BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF THE MITIGATION COMPUTATIONS IN WATER DISTRICT 120 FOR THE SURFACE WATER COALITION	))))	**IDWR'S RESPONSE TO IGWA'S FIRST QUESTIONS (NOS. 1-33)**

QUESTION 1: Metadata in "SWC_Carryover_data_1959-2008.xls" states that historical carryover in regression development was normalized to be the difference between storage allocation and storage use prior to rentals and leases. However, the data in the spreadsheet suggests other adjustments were made to this calculated difference. Please explain and document more fully what adjustments were made to each of the dependent variable datasets?

ANSWER 1: The reason for the adjustments shown in "SWC_Carryover_data_1959-2008.xls" is to remove storage usages that were unique to the past two decades, but not to earlier canal operations, making the annual time series of storage use consistent from year-to-year over the past four decades. Embedded in the recorded storage use for some canals over the past two decades are these storage uses that need to be subtracted:

- Storage water delivered to lands outside the canal company/irrigation district normal place of use;
- Storage water delivered for ground water recharge; and
- Storage water delivered for conversion acres.

Storage transfers per agreements, such as the Minidoka Credit, are also accounted for. Supply of water by a canal is added to the storage use for the canal, with the net affect of decreasing carryover storage. The receiving canal's storage use is decreased by the same amount, increasing the carryover. Transfers for the Water Mitigation Corporation's agreement are handled in the same manner.

The carryover calculated for use in developing a statistical model for each canal is the sum of each canal company/irrigation district's storage contract account allocation, minus total storage, plus or minus the adjustments listed above. An itemized list of these adjustments is shown in the attached Table 1.

The sources of the itemizations and descriptions for 1990-2006 in Table 1 are from the footnotes out of storage use tables in the Water District 01 annual reports, as summarized in "swc-cnls_1959-2008_water_use_summary.xls." The sources of adjustments for 2007 are as noted in Table 1. Adjustments for 2008 are estimated for use in conjunction with the preliminary water rights' accounting from December 2008.

It should be noted that these adjustments are still in draft form and undergoing review. Some of the known discrepancies in Table 1 are use of the wrong sign for the Minidoka Credit amounts for Burley Irrigation District, and omission of Minidoka Credit amounts for the Minidoka Irrigation District.

Adjustments for restrictions on reservoir storage during 1973-1986 at Jackson Lake and American Falls are already included in the sum of the storage allocated in the CANAL_ANN_DATA tab. These adjustments account for storage that would likely have been available if repairs were not being made to the reservoirs. Further description is included in the METADATA tab of the spreadsheet "SWC_Carryover_data_1959-2008.xls."

QUESTION 2: In the proposed protocol, how will rentals and leases be considered in calculating carryover deficits?

ANSWER 2: Rentals and leases will be accounted for in carryover deficit calculations, through the process described below.

The reasonable carryover amount will be calculated with the regression equation at the end of the season. This calculated reasonable carryover amount will be compared to the "eligible" carryover remaining in the canal company/irrigation districts' accounts at the end of the irrigation season.

To get eligible carryover, first the total of the remaining storage in all accounts of the canal company/irrigation district is calculated. Next, the total of the remaining storage in all accounts is adjusted for leases and rentals to obtain the eligible carryover for comparison to the calculated reasonable carryover. To obtain the eligible carryover, any supplies to private parties or the rental pool that occurred during the season will be added to remaining storage, and any rentals will be subtracted from remaining storage. Minidoka Credit and other amounts set by agreements will be handled the same way.

An exception to this process would be when water is leased to another senior surface water user to augment supply to cover material injury resulting from junior groundwater pumping. This leased water would not be added back to the remaining storage of the lessor as a component of the eligible carryover.

QUESTION 3: In some cases the validation period begins in 1987 and in others it begins in 1989. What were the reasons for discarding 1987 and 1988 from some validation periods?

ANSWER 3: In 1987 and 1988, reservoir storage restrictions were in place at Jackson Lake. In the other years with storage restrictions at American Falls and Jackson Lake (1973 through 1986, excepting 1977), adjustments were made to storage allocations assuming the restricted volume filled in each of the years. In 1977, no adjustments were made due to the record low runoff.

Runoff volumes in 1987 and 1988 were low enough that the assumption of full reservoirs absent the restrictions did not seem justifiable. Rather than use those two years with a potentially erroneous adjustment for the storage restrictions in Jackson Lake, the years were discarded from the validation period analysis. The validation period used in diagnostic testing is 1989-2008, and is consistent throughout the analysis. Some canals were not noted as having the two years omitted in the spreadsheet "Reasonable Carryover Statistical Analysis Results.xls," but this was simply a typographical error.

QUESTION 4: The regression models for predicting reasonable carryover do not all use the same set of independent variables. What criteria were used to determine which variables to use or discard from the regressions?

ANSWER 4: Stepwise linear regression was used, starting with the full set of explanatory variables for each canal. Backwards, forwards, and in-out methods were used, all arriving at the same result. The primary test for eliminating variables was if the variance inflation factor approached ten for that variable, or increased the average of all variance inflation factors to be greater than three, indicating an unacceptable degree of inter-correlation with other variables.

QUESTION 5: Did the Department investigate the use of a common set of independent variables for all the SWC entities? Did the Department investigate the use of a zero intercept for the models? What other independent variables were considered or evaluated in developing the regression models?

ANSWER 5: For the comprehensive final analysis, the Department started with a common set of variables for all canals consisting of the runoff at Heise from April through July; seasonal, region-wide potential crop evapotranspiration; Palmer drought severity index for September; irrigation year diversion volume; and storage allocation. The stepwise regression process indicated better models could be obtained by eliminating variables that were highly inter-correlated, as measured by the variance inflation factor.

Forcing a zero intercept was not considered since, for the multiple variables used in the model, the extreme that corresponds to the minimum carryover might still be at a carryover level greater than zero.

Preliminary comprehensive analysis considered these explanatory variables:

- An "efficiency index" variable that was the quotient of the regional potential crop evaporation and annual diversion volume for each canal;
- The total system carryover from all the other canals in the upper Snake system; and
- The canal carryover lagged by one year.

Results of this preliminary analysis showed the relations between carryover and efficiency index was dramatically different between the calibration and prediction time periods for some canals, rendering the models unsound. This is explained on page two in the last paragraph of bullet item 2 in the file "prelim_carryover_results_discussion.pdf," which has been

posted at: http://www.idwr.idaho.gov/Calls/Surface%20Coalition%20Call/mitigation_ presentations.htm.

The system carryover was highly correlated with other variables, primarily Heise runoff and the Palmer drought severity index as measured by the Pearson correlation. It was discarded as it did not contribute information to the models that was not already covered the Heise and Palmer drought severity index variables.

The use of lagged carryover by one year resulted in unacceptable tails, or deviation from a linear trend of the residuals at the ends of the plot line, when plotted as percent of time occurring. This is an indication of non-normality for that variable, and it was discarded. This phenomenon can be seen in the normal probability plot on page 3 of the preliminary analysis results, which has been posted at: http://www.idwr.idaho.gov/Calls/Surface%20Coalition%20 Call/mitigation_presentations.htm.

To replace the efficiency index as a measure of the improvements in water conservation practices by the canal companies/irrigation districts, the annual diversion volume was used instead. This did not present the statistical problems that occurred with the efficiency index, and had the desired effect of capturing the increased carryover resulting from increased efficiencies over the years.

Analysis results for the preliminary calculations are in the file "prelim_carryover_results.pdf," which has been posted at: http://www.idwr.idaho.gov/ Calls/Surface%20Coalition%20Call/mitigation_presentations.htm.

More rudimentary analyses using Excel software were done that used smaller groups of the explanatory variables as an initial evaluation of the viability of the approach. A crop coefficient factor variable was also developed that accounted for regional crop distributions that was later assimilated into the potential crop evapotranspiration variable. These basic conceptual analyses can be provided upon request.

QUESTION 6: What statistical tests (e.g., for normality of data and residuals, correlations between variables) were carried out in developing the regression models?

ANSWER 6: Rigorous statistical tests were performed and are shown in the file "preliminary_carryover_results.pdf," available at the link given in the response to Question No. 5. These rigorous tests were also performed in the final analysis. All tests were not shown in the file "Reasonable Carryover Statistical Analysis Documentation," which was provided after the workshop since test results were only enhanced in the final analysis. The tests performed in the preliminary analysis are:

- Pearsons correlation among independent variables;
- Pearsons correlation of each independent versus dependent variables;
- Analysis of variance to test for independence;
- Analysis of residuals for normality, both temporally and spatially;
- Analysis of autocorrelation of residuals; and

- Tests for independence of residuals between calibration and validation periods.

In the final analysis results provided after the workshop (Reasonable Carryover Statistical Analysis Documentation), test items 3, 4, and 5 above are shown, plus matrix plots of independent versus dependent variables for the prediction versus calibration periods. The matrix plots were used as a visual aid to ascertain whether the relationships between carryover and independent variables had not changed appreciably between the calibration and validation periods.

QUESTION 7: Will carryover calculations and determinations (both reasonable and actual) all be carried out using actual (as opposed to estimated or projected) flow, climate, and diversion data for the irrigation season? If so, some of this data may have to come from WD01 accounting for the year; this accounting data has historically been considered "provisional" until February or so of the following year. Does the Department contemplate updating carryover calculations when accounting data are finalized?

ANSWER 7: Carryover calculations will be done at the end of the irrigation season in November. The best data available at that time will be used in the regression model calculations. This will include actual Heise runoff volumes; Palmer drought severity index; preliminary diversions; preliminary storage allocations; and potential crop evapotranspiration for the previous year's crop distribution, but with current year temperature data.

Any carryover deficit will be determined as described in the response to Question No. 2 using the preliminary data from Water District 01 accounting. Carryover calculations will be revised after final accounting is completed in the next year, and issued concurrently with the April forecast information for shortfalls projected in the ensuing irrigation season.

QUESTION 8: The initial natural flow supply for each SWC entity is predicted using regression models but it does not appear that these spreadsheets and regression details were included in the supporting information. Please provide these.

ANSWER 8: All the regression models are posted on the website at: http://www.idwr.idaho.gov/Calls/Surface%20Coalition%20Call/mitigation_presentations.htm. The file name is "2009SupplyForecast.xls."

QUESTION 9: It appears that the historical data used for developing these natural flow diversion regressions comprises the years 1990 through the preceding year. Does the Department propose using this sample definition in the future? Have any adjustments been made to either the independent or dependent variables in developing the regressions?

ANSWER 9: The natural flow regression analysis includes data from 1990 through the previous year. The Department will continue to use this sample definition. It is possible that in the future the sample definition will need to be re-evaluated if there are significant trends or outliers. No adjustments have been made to the diverted natural flow or the Heise natural flow volumes.

QUESTION 10: Is it correct that updates to natural flow supply will be based in part on reach gains and a "similar years" approach? If so, how are the "similar years" to be determined? What is the sample pool of "similar years"?

ANSWER 10: The updates to the natural flow supply will be based on a historical year with similar gains in the Blackfoot to Milner reach. The natural flow diverted from the similar year will be used to predict the natural flow diversion for the remainder of the season. Although, in the example sample years 1992 through the previous year was used, we have electronic accounting data through 1988. Therefore the sample pool is 1988 through the previous year.

When determining a similar year we look for years with the most similar pattern and magnitude of reach gains. Any abnormalities in the water year will be considered when selecting the similar year. If there are multiple similar years to choose from, the more conservative year will be selected.

QUESTION 11: Is it correct that the "likely fill" component of initial storage supply estimate also will be determined using a "similar years" approach? If so, how are the "similar years" to be determined in this case?

ANSWER 11: The initial storage supply will be estimated using a similar year. The similar year will be determined by comparing the Heise natural flow forecast volume for April through July to historical flow volumes. Of the years with a similar runoff forecast, the year with the most similar paper accounting fill as compared to the current paper accounting fill will be used to predict the fill.

QUESTION 12: Is it correct that the storage supply estimate will be updated at the time of the initial storage allocation? How will any carryover replacement water delivered by ground water users figure into this updated storage supply? Will there be late-season adjustments to storage supply estimates? If so, describe how these will be made.

ANSWER 12: Yes. An estimate of mitigation requirement is computed in April prior to the filling of the reservoirs. Storage allocations are later published by Water District 01 after the day of maximum reservoir accrual has occurred. This day can occur as early as May in very dry years and as late as July in very wet years. When the storage allocations have been published by Water District 01, the Department will compute an updated amount of replacement water and notify ground water users of any changes to previously issued mitigation requirements.

Any carryover replacement water delivered by ground water users will be included in the total mitigation requirement computed after Water District 01 has published its reservoir storage allocations for the irrigation season.

It is possible that something such as previously undiscovered gaging errors could cause a significant adjustment to the storage allocations published earlier in the irrigation season by Water District 01. If this situation should occur, it could result in either a late-season adjustment or an adjustment to the mitigation requirement computed following the irrigation season.

QUESTION 13: Describe how irrigated acreage for each SWC entity will be determined each year and utilized for purposes of the SWC mitigation calculation. How will this acreage be adjusted in making updated mitigation calculations?

ANSWER 13: Irrigated acreage is determined as follows:

A Geographic Information System shapefile is prepared depicting acres irrigated for each water delivery organization.

- The initial shapefile is prepared by Department staff, and shared with the water delivery organization;
- Inputs and changes are sought from each water delivery organization;
- When information is received from the water delivery organization, the information is reviewed and a summary report is prepared and issued; and
- This information is updated from time-to-time as conditions are deemed to have significantly changed, at a minimum once every five years.

If the acreage irrigated count is within five percent of the irrigated acreage limit of the water right, no adjustments to mitigation calculations are deemed necessary due to acreage count. If the acreage count is more than five percent in excess of the irrigated acreage limit of the water right, further investigation is required to determine the reason for the use of water on excess lands. If the acreage count is less than five percent less than the irrigated acreage limit of the water right, then an assessment must be made of the impact of this reduction in use of the water right on the mitigation requirement.

QUESTION 14: The Department proposes using 2006 diversions as the foundation for a baseline demand assumption. The quantitative rationale for this choice appears to rely on total-season comparisons of runoff, PET and growing-degree-days (GDD). Were any monthly or shorter-period evaluations made using these or other parameters? If so, please provide these.

ANSWER 14: The quantitative analysis shown in "SWC_1990-2008_canal_plots.xls" used the April through September growing degree days, April through July Heise natural flow volume, and the April through September potential crop evapotranspiration. Other parameters considered are included in the spreadsheet: the natural flow use, storage use, and storage allocation for each canal company/irrigation district.

QUESTION 15: The 2006 baseline demand reflects adjustments for early season precipitation in 2006. In determining these adjustments, did the Department perform any analysis of antecedent soil moisture conditions for 2006 or for any other years? If so, please provide these.

ANSWER 15: Antecedent soil moisture conditions were not analyzed for 2006 or other years, beyond what is shown in the *TFCC-raw data* worksheet tab of "Protocol Spreadsheet 5-4-09.xls." Data developed by the University of Idaho research station at Kimberly will be used for estimating historic soil moisture conditions at Rupert and Kimberly for comparison to 2006 and current conditions. That data are still being developed and will be provided when complete.

QUESTION 16: Were any other adjustments to 2006 diversions considered in defining the baseline demands? If so, please describe.

ANSWER 16: No other adjustments were made to the 2006 diversions.

QUESTION 17: On slide 13 of the presentation "RISD Protocol 5-1-09.ppt" there appear to be errors in the subscripting in the formula for RISD. Is the intention that RISD be based on actual water needs in preceding months and baseline needs in subsequent months? What is the definition of "FS" in the second equation?

ANSWER 17: Lower bound and upper bound notation for RISD summation equation have been updated. RISD is combined value of the summation of actual crop water need divided by the project efficiency, for each month of the irrigation season that has already occurred, and the summation of baseline demand for each month in the remainder of the season. Definitions for Baseline Demand (BD) and Forecast Supply (FS), defined previously in the presentation, have been added to the slide in question.

QUESTION 18: Will in-season shortage calculations be updated exactly twice each year? If an updated calculation shows an increase in the projected shortage from a prior calculation, how will ground water users obligations be adjusted and on what schedule?

ANSWER 18: The protocol proposes that in-season computations of RISD be calculated exactly twice during the irrigation season: once at the approximate half way point of the irrigation season (first two weeks of July); and once at the approximate three quarters point of the irrigation season (first two weeks of September). At these milestones updated values for forecast supply (FS) will be subtracted from the calculated RISD value to determine a current demand shortfall (DS), which the Department will then publish. If these calculations indicate that water, in addition to that already secured by ground water users, is required, ground water users will have two weeks from the date revised values are published to provide evidence to the Department that they have secured the additional volume of water. As before, any volume of water less than the reasonable carryover deficit amount owed to the SWC must be provided immediately and any volume of water in excess of the reasonable carryover deficit may be provided to the SWC at the time of need.

QUESTION 19: The *Final Order Regarding the Surface Water Coalition Delivery Call dated September 5, 2008* ("Final Order"), incorporated all Findings of Fact and Conclusions of Law of the former Director including the series of Orders culminating in the May 2, 2005 Order and also the Hearing Officer's *Opinion Constituting Findings of Fact, Conclusions of Law and Recommendation, dated April 28, 2008* ("Opinion"), unless modified in the *Final Order* (Final Order, p. 12). The Opinion at page 55 incorporated in the Final Order states: "Full headgate delivery for Twin Falls Canal Company should be calculated at 5/8ths inch instead of 3/4s inch." Please describe how that requirement is addressed in the mitigation computations.

ANSWER 19: Consideration of full headgate delivery rates would be necessary if the baseline demand supply were based solely on a historic diversion volume for a season. This was

the method used in the May 2, 2005 Order. The proposed method of the protocol does not utilize the historic diversion volume as the only measure of reasonable need.

Reasonable need in the proposed protocol is accounted for by measurement of actual crop water requirement through remote sensing applications. That reasonable need must be met by a volume of water, but distributing that volume of water by a set rate at the farm headgate is not the limiting factor in getting that volume to the crops. This is evidenced by the graph shown in the TFCCMiners worksheet tab in the "Expert_report_analys.xls" spreadsheet posted at: http://www.idwr.idaho.gov/Calls/Surface%20Coalition%20Call/mitigation_presentations.htm.

In this graph, annual diversion volumes are plotted with each year's headgate delivery rate denoted. Headgate deliveries for Twin Falls Canal Company in 2003 were 5/8-inch, yet that volume diverted exceeded 2006, the proposed baseline year. It is presumed that headgate deliveries exceed 5/8-inch in 2006 for some, or all of the seasons since system storage filled.

QUESTION 20: Page 53 of the Opinion, incorporated in the Final Order, states: "Non-irrigated acres should not be considered in determining the irrigation supply necessary for SWC members." Please describe how this is addressed in the calculation of the mitigation requirement and how and when it will be periodically adjusted.

ANSWER 20: See the response to Question No. 13.

QUESTION 21: The Opinion incorporated in the Final Order, referred to the Supreme Court's Decision in AFRD No. 2 at page 882 stating: "Consequently, in determining the amount of carryover storage to which the irrigation districts are entitled when curtailment is ordered, the amount of water sold or leased for purposes outside the licensed or adjudicated right must not be considered in calculated storage." (Opinion, p. 61, 64.) Please describe how water sold or leased by SWC entities will be calculated in determining the mitigation requirement.

ANSWER 21: Leased or sold water will be considered as described in the response to Question No. 2.

QUESTION 22: The Hearing Officer's Opinion at page 60, incorporated in the Final Order, recognized that under CM Rule 42, the SWC is entitled to maintain a reasonable amount of carryover storage, but made no attempt to determine what the proper amount was. Again citing AFRD No.2 at page 882 the Hearing Officer recognized that "Somewhere between the absolute right to use a decreed water right and an obligation not to waste it and to protect the public's interest in this valuable commodity, lies an area for the exercise of sound discretion by the Director." Please describe how the Director intends to exercise this discretion in determining reasonable carry-over storage as part of the SWC mitigation requirement.

ANSWER 22: The protocol envisions a three step process that ensures the reasonableness of carryover storage.

- Step one is conducted in the fall with a computation of the amount of carryover that would have been available based on pre-ground water pumping conditions. To the extent

the actual storage is less than this amount (after accounting for the impacts of any assignments of the storage to others than the contract holder), ground water users are placed on notice of this amount.

- Step two is a computation of the storage that is available in early April, when natural flows for the year are projected. Computation of projected natural flows plus storage results in a determination of projected shortfalls, resulting in a mitigation requirement. Curtailment will be ordered for any acres for which ground water users cannot show evidence that the required mitigation can be provided.

- Step three is a refinement of step two, based on actual allocation of storage. This step is to be conducted as soon as possible after the annual "day of allocation." Within two weeks after notice provided by the Department, ground water users must assign storage water to the SWC for any shortfall in reasonable carryover.

QUESTION 23: The Opinion at pages 61 and 64, incorporated in the Final Order, states that the right to secure reasonable carryover storage through curtailment does not extend to make up for water that is sold or leased "for uses unrelated to the original rights, e.g., the sale of water through ESA flow augmentation, power production, etc." Please describe how this limitation will be included in the calculation of the mitigation requirement.

ANSWER 23: See the response to Question No. 2.

QUESTION 24: The Opinion at page 62, incorporated in the Final Order, held that the determination of reasonable carryover storage should not consider more than a one year supply: "Anticipating more than the next season of need is closer to faith than science." "Curtailing total water for longer than a year runs the risk of being classified as hoarding, warned against by the Supreme Court in AFRD No. 2." Does the determination of the SWC mitigation requirement not consider more than a one-year supply? If so, please explain why and how.

ANSWER 24: The Draft Protocol complies with the guidance in the Opinion at page 62 by not considering more than a one year supply. The Draft Protocol, as further described in the response to Question No. 22, limits implementation of reasonable carryover to one year, beginning with a determination of carryover at the end of one season and continuing through only the next season.

QUESTION 25: The Opinion at pages 26, 40, 51, 52 and 67, incorporated in the Final Order, recognized that the licensed or decreed quantity is a "maximum amount" to which the right holder is entitled, i.e., an authorized but not guaranteed amount; and, further if crop needs are met, there is no material injury and no right of curtailment. Please describe how the calculation of the mitigation requirement for the SWC entities will distinguish between the maximum quantity under their respective water rights and the amount needed to meet crop needs in determining when junior ground water users should be subject to curtailment.

ANSWER 25: Distinction between maximum right quantities and actual need is accomplished as follows.

- Establishment of project efficiency:

The current project efficiency for each canal company/irrigation district is calculated using the 2006 diversion and 2006 actual crop water need, as measured by satellite-based remote sensing technologies. Operation of the system at this efficiency level then assures optimum use of water for current practices.

- Crop water needs and actual diversion requirements:

The current crop water need is measured via satellite technology over the irrigation season. Actual diversion requirements are back calculated by dividing the measure crop water need volume by the project efficiency. Since the project efficiency is representative of the best achievable level, the actual diversion requirement represents the actual need.

QUESTION 26: The Opinion, at page 33, incorporated in the Final Order, held that the application of the 10 percent trimline is proper to avoid a significant probability that curtailment would extend to ground water users who would suffer significantly without contributing water where necessary to remediate the material injury to the Surface Water Users. Please describe how the 10 percent trimline will be utilized in determining and administering the mitigation requirement to SWC entities.

ANSWER 26: The trim line will be applied consistent with the May 2, 2005 Order. The Hearing Officer upheld this practice in his April 29, 2008 Order and it was accepted by the Director in his September 5, 2008 Final Order.

QUESTION 27: In computing the reasonable carryover storage amount, please describe how the reservoir storage space priorities held by the different SWC entities is taken into consideration. If reservoir priorities are not considered, please explain why. Also explain how those SWC members that have storage space that fills every year would ever receive benefit by water carried over from the prior year.

ANSWER 27: Reservoir storage priorities are not considered, as they are all senior to the majority of ground water users that would be affected by curtailment.

It is the Department's understanding that SWC storage accounts have not been filled consistently from year-to-year. For instance, in 2004, each SWC member had one or more partially full reservoir account that would have received benefit of carryover storage from the preceding year.

QUESTION 28: If the so-called "reasonable in-season demand" is not being met will the curtailment of junior ground water pumpers be basin-wide or based upon a 10 percent trimline? If a trimline, please explain how the trimline will be applied in WD 120.

ANSWER 28: The trim line will be applied as discussed in the response to Question No. 26.

QUESTION 29: If there is a mitigation requirement based on "reasonable in-season demand", please explain how any calculated shortfall will be allocated between the three contributing factors: (1) changes in irrigation practices/incidental recharge over time; (2) drought conditions; and (3) ground water pumping.

ANSWER 29: Calculated shortfalls for SWC delivery call mitigation requirements are allocated only to ground water pumping. The Department recognizes that drought conditions, changes in irrigation practices, and changes in incidental recharge are factors that may affect river reach gains that are hydraulically connected to the ESPA. Accordingly, the Department only requires that holders of junior priority ground water rights within the SWC curtailment area be responsible for any determined shortfalls up to the amount of river reach depletions simulated from the curtailment of junior priority rights using the ESPA ground water model.

QUESTION 30: Since all SWC entities other than TFCC and NSCC rely primarily upon early season runoff and storage water for their annual water supply, please explain how irrigation supply differences will be addressed and accounted for in determining the SWC mitigation requirement.

ANSWER 30: The mitigation requirement or demand shortfall is calculated by subtracting the forecast supply from the RISD. Forecast supply is a function of natural stream flows at the Heise Gage and total available storage water. Differences in irrigation supply sources are only relevant in that when combined they equal the forecast supply volume which is used to determine the demand shortfall.

QUESTION 31: Given the denial of the delivery call made by A&B Irrigation District and its physical proximity to SWC diversions, will A&B's ground water rights be subject to the same mitigation obligations as other ground water users? If not, please explain why.

ANSWER 31: A&B Irrigation District's (A&B) ground water rights are located within the SWC ground water curtailment area. A&B's ground water rights would be subject to the same mitigation obligations as other ground water users to the extent that any of A&B's ground water rights have priority dates that are determined to cause material injury to any of the SWC senior priority surface water rights. A&B has been the recipient of one or more curtailment warning letters from the Department relative to the SWC delivery call. In addition, certain A&B junior priority ground water rights have been included in one or more water right curtailment lists associated with such warning letters.

QUESTION 32: Because SWC entities provide water to the BOR for flow augmentation, please explain how this leased water will be accounted for and adjusted to ensure that the mitigation obligations of ground water users are not increased.

ANSWER 32: Under the current Water District 01 Rental Pool Procedures, all SWC entities and all other participating spaceholders within Water District 01 have collectively agreed to supply flow augmentation rental to the Bureau of Reclamation according to the conditions in the Nez Perce Water Rights Settlement. The impact of supplying this rental from Upper Snake

reservoirs can vary from year-to-year and from spaceholder-to-spaceholder depending on the following year's water supply and reservoir fill. Water District 01 computes the impacts (unfilled space) attributed to these rentals immediately after the storage allocations are computed in the season following the year in which the rentals were supplied. Impacts can only occur in years when the reservoir system does not fill or in years when flood-control water is not spilled past Milner Dam. Mitigation obligations of ground water users are not adjusted for any SWC unfilled reservoir space (if any) attributed to impacts from flow augmentation rentals.

QUESTION 33: Please explain how recharge, demand reductions, etc., implemented under the CAMP process will be accounted for in determining the mitigation obligation of SWC entities.

ANSWER 33: All changes to the conditions that govern the surface water-ground water relationship including long term climate change, changes in irrigation practices, and changes due to the CAMP process will be reflected in the criteria that are used to select the baseline year, which are: using a year of normal runoff, normal precipitation during the growing season and normal range of ET, and the use of a year that represents current irrigation practices. Conceivably to meet all of the baseline year selection criteria the baseline year will have to be updated regularly, maybe as often as every five years. To the extent physical conditions that influence these selection criteria change and have a positive influence on reach gains, the mitigation requirements of ground water users would be lessened.

DATED this 29th day of May, 2009.

David R. Tuthill, Jr.
Director

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 29th day of May 2009, a true and correct copy of the foregoing document was served upon the following by the indicated method:

RANDY BUDGE CANDICE MCHUGH RACINE OLSON PO BOX 1391 POCATELLO ID 83204-1391 rcb@racinelaw.net cmm@racinelaw.net	(x) U.S. Mail, Postage Prepaid ( ) Facsimile (x) E-mail
JOHN SIMPSON TRAVIS THOMPSON BARKER ROSHOLT PO BOX 485 TWIN FALLS ID 83303-0485 jks@idahowaters.com tlt@idahowaters.com	(x) U.S. Mail, Postage Prepaid ( ) Facsimile (x) E-mail
TOM ARKOOSH CAPITOL LAW PO BOX 2598 BOISE ID 83701 tarkoosh@capitollawgroup.net	(x) U.S Mail, Postage Prepaid ( ) Facsimile (x) E-mail
W. KENT FLETCHER FLETCHER LAW OFFICE PO BOX 248 BURLEY ID 83318-0248 wkf@pmt.org	(x) U.S. Mail, Postage Prepaid ( ) Facsimile (x) E-mail
SARAH KLAHN WHITE JANKOWSKI 511 16TH STREET STE 500 DENVER CO 80202 sarahk@white-jankowski.com	(x) U.S. Mail, Postage Prepaid ( ) Facsimile (x) E-mail

Victoria Wigle

Victoria Wigle
Administrative Assistant to the Director
Idaho Department of Water Resources

Table 1. List of Adjustments to Storage Use (continues on next sheet)

YEAR	ADJUSTMENT AMOUNT (AC-FT)	DESCRIPTION
Twin Falls Canal Company		
1992	1,200.00	Storage transfer from Salmon Irrigation to Twin Falls Canal.
1993	6,625.00	Storage transfer from Salmon Irr to Twin Falls Canal Co.
1994	4,982.00	Storage transfer to Twin Falls from Artesian (1,981.5 AF) and Salmon Irr. (3,000 AF).
1995	-	
1996	2,080.00	Storage transfer from Artesian Irr. To Twin Falls Canal.
1997	-	
1998	1,914.00	1,913.9 AF storage transfer from Artesian Irrigation
1999	1,908.00	1,908.1 AF storage transfer from Artesian Irrigation
2000	1,880.00	Storage transfer from Artesian Irrigation to Twin Falls Canal and Milner Irrigation.
2001	1,874.50	1,874.5 AF transfer from Artesian Irrigation
		1,857.6 AF storage transfer from Artesian Irrigation minus 24,000.0 AF to A&B Irrigation (2001 storage exchange)
		minus 3,946.4 AF (88.2%) of Minidoka Credit reach loss minus 1,546.1 AF adjustment to carryover for storage
2002	1,858.00	spilled past Milner.
2003	1,169.00	1168.9 AF storage transfer to Twin Falls Canal from Artesian Irrigation.
2004	960.00	959.7 AF storage transfer from Artesian Irrigation,
2005	2,194.00	1,499.9 AF storage transfer from Artesian plus 694 AF credit for FMC groundwater transfer.
2006	2,027.00	Storage transfer from Artesian Irrigation (1,577.3 AF) and FMC groundwater rental credit (450 AF).
		Xfer from Artesian Irrigation (1,564) plus FMC Groundwater rental Credit (554) minus xfer to Min. Cr. (6750)
2007	8,550.00	(2007 storage report, Water District 01)
2008	8,550.00	Preliminary estimate of 2008 adjustments (to be revised)

North Side Canal Company

		40,982 AF (rounded) B.O.R. rental exchanged to I.G.W.A. for high-lift pumping and assigned to North Side Canal fo
2005	41,000.00	WD130 conversions
2006	-	
		50,000 AF from IGWA fro WD 130 conversion acres and late season recharge, 9,000 AF of additional late season
2007	69,000.00	recharge from IDA (estimated from 2007 and 2008 storage report itemizations).
2008	7,750.00	Preliminary estimate of 2008 adjustments (to be revised)

American Falls Reservoir District No. 2

2007	(9,500.00)	Transfer from Dairy and processors (8500 AF) and Minidoka Credit (2007 storage report, Water District 01)
2008	(1,000.00)	Preliminary estimate of 2008 adjustments (to be revised)

Milner Irrigation District

1990	-	
1991	-	
1992	6424.9	Storage Transfer from Artesian Irrigation (2328.7 AF) and Salmon Irrigation (4096.2 AF) to Milner Low Lift.
1993	2839.8	Storage Transfer from Artesian Irrigation to Milner Low Lift.
1994	3981.3	Storage Transfer from Artesian Irrigation to Milner Low Lift (781.3 AF) and Salmon Irrigation (3,200 AF).
1995	-	
1996	-	
1997	-	
1998	918.20	Storage Transfer from Artesian Irrigation to Milner and Twin Falls Canal.

1999	-	
2000	885.50	Storage transfer from Artesian Irrigation to Twin Falls Canal and Milner Irrigation.
2001	882.10	Storage transfer from Artesian Irrigation to Milner Irrigation (882.1 AF) and Twin Falls Canal (1,874.5).
2002	391.20	875.3 AF storage transfer from Artesian Irrigation minus 484.1 AF adjustment to carryover for storage spilled past Milner.
2003	1,539.50	1539.5 AF storage transfer to Milner Irrigation.
2004	1,451.70	Groundwater mitigation.
2005	1,248.50	Storage transfer from Artesian to Milner Irrigation (1,248.5 AF)
2006	1,373.50	Storage transfer from Artesian Irrigation (1,213.5 AF) and Southwest Irrigation (160 AF).
2007	7,117.00	Sum of adjustments from Eighth Supl. Order, pg 4
2008	7,117.00	Preliminary estimate of 2008 adjustments (to be revised)

Burley Irrigation District

2003	1556.1	3,069.5 AF storage return flow credit minus 1,513.4 AF storage transfer to pump diversions
2004	-	
2005	1702.2	2,865.9 AF return-flow credit, minus storage transfers to Herbert (130.2 AF), Burley G.C. (226.7 AF), Burley Airport (152.9 AF), Amalgamated Sugar (92.0 AF), Tilley (41.3 AF), Coors (86.3 AF), Bar-U-Ranch (164.2 AF), M. Hobson (169.8 AF),
2006	1975.1	3,095.4 AF of Minidoka Return-Flow Credit minus 1,120.3 AF of storage transfer to BID pumps.
2007	-	
2008	3,730.20	Preliminary estimate of 2008 adjustments (to be revised)

Minidoka Irrigation District

2008	10,000.00	Preliminary estimate of 2008 adjustments (to be revised)