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BEFORE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF WATER TO WATER RIGHT NOS. 36-02551 AND 36-07694 (RANGEN, INC.)	)	Docket No. CM-DC-2011-004 **TENDER OF CITY OF POCATELLO'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER**

COMES NOW, City of Pocatello to submit its Proposed Findings of Fact, Conclusions of Law and Order which are attached as Exhibit A hereto. A Word version of the document has also been provided electronically for the convenience of the Department and the parties.

Respectfully submitted this 21st day of June, 2013.

CITY OF POCATELLO ATTORNEY'S OFFICE

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CERTIFICATE OF SERVICE

I hereby certify that on this 21st day of June, 2013, I caused to be served a true and correct copy of the foregoing **Tender of City of Pocatello's Proposed Findings of Fact, Conclusions of Law and Order** for **Docket No. CM-DC-2011-004** upon the following by the method indicated:

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BEFORE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF WATER TO WATER RIGHT NOS. 36-02551 AND 36-07694	)	Docket No. CM-DC-2011-004
	)	**CITY OF POCATELLO'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER**
(RANGEN, INC.)	)	

FINDINGS OF FACT

I. PROCEDURAL HISTORY:

1. Rangen, Inc. filed a Petition for Delivery Call with the Idaho Department of Water Resources on December 13, 2011.

2. Rangen is an animal feed producer, and a leading producer of aquaculture feed in the United States. Pet. at 1, (December 13, 2011).

3. Rangen operates a fish hatchery known as the "Rangen Aquaculture Research Center" in the Thousand Springs Reach of the Snake River in Water District 130. Pet. at 2; Courtney, Vol. 1, 58:9-11.

4. Rangen's fish hatchery is operated to support research and testing for purposes of developing fish food and for marketing. Ex. 1015; Courtney, Vol. 1, 64:10-23.

5. For its aquaculture operations, Rangen relies on its partially decreed water rights for water arising at the Martin-Curren Tunnel. Pet. at 2.

6. The flows in the Martin-Curren Tunnel are tributary to the Snake River. Pet. at 2.

7. Rangen alleges injury to water right nos. 36-02551 and 36-7694. Pet. at 3.

8. Water right no. 36-2551 has a 1962 priority date to divert 48.54 cfs. Partial Decree No. 36-2551, Ex. 1026.

9. Water right no. 36-7694 has a 1977 priority date to divert 26 cfs. Partial Decree No. 36-7694, Ex.1028.

II. PAST DELIVERY CALLS:

10. In 2003, Rangen filed a delivery call with the Idaho Department of Water Resources. The Department disposed of Rangen's 2003 delivery call through the Second Amended Order, filed May 19, 2005.

11. In the Second Amended Order, the Department concluded:

    a. Despite the issuance of a license and entry of a partial decree for water right no. 36-7694, the water right has no history of beneficial use. The authorized diversion rate was based on a flow estimate (rather than an actual measurement) made

EXHIBIT A

nearly five years prior to the application's filing date. Second Am. Order at 14, ¶62, (May 19, 2002).

b. Rangen is not entitled to call for water under water right no. 36-07694 because water was unavailable on the date of appropriation. Second Am. Order at 14-15, ¶ 63.

c. Rangen's measurements are systematically low, reflecting about a 10% under-measurement. Second Am. Order at 18, ¶76.

d. Rangen's water supply from the Curren Tunnel experiences intra-year variability. Second Am. Order at 13, ¶ 57.

e. These intra-year variations were present at the time of appropriation and form a functional limit of the amount of water that Rangen can call for, above and beyond the decreed amount. Second Am. Order at 14, ¶61. Put another way, Rangen's entitlement to 48.4 cfs from water right no. 36-02551 is framed by the intra-year variation in flows, and does not establish a legal basis to call for that full amount year-round.

III. EASTERN SNAKE PLAIN AQUIFER AND THE DEPARTMENT'S GROUND WATER MODEL, ESPAM

12. The Eastern Snake River Plain Aquifer ("ESPA") is defined as the aquifer underlying an area of the Eastern Snake River Plain that is 170 miles long and 60 miles wide as delineated in the report, "Hydrology and Digital Simulation of the Regional Aquifer System, Eastern Snake River Plain, Idaho," United States Geological Survey Professional Paper 1408-F, (1992), excluding areas lying both south of the Snake River and west of the line separating Sections 34 and 35, Township 10 South, Range 20 East, Boise Meridian. The ESPA is also defined as an area having a common ground water supply. *See,* IDAPA § 37.03.11.050.

13. For purposes of evaluating this delivery call, the Director will limit his examination to the ESPA within the area of common ground water supply. IDAPA § 37.03.11.050.

14. The ESPA is predominately in fractured Quaternary basalt having an aggregate thickness that may, at some locations, exceed several thousand feet, decreasing to shallow depths in the Thousand Springs area. The ESPA fractured basalt is characterized by high hydraulic conductivities, typically 1,000 feet/day but ranging from 0.1 feet/day to 100,000 feet/day.

15. Based on averages for the time period from May of 1980 through April of 2002, the ESPA receives approximately 7.5 million acre-feet of recharge on an average annual basis from the following; incidental recharge associated with surface water irrigation on the plain (3.4 million acre-feet); precipitation (2.2 million acre-feet); underflow from tributary drainage basins (1.0 million acre-feet); and losses from the Snake River and tributaries (0.9 million acre-feet).

16. Based on averages for the time period from May of 1980 through April of 2002, the ESPA also discharges approximately 7.5 million acre-feet on an average annual basis through sources including complexes of springs in the Thousand Springs area, springs in and near American Falls Reservoir, and the discharge of nearly 2.0 million acre-feet annually in the form of depletions from ground water withdrawals.

17. From the pre-irrigation conditions of the 1860s until the 1950s, the amount of water diverted from the Snake River and its tributaries for gravity flood/furrow irrigation increased substantially, from about 8 million acre-feet, or less, in the early 1900s to about 9.5 million acre-feet in the early 1950s. USGS Professional Paper 1408-F, at F14. Significant quantities of the surface water diverted were in excess of crop consumptive uses and provided incidental recharge to the ESPA above the average incidental recharge of 3.4 million acre-feet described in Finding of Fact no. 15 for the May 1980 through April 2002 time period. Ground water levels across the ESPA responded by rising at many locations. For example, the average rise in ground water levels near Jerome, Idaho, and near Fort Hall, Idaho, was 20 to 40 feet over several tens of years. The average rise in ground water levels west of American Falls may have been 60 to 70 feet. USGS Professional Paper 1408A, at A40. As a result, spring discharges in the Thousand Springs area correspondingly increased based on USGS data.

18. Beginning in about the 1960s to 1970s time period through the most recent years, the total combined diversions of natural flow and storage releases above Milner Dam for irrigation using surface water supplies have declined from an average of nearly 9 million acre-feet annually to less than 8 million acre-feet annually, notwithstanding years of drought, because of conversions from gravity flood/furrow irrigation to sprinkler irrigation in surface water irrigation systems and other efficiencies implemented by surface water delivery entities. The measured decrease in cumulative surface water diversions above Milner Dam for irrigation reflects the fact that less water is generally needed in the present time to fully irrigate lands authorized for irrigation with a certain crop mix under certain climatic growing conditions than was needed in the 1960s to 1970s for the same lands, crop mix, and climatic growing conditions. With parallel appropriations of ground water, which dramatically increased beginning in about 1950, ground water levels across the ESPA have responded by declining at most locations where levels had previously risen, exacerbated by the worst consecutive period of drought years on record for the upper Snake River Basin. As a result, spring discharges in the Thousand