.00
TREASURER'S BOND & AUDIT	1,400.00	1,400.00	1,400.00
PRINTING	1,600.00	1,600.00	1,600.00
REALTIME WEB HOSTING*	8,400.00	8,400.00	8,400.00
CLERICAL	8,180.00	8,340.00	8,510.00
CONTINGENCY	2,000.00	2,000.00	2,000.00
TOTAL EXPENDITURES	<u>129,223.00</u>	<u>131,160.00</u>	<u>133,445.00</u>
	<u>110,656.87</u>	<u>108,550.87</u>	<u>104,159.87</u>

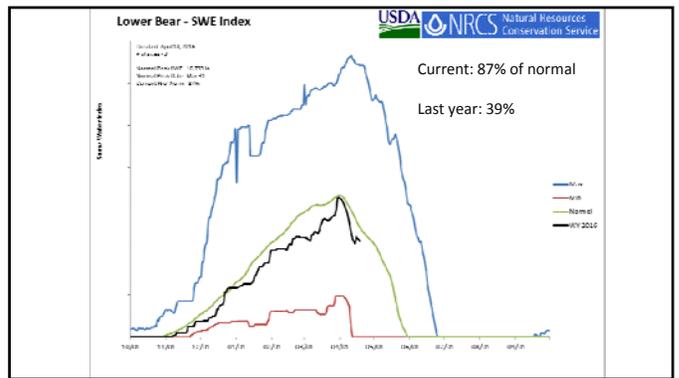
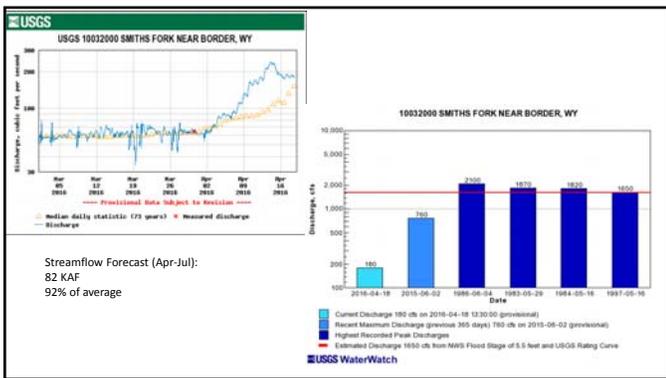
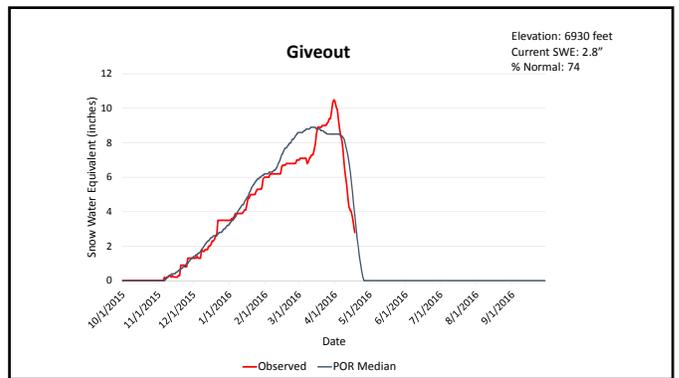
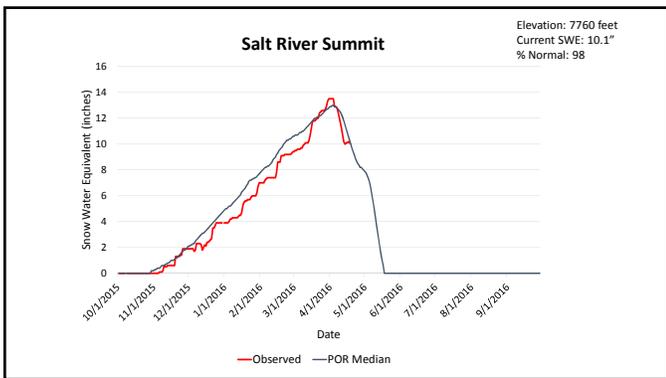
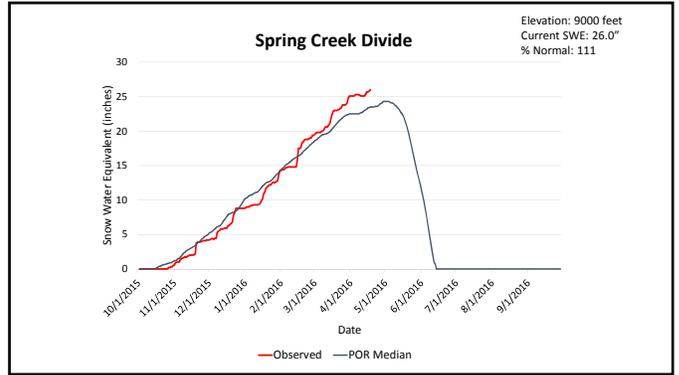
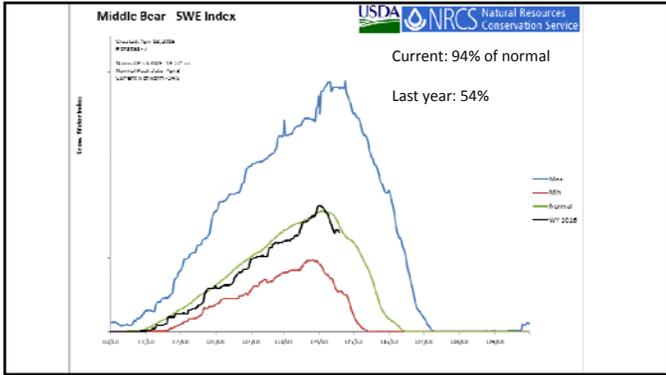
# 2016 Water Supply Outlook Report

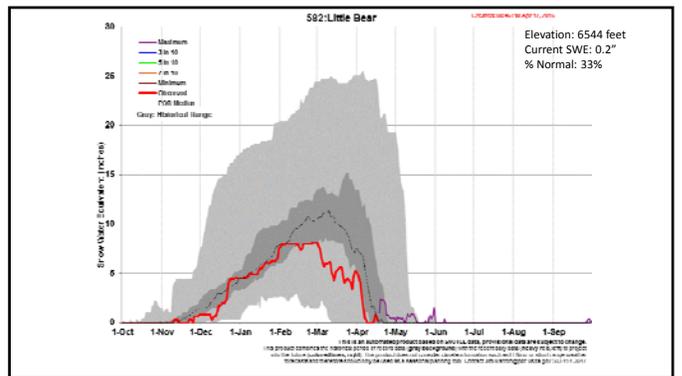
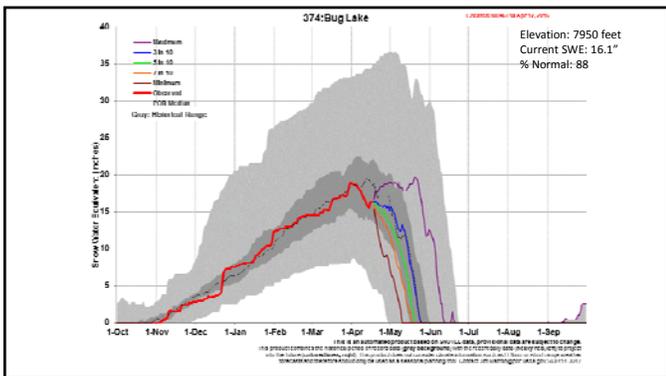
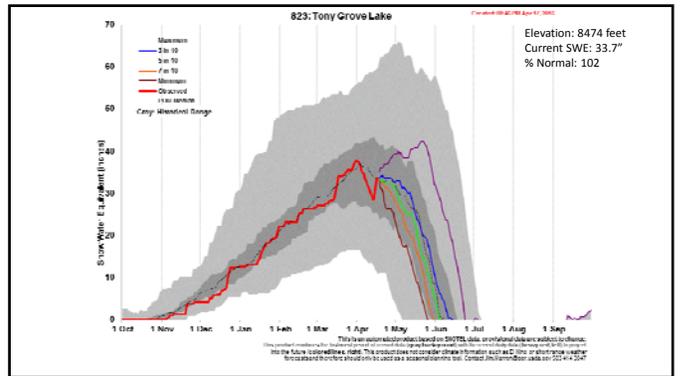
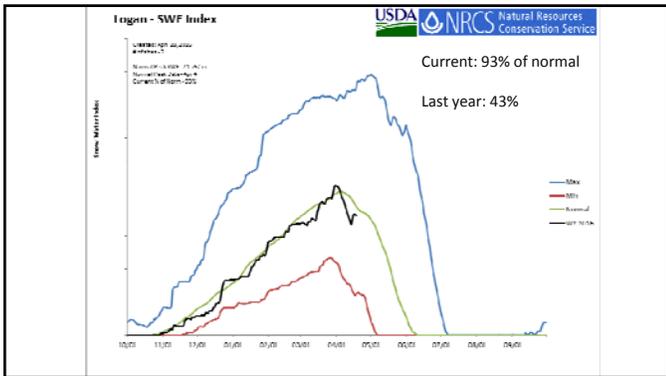
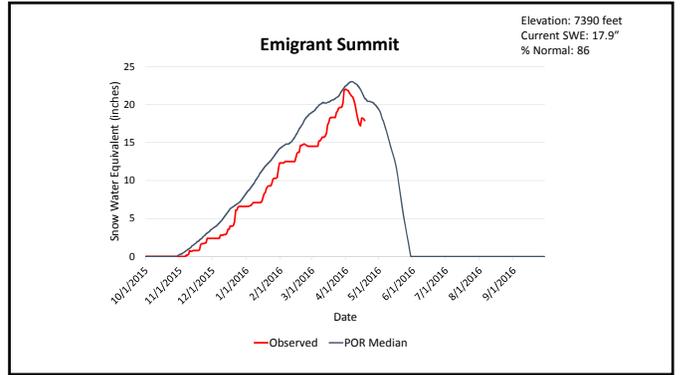
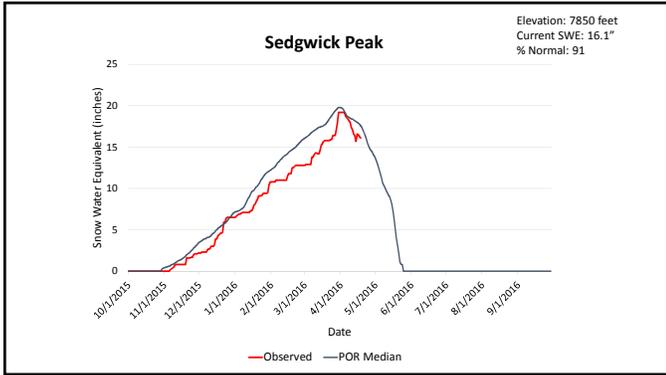
April 19, 2016  
Troy R. Brosten, NRCS/Snow Survey

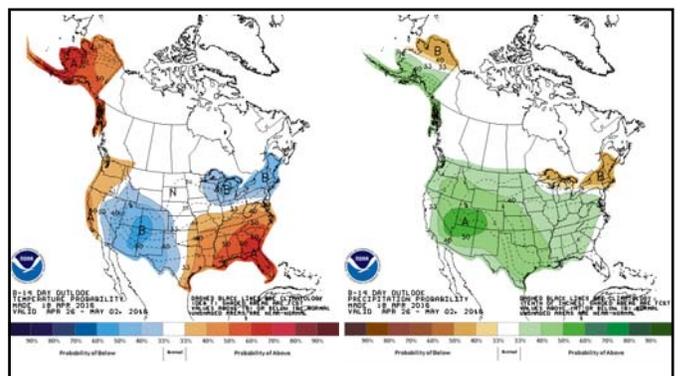
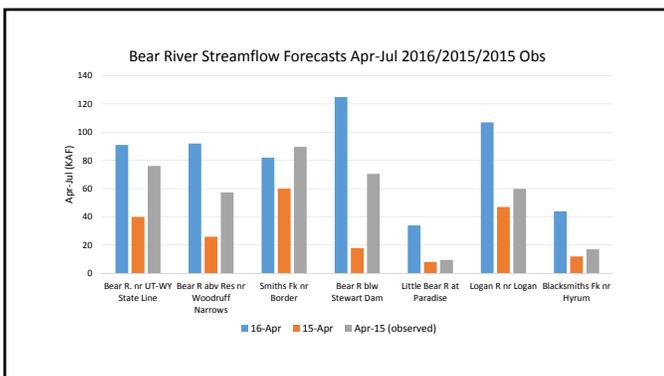
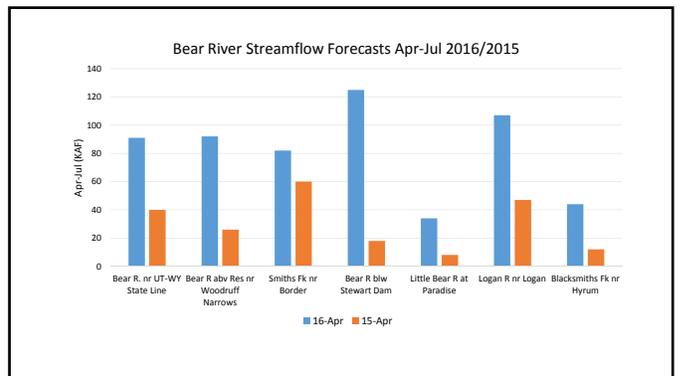
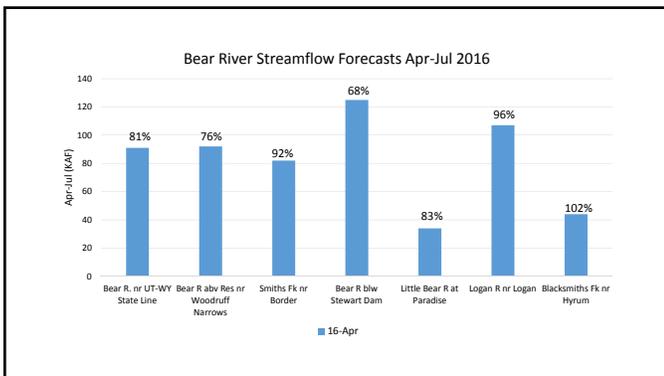
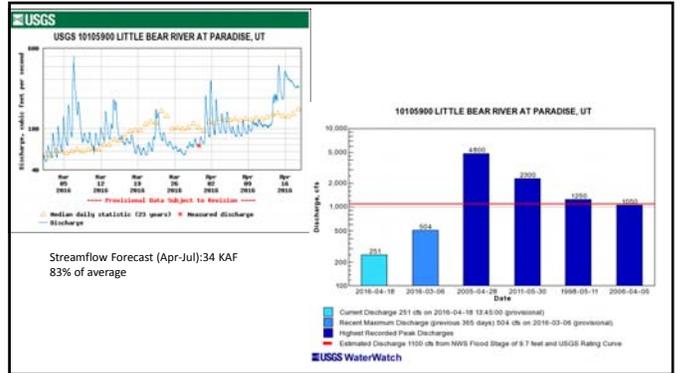
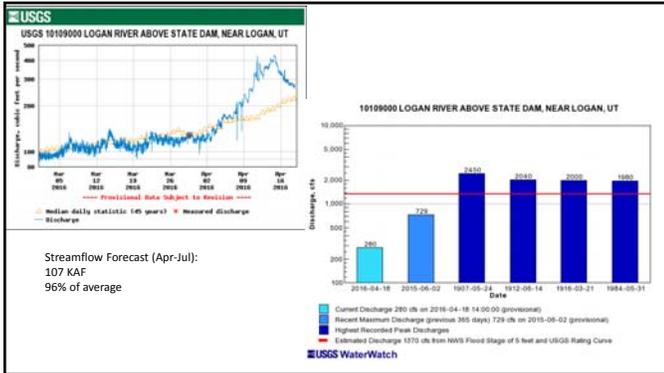
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troy.brosten@ut.usda.gov

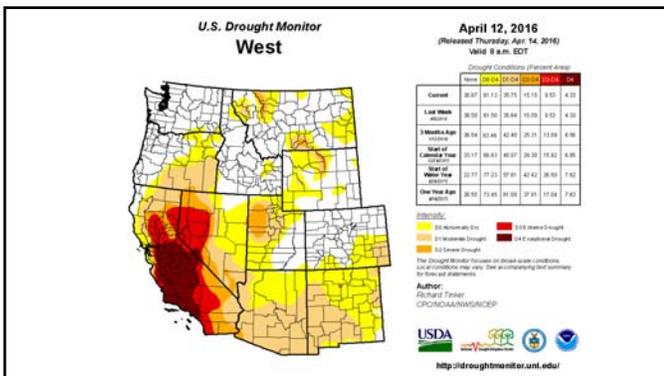
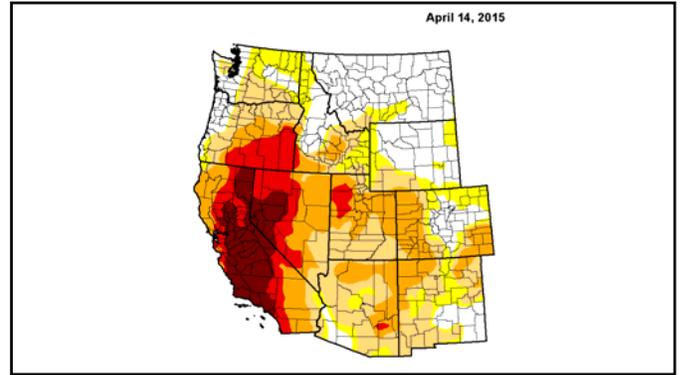
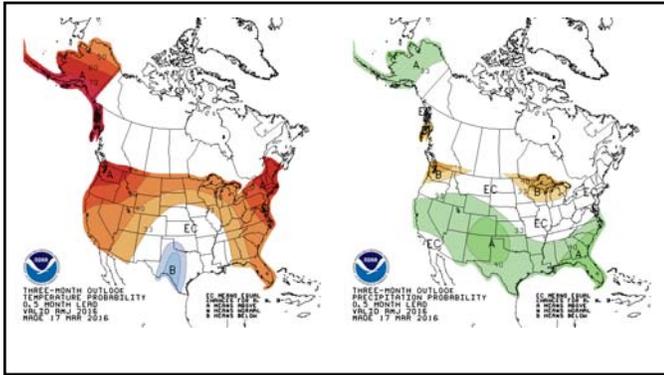












### Summary

- First two weeks of April were, on average 8 deg F higher than monthly March average.
- Reservoir storage at 44% compared to 48% last year.
- Forecasted Apr-Jul streamflow 68 to 102% of average.
- Soil moisture increasing with snowmelt.
- Additional moisture will prolong runoff but not add to snowpack.

### Contact Information

Troy R. Brosten  
 801-524-5213 x111  
 troy.Brosten@ut.usda.gov



**Project Team**

- **Forestry, Fire and State Lands**
  - Laura Ault, Sovereign Lands Program Manager
  - Laura Vernon, Land Use Planner
  - Matt Coombs, Sovereign Lands Coordinator
- **SWCA Environmental Consultants**
  - CRSA
  - Hansen, Allen and Luce



**Public Involvement**

**Multiple Perspectives | Multiple Methods**

Stakeholders

General Public

Municipalities   Focus Groups   Workshops   Open House Series



**Classifications**

- o **Class 1**  
Manage to protect existing resource use options
- o **Class 2**  
Manage to protect potential resource use options
- o **Class 3**  
Manage as open for consideration of use
- o **Class 5**  
Manage to protect potential resource preservation options
- o **Class 6**  
Manage to protect existing resource preservation uses

**DRAFT**

**JORDAN RIVER COMPREHENSIVE MANAGEMENT PLAN**

**CONCEPTUAL RIVER MAP**

Sheet 1: Uses/Features

A - Utilities Above and Below  
B - Navigation Hazard  
C - Industrial Use  
D - Municipal Park  
E - Restoration  
F - Floating Ramp/Dock/Launch  
G - Mitigation of Erosion  
H - Water Quality Monitor  
I - Potential Natural Habitat  
J - Historic Structure  
K - Outfall  
L - Road/Bridge




**DRAFT**

**JORDAN RIVER COMPREHENSIVE MANAGEMENT PLAN**

**CONCEPTUAL RIVER MAP**

Sheet 2: Classifications

**Class 1**  
Manage to protect existing resource use options

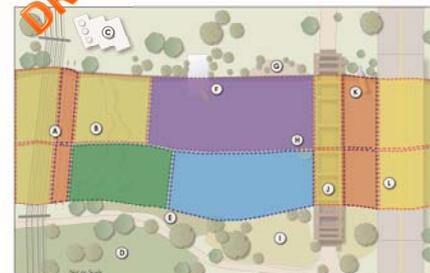
**Class 2**  
Manage to protect potential resource use options

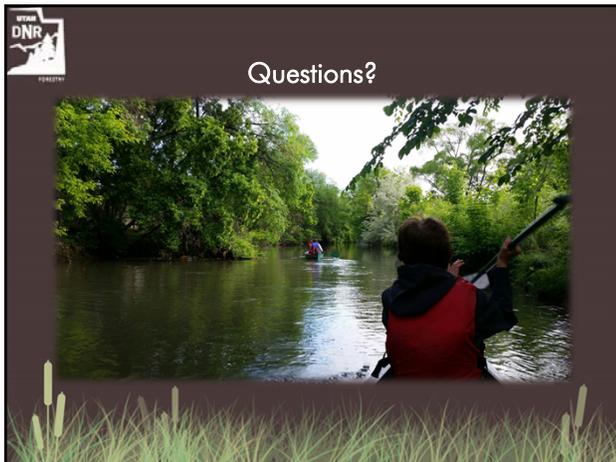
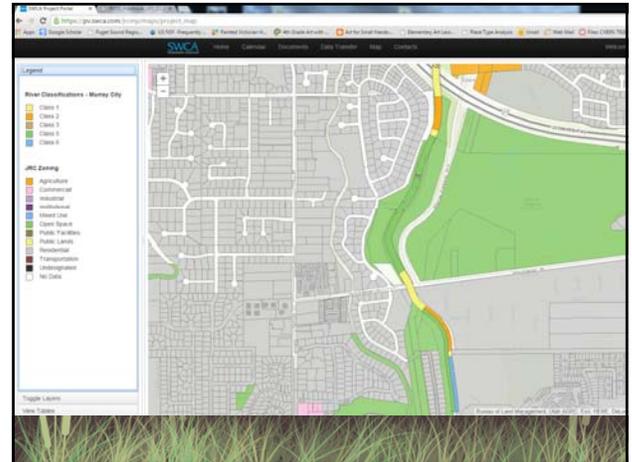
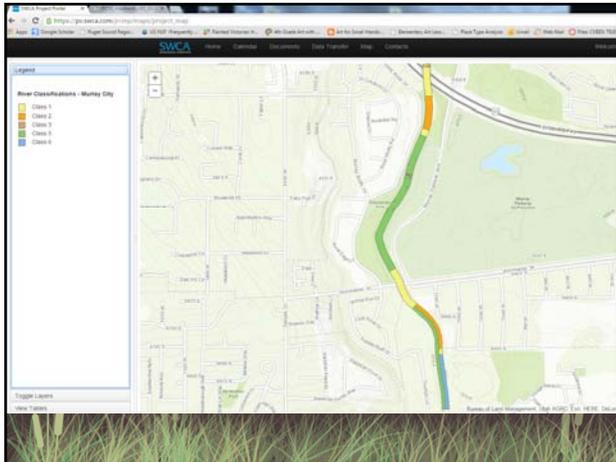
**Class 3**  
Manage for consideration of use

**Class 5**  
Manage to protect potential resource preservation options

**Class 6**  
Manage to protect existing resource preservation uses

A - Utilities Above and Below  
B - Navigation Hazard  
C - Industrial Use  
D - Municipal Park  
E - Restoration  
F - Floating Ramp/Dock/Launch  
G - Mitigation of Erosion  
H - Water Quality Monitor  
I - Potential Natural Habitat  
J - Historic Structure  
K - Outfall  
L - Road/Bridge



## **B. Municipal Depletion**

The definition for "municipal" use in the calculation of depletions is "any organization that supplies potable water and is required to report its activity as per the National Safe Drinking Water Act." The Amended Bear River Compact specifically exempts self-supplied domestic and stockwater use in the Upper and Central divisions from depletion charges. In order to be consistent, this exemption is extended to the Lower Division as well.

The increased or decreased depletion attributed to municipal uses since January 1, 1976, will be calculated, tabulated, and reported as provided for under Section F.

In preparing past municipal depletion estimates, the Commission has found that the availability and quality of system specific water usage and depletion data varies considerably within the Basin. It therefore directed the TAC to develop a common, population based method for estimating municipal depletions. The TAC gathered data for about 65 public and community water systems within the Basin and estimated per capita depletions considering such factors as:

1. Measured inflow and outflow from the system
2. Types of water uses from the system
3. Whether or not outside watering was provided by the system
4. Type of waste-water disposal method
5. Published depletion values associated with the different identified water uses

Upon completion of the effort, a weighted average depletion rate of **0.11 acre-feet per capita** was calculated. This average value will be updated from time to time as directed by the Commission.

In making depletion estimates, each state will estimate the change in the number of people connected to a public or community water system since January 1, 1976 and multiply that number by the basin average depletion rate of 0.11 acre-feet per capita. If water system specific population data are unavailable, county or other suitable population data or estimates may be substituted. Depletions estimates will be made by each state for above Stewart Dam and within the Lower Division and submitted to and approved by the Commission.

The reports should consider including the following information elements:

1. Name of municipality or water-using group
2. Total diversion rate prior to January 1, 1976, known or estimated, in acre-feet
3. Diversion rate in acre-feet as of current reporting date
4. Total diversion increase or decrease in acre-feet since 1976

- ~~5. Total depletion increase or decrease in acre-feet since January 1, 1976 (The depletion will be an agreed-upon factor representing the percent of the diversion which is consumed times the total diversion increase or decrease.)~~
- ~~6. State and division~~

~~Division totals within each state will be reported.~~

~~Where measured or metered data are not available, estimated use based on population or other indirect methods may be used and a mathematical calculation made to determine water use increase or decrease after January 1, 1976. The Commission will require that documentation be submitted which outlines the process the state used to determine the depletion. Municipal depletions will be submitted to and approved by the Commission.~~

## A. Irrigation Depletion

### 1. New Irrigated Lands

Depletion amounts from new irrigated lands, put in production since January 1, 1976, will be determined by multiplying the acreage brought into production by the irrigation depletion of the crop mix within a subbasin. Under the direction of the Commission, in 2015 the TAC completed an effort to update the crop mix for each subbasin. These updated crop mix values were then multiplied by updated crop evapotranspiration rates (ET) from Research Report No. 213, 2011, Utah State University, Logan, Utah by Robert W. Hill, J. Burdette Barker and Clayton S. Lewis. The irrigation of new lands will be charged an irrigation depletion based on These updated values will replace the values reported in Table 15 of Research Report #125, by Robert W. Hill, Charles E. Brockway, Robert D. Burman, L. Niel Allen and Clarence W. Robinson, Utah Agricultural Experiment Station, Utah State University, in cooperation with the University of Idaho and the University of Wyoming, January 31, 1989 which were used in prior depletion estimates.

The computed and updated depletion values in Research Report #125 are based on the weighted average crop mix for new lands irrigated since January 1, 1976 for each subbasin. These depletion values by subbasin are summarized in Appendix B. Depletion values from Appendix B the above referenced report will be used, but will be used may unless be modified by the Commission. Modifications will require supporting information, and appropriate adjusted tables to verify depletion values. Any modifications made by a state will be documented to the satisfaction of the other two states. Justification as to why the modification was desirable will be included in the documentation and approved by the Commission.

An example depletion calculation for new acreage brought into irrigated agricultural production is made as follows:

Example area: Thomas Fork Subbasin

Criteria: 40 new acres of irrigation brought into production

$$40 \text{ acres} \times 1.004 \text{ acre-feet}^* = 401.06 \text{ acre-feet of annual depletion}$$

\*(Based on Estimated Depletion from Appendix B)

By definition, depletion by the native vegetation or dryland crops is equal to the effective precipitation. No adjustment of the calculated depletion to account for prior use of the land, such as dryland agriculture converted to irrigation, will be required. Lands classified by the Commission as "meadow/wetland" which are drained and then converted to irrigated lands will not be assessed an additional depletion.

## APPENDIX B

### ESTIMATED DEPLETION FOR **POST JANUARY 1, 1976 LANDS FOR VARIOUS** SUBBASINS OF THE BEAR RIVER BASIN

Based on Average (2010-2014) Crop Mixes  
And Update ET Rates from  
USU Research Report 213 (2011)  
As Based on Calibrated Crop Coefficients  
Used With the SCS Blaney Criddle Equation  
For Water Years 1976-1987

YEAR	SUBBASIN										
	Evanston 01	Randolph* 02	Cokeville 03	Thomas Fork 04	Bear Lake 05	Soda 06	Oneida 07	Cache Valley 08	Malad 09	Tremonton 10(b&c)	Brigham City 10(a)
	INCHES										
1976	13.1	16.7	12.6	12.5	11.6	13.5	13.3	14.2	13.7	15.4	15.8
1977	15.1	19.1	13.8	13.6	13.2	11.2	15.7	15.5	18.0	16.0	16.2
1978	10.9	15.1	10.8	10.7	11.1	12.4	13.3	11.9	14.4	13.5	14.0
1979	16.0	20.3	15.9	15.8	16.8	13.9	17.2	16.8	16.3	15.6	18.1
1980	11.7	15.5	11.2	11.1	9.2	10.0	7.9	9.4	11.5	9.0	9.1
1981	14.0	18.3	16.3	16.1	15.2	15.5	14.0	15.6	19.9	18.7	18.7
1982	8.4	12.0	9.7	9.6	7.0	11.7	10.2	8.0	7.8	10.5	8.0
1983	6.1	12.2	8.3	8.2	7.1	10.6	7.7	6.2	8.9	6.6	8.7
1984	9.6	13.7	9.7	9.6	11.9	10.1	8.8	8.1	9.3	8.5	12.0
1985	16.2	18.1	15.4	15.3	15.3	11.9	12.6	12.8	17.5	14.2	15.8
1986	12.6	15.9	12.4	12.3	13.2	10.9	10.1	11.1	14.4	11.8	14.0
1987	16.7	17.9	14.4	14.3	13.5	13.8	13.3	14.3	18.0	16.9	16.7
Inches **	12.5	16.2	12.5	12.4	12.1	12.1	12.0	12.0	14.1	13.1	13.9
AF/A **	0.451.04	0.881.35	0.871.04	1.001.04	1.071.04	0.851.0 1	0.701.0 0	1.341.00	1.241.18	1.391.09	1.631.1 6

\*Depletion amounts for Randolph sub-area have been modified by the Technical Advisory Committee to 1.2 acre-feet based on a request by Utah.

\*\*An average of the specified units for all 12 years.

# Bear Lake 101

April 19, 2016



## Discussion Outline

- Bear Lake Elevation
- ~~History of Development of the Bear Lake~~
- Original Compact
- Amended Compact
- Flood Operations
- Equivalency Procedure
- Settlement Agreement (and Amended)



## Bear Lake Elevations

Bear Lake

### UP&L Datum

which is 2.75' higher than the 1929 mean sea level datum with the Pacific Northwest adjustment of 1947

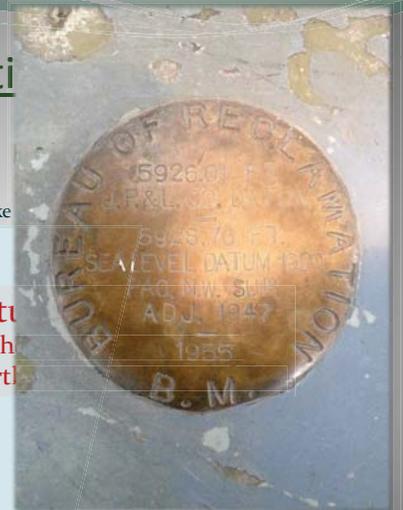


## Bear Lake Elevations

Bear Lake

### UP&L Datum

which is 2.75' higher than the datum with the Pacific North



## Bear Lake Elevations

Mud Lake

Bear Lake

5923.65 - full (1,422,000 af)

### UP&L Datum

which is 2.75' higher than the 1929 mean sea level datum with the Pacific Northwest adjustment of 1947



5902 - reservoir empty

## Original Compact

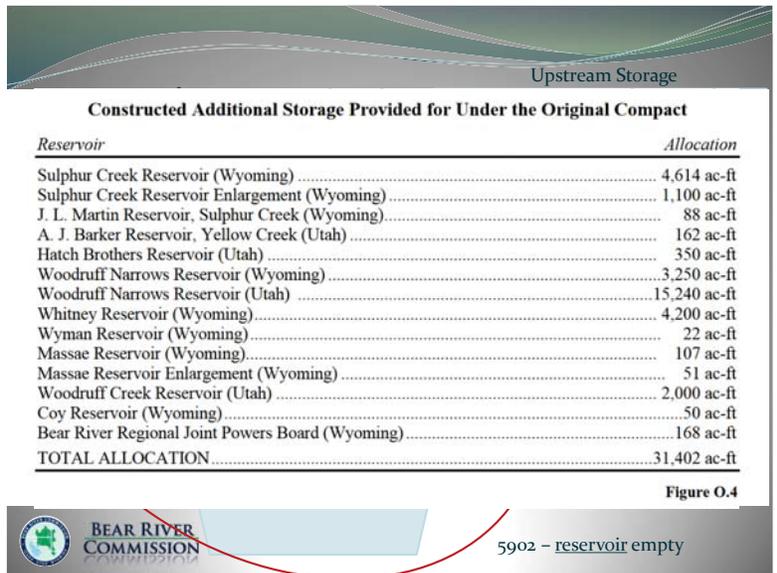
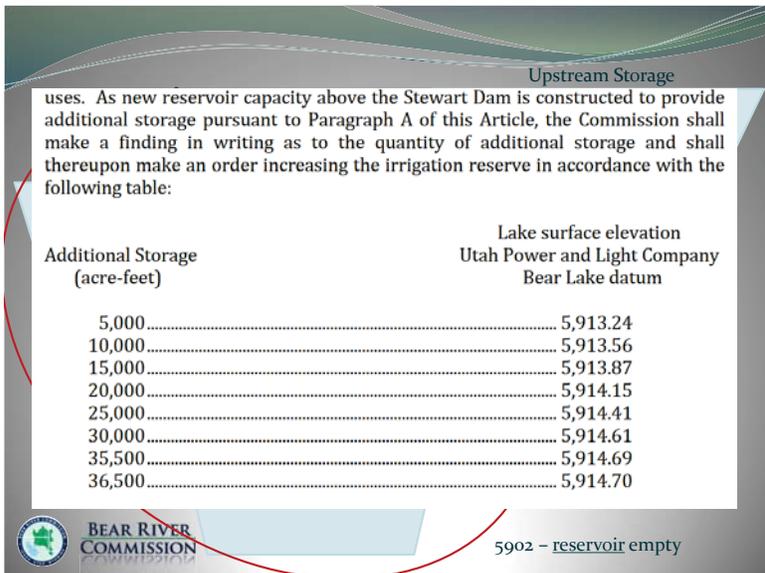
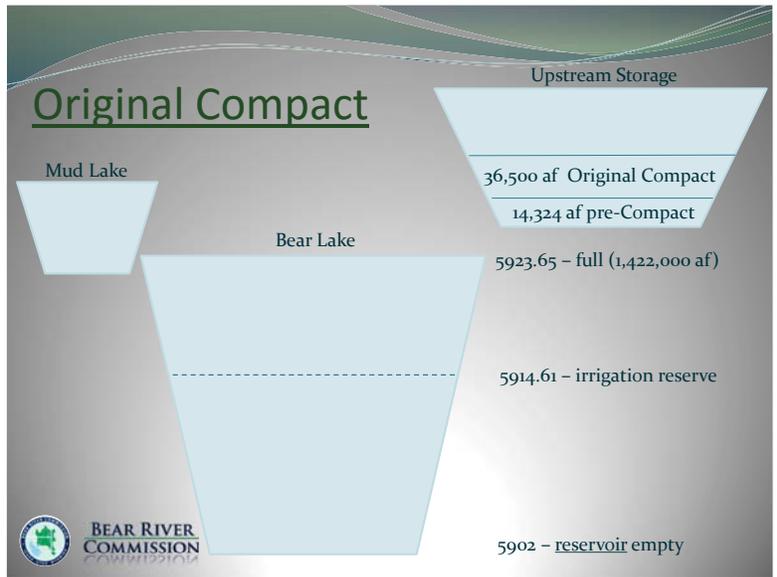
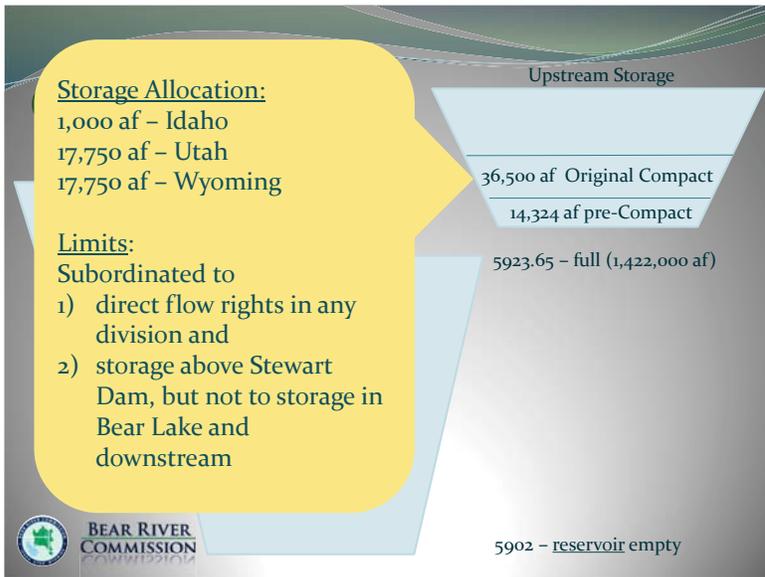
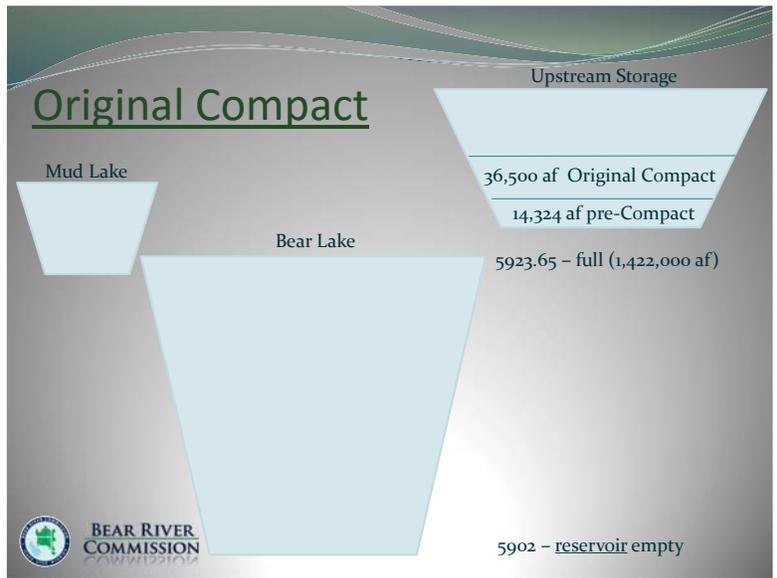
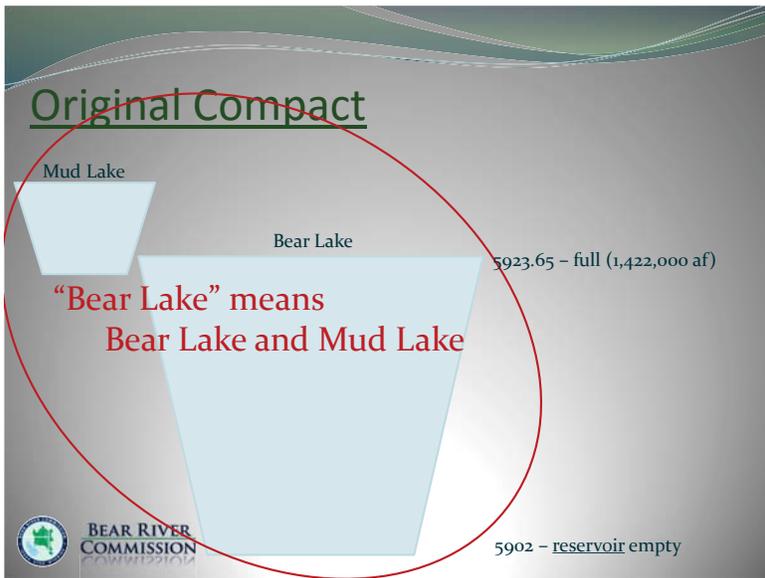
Mud Lake

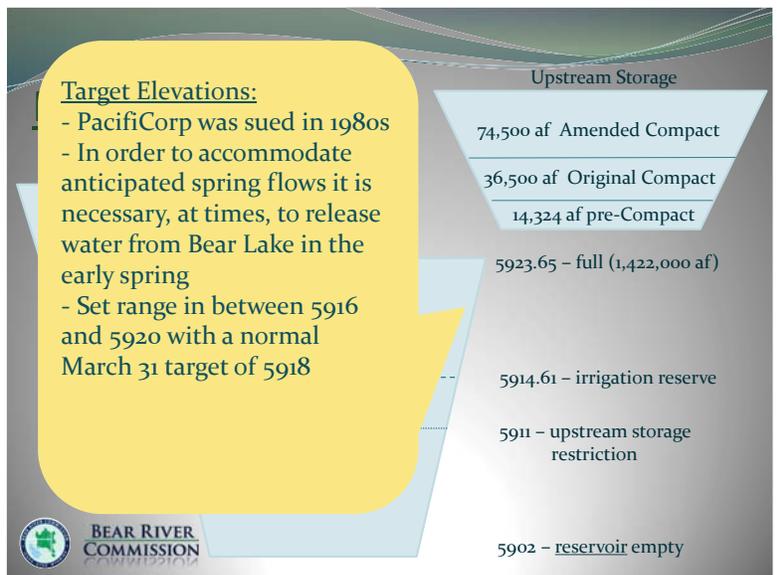
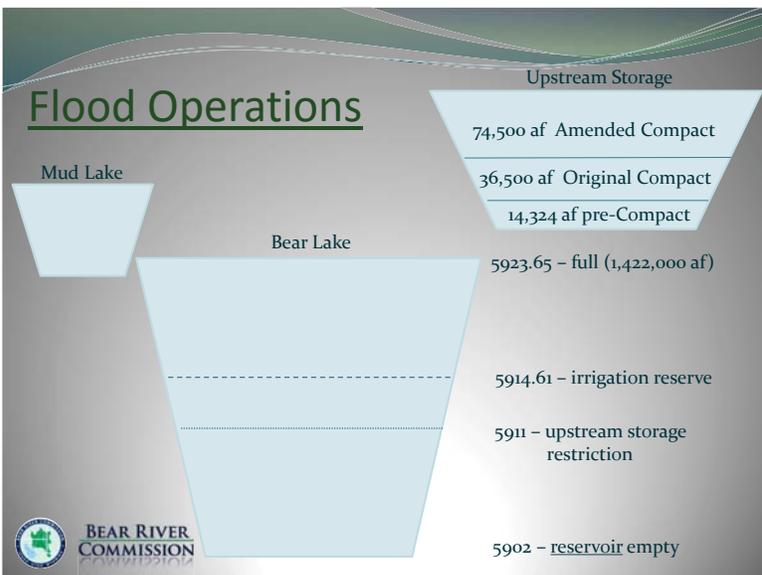
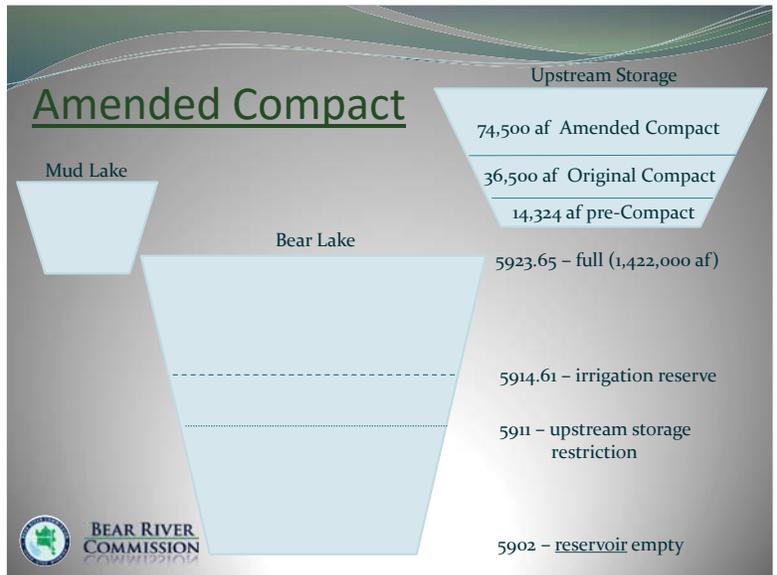
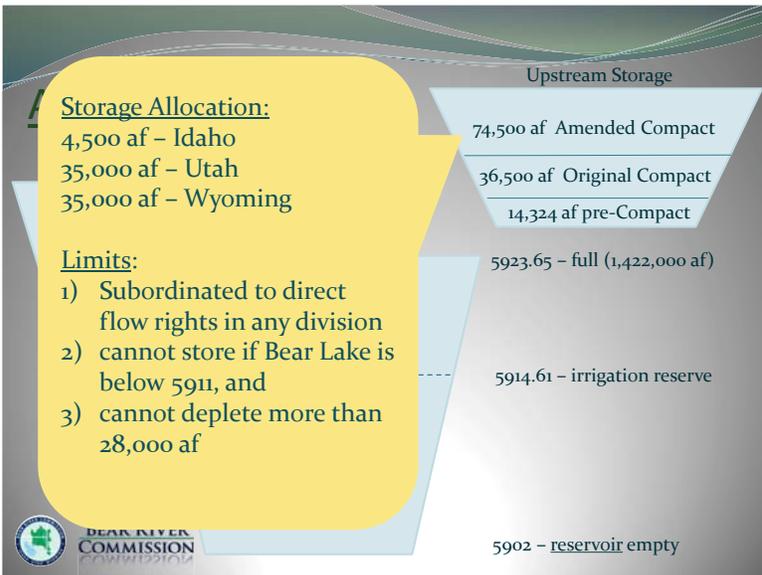
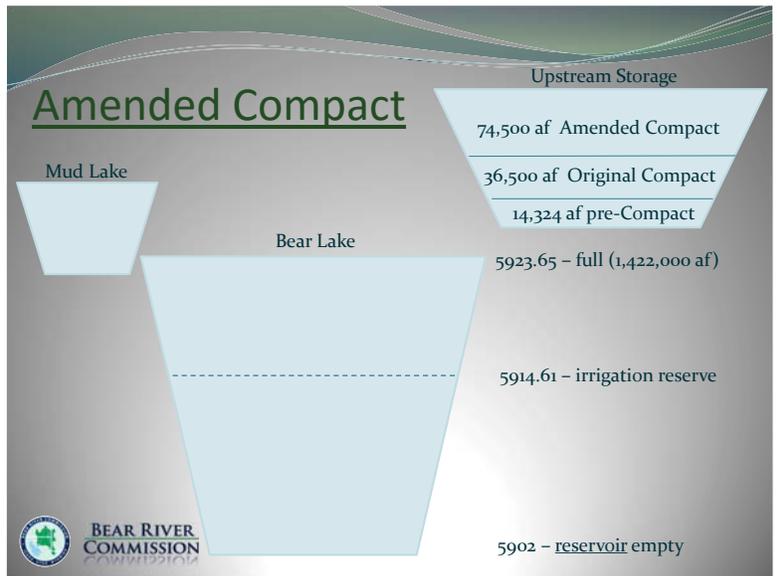
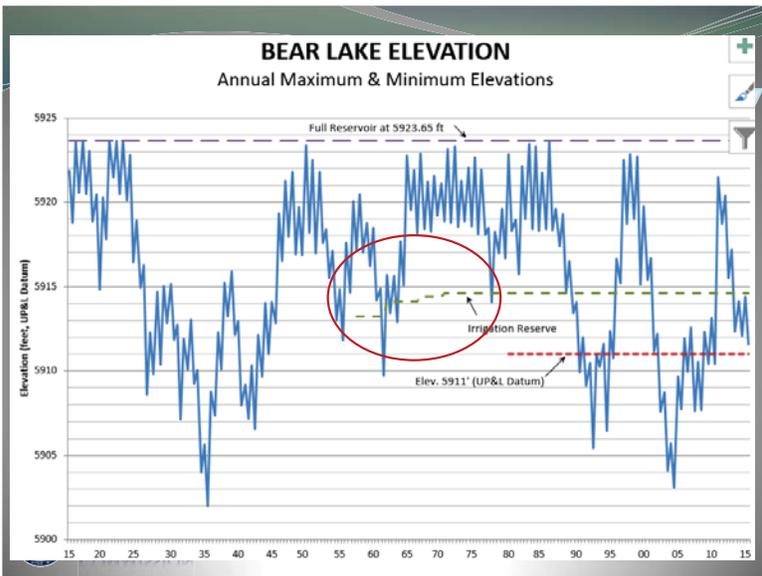
Bear Lake

5923.65 - full (1,422,000 af)



5902 - reservoir empty





# Flood Operations

Upstream Storage

74,500 af Amended Compact

C. PacifiCorp's Bear Lake Target Elevation (the "PTE"). PacifiCorp has determined the PTE represents the elevation of Bear Lake to be achieved, if possible, on March 31<sup>st</sup> of each year. The PTE may range from as low as elevation 5916 ft during projected high runoff conditions to elevation 5920 ft during projected low runoff conditions. Under normal conditions, PacifiCorp sets the PTE at 5918 ft. PacifiCorp has established the PTE to best balance long term contract requirements for Bear Lake Storage Water during sustained drought periods with flood control operation during high runoff periods. Although this increase above the Bear River Compact Irrigation Reserve results in additional lost generation at the downstream hydroelectric plants during high runoff periods, it provides on average an additional 225,000 acre feet of Bear Lake Storage Water for contract deliveries in excess of the Bear River Compact Irrigation Reserve, enhanced recreational and aesthetic opportunities at Bear Lake, and maintenance of wildlife values, while still maintaining flood control capabilities.

5902 - reservoir empty



# Flood Operations

Upstream Storage

74,500 af Amended Compact

36,500 af Original Compact

14,324 af pre-Compact

Mud Lake

Bear Lake

5923.65 - full (1,422,000 af)

5918 - March 31 target

5914.61 - irrigation reserve

5911 - upstream storage restriction

5902 - reservoir empty



# BL/ML Equivalency

Upstream Storage

74,500 af Amended Compact

36,500 af Original Compact

14,324 af pre-Compact

Mud Lake

Bear Lake

5923.65 - full (1,422,000 af)

5918 - April 1 target

5914.61 - irrigation reserve

5911 - upstream storage restriction

5902 - reservoir empty



# BL/ML Equivalency

Upstream Storage

74,500 af Amended Compact

36,500 af Original Compact

14,324 af pre-Compact

Mud Lake

Bear Lake

5923.65 - full (1,422,000 af)

5918 - April 1 target

5914.61 - irrigation reserve

5911 - upstream storage restriction

5902 - reservoir empty



Upstream Storage



## BEAR RIVER COMMISSION

### PROCEDURES FOR BEAR LAKE/MUD LAKE EQUIVALENCY CALCULATIONS

April 18, 1995

#### I. INTRODUCTION

The Amended Bear River Compact indicates that "Bear Lake" means Bear Lake and Mud Lake." The current operation of Mud Lake by PacifiCorp is to generally hold waters in Mud Lake at an elevation higher than Bear Lake. This mode of operation reduces the amount of energy expended to pump waters via the Lifton pumps. However, this mode of operation also prevents the two water bodies from equalizing in elevation, which reduces the elevation to which Bear Lake would otherwise reach if the waters were not held back by PacifiCorp.

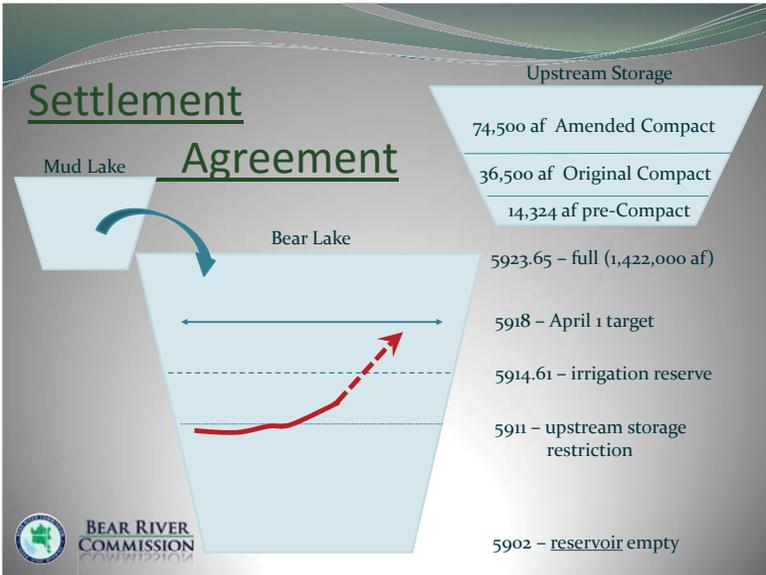
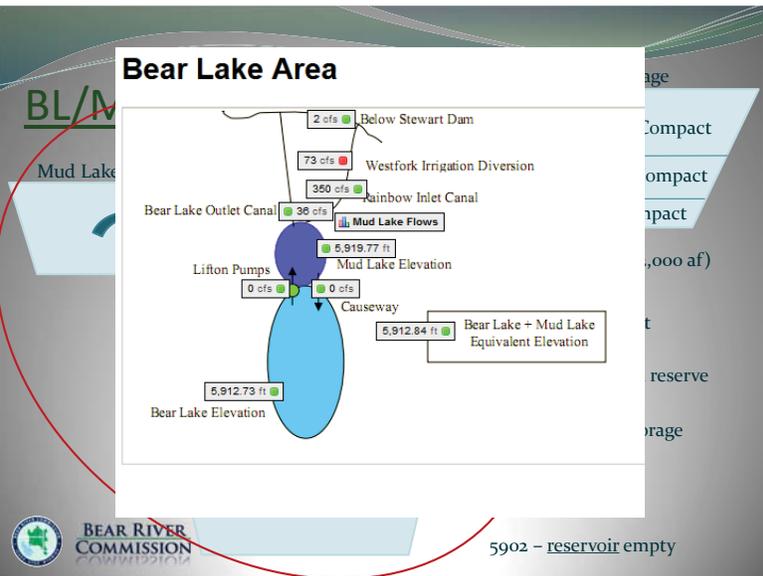
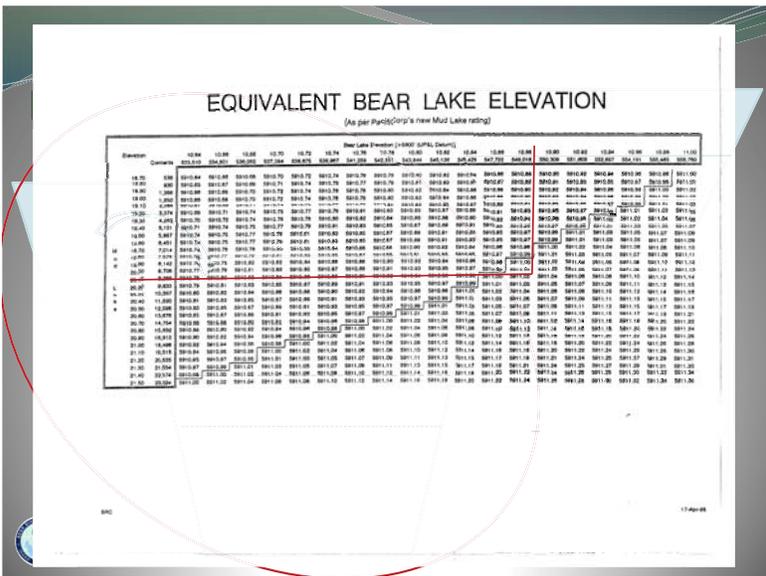
5902 - reservoir empty



## EQUIVALENT BEAR LAKE ELEVATION

(As per PacifiCorp's new Mud Lake rating)

Elevation	New Lake Elevations (BARRR COMPACT DEMAND)																							
	15.00	15.05	15.10	15.15	15.20	15.25	15.30	15.35	15.40	15.45	15.50	15.55	15.60	15.65	15.70	15.75	15.80	15.85	15.90	15.95	16.00	16.05	16.10	16.15
14.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



### EXHIBIT "A"

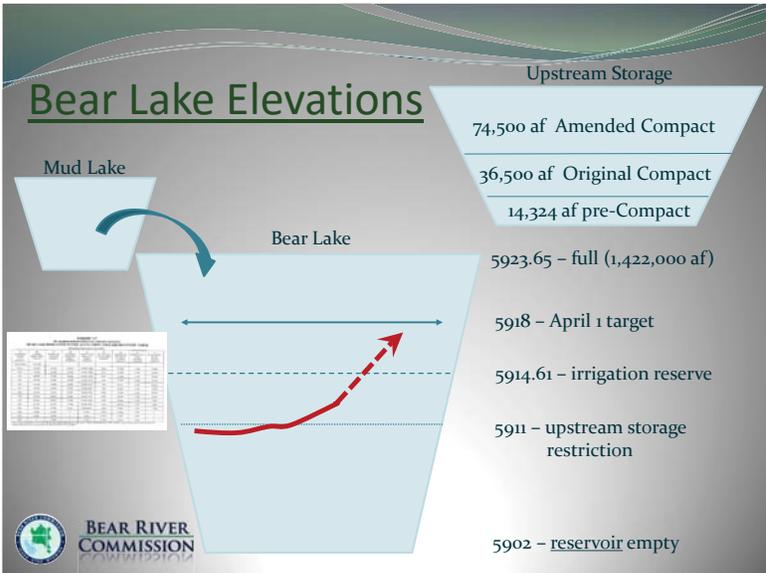
(To Amended and Restated Bear Lake Settlement Agreement)

#### BEAR LAKE IRRIGATION WATER ALLOCATION AND LAKE RECOVERY TABLE

(Quantities Expressed in Acre-feet)

(A) Estimated Lake Elevation (in Feet) (Footnote 1)	(B) Calculated Storage Content (Footnote 2)	(C) Estimated Lake Evaporation (Footnote 3)	(D) Estimated Net Storage Water Available (Footnote 4)	(E) Estimated Annual Allocation to Irrigators (Footnote 5)	(F) Decreased Transit Losses (Average) (Footnote 6)	(G) Estimated Head Gate Delivery to Irrigators (Footnote 7)	(H) Estimated System Losses (Average) (Footnote 8)	(I) Estimated Balance for Lake Recovery (Footnote 9)
5923.65 (Full)	1,421,000							
5914.7	801,000	125,000	676,000	220,000 (100%)	8,200	221,800	17,000	429,600
5914	794,000	125,000	669,000	225,000 (98%)	8,100	216,900	17,000	387,600
5913	688,000	125,000	563,000	220,000 (96%)	8,000	212,000	17,000	326,000
5912	622,000	128,000	494,000	215,000 (93%)	7,800	207,200	17,000	264,000
5911	557,000	128,000	429,000	210,000 (91%)	7,600	202,400	17,000	205,000
5910	492,000	125,000	372,000	205,000 (89%)	7,400	197,600	17,000	150,000
5909	428,000	125,000	303,000	181,000 (79%)	6,700	174,300	17,000	101,000
5908	365,000	125,000	240,000	168,000 (73%)	6,000	162,000	17,000	55,000
5907	303,000	125,000	177,000	141,000 (64%)	5,000	136,000	17,000	19,000
5906	241,000	125,000	115,000	104,000 (43%)	3,700	100,300	17,000	-6,000
5905	180,000	125,000	55,000	55,000 (24%)	2,000	53,000	17,000	-17,000
5904	119,000	125,000	0	0 (0%)	0 (0%)	0 (0%)	17,000	0
5903	59,000	125,000	0	0 (0%)	0 (0%)	0 (0%)	17,000	0
5902	0	125,000	0	0 (0%)	0 (0%)	0 (0%)	17,000	0

THE ACTUAL QUANTITY OF WATER TO BE RELEASED FROM BEAR LAKE EACH YEAR IS MEASURED AT THE OUTLET CANAL GAGE AND CALCULATED BY ADDING THE QUANTITY IN COLUMN E TO THE QUANTITY IN COLUMN H.



## SUMMARY OF WATER YEAR 2015 BEAR LAKE OPERATIONS AND IRRIGATION ALLOCATION FOR 2016

Date	Hydrologic Information/Event	Contents (% of Full) Discharge (% of Normal)
10-01-14	Bear Lake Beginning Elevation - 5,912.32 ft.	642,778 acre-feet (45%)
09-27-14	Bear Lake Low Elevation - 5,912.10 ft. (see note 1)	628,365 acre-feet (44%)
	Rainbow Inlet Canal Discharge	164,000 acre-feet (62%)
	Bear River Discharge Below Stewart Dam	1,849 acre-feet
	Bear Lake Net Runoff (Computed Total Inflow less Lake Evaporation)	137,000 acre-feet (42%)
06-23-15	Bear Lake High Elevation - 5,914.44 ft.	783,421 acre-feet (55%)
	Outlet Canal Releases; 5/1/15-5/8/15, 6/13/15-9/18/15, 9/26/15-9/30/15	185,000 acre-feet
07-01-15	Outlet Canal Maximum Release - 1,600 cfs	
	Bear Lake Storage Release (see note 2)	117,000 acre-feet
09-30-15	Bear Lake Ending Elevation - 5,911.55 ft.	592,476 acre-feet (42%)
	Bear Lake Settlement Agreement "System Loss" Volume (see note 3)	22,100 acre-feet

### Notes

1 Low contents prior to start of storage.

2 Net irrigation storage release from Bear Lake, subtracting Rainbow inflow and the decreed adjustment for the natural yield of Bear Lake and Mud Lake area.

3 Due to uncontrolled flow from (welcome) rain events. Whenever water flows below Cutler during the irrigation season any storage water in the system at Cutler is the first water out. Natural flow goes to irrigators.

### Water Year 2016

The Bear Lake Outlet Canal was opened May 1, 2015, but was shut after one week due to rainfall which increased natural flow. All water from that week passed below Cutler as "system loss" water. The canal was reopened June 13, 2015. The delay in irrigation storage releases increased the amount of water for Bear Lake recovery.

### Current Status

Bear Lake elevation as of April 18, 2016 was 5,912.74 feet (670,386 AF, 47% of maximum volume). The seasonal low elevation of 5,911.18 feet occurred on December 9, 2015. The causeway is currently closed and inflow from the Rainbow Inlet canal is filling Mud Lake until the elevation reaches 5,920.5. Mud Lake was drawn down at the request of Bear Lake National Wildlife Refuge manager to allow the Bloomington unit to be drawn down to effect a controlled burn in that unit later this fall. The Bear Lake Outlet Canal is currently closed.

### Irrigation

The anticipated spring maximum elevation of Bear Lake is 5,913.8. Bear Lake Storage Irrigation Allocation of 224,000 acre-feet was declared on April 7, 2016.

### Benefits of the Bear Lake Settlement Agreement

The table on the back of this sheet summarizes the irrigation storage allocation benefits for Bear Lake recovery.

Table of past Bear Lake Settlement Agreement allocations and savings.

Year	Allocation (TAF)	% of Maximum Possible Storage Water Delivery	BLSA Savings (TAF)	Irrigation Storage Water Delivered (TAF)	Irrigator Savings (TAF)
1998	245	100%	0	89	156
1999	245	100%	0	86	159
2000	245	100%	0	201	44
2001	245	100%	0	245	0
2002	215	88%	30	204	11
2003	181	74%	64	176	5
2004	85	35%	160	77	8
2005	141	58%	104	54	87
2006	225	92%	20	60	165
2007	218	89%	27	184	34
2008	216	88%	29	111	105
2009	209	85%	36	45	164
2010	216	88%	29	117	99
2011	245	100%	0	0	*
2012	245	100%	0	189	56
2013	245	100%	0	207.2	38
2014	245	100%	0	93	153
2015	224	91%	21	117	107

Note:

Total Bear Lake Settlement Agreement savings is 520,000 acre-feet.

Total irrigator savings is 1,400,000 acre-feet.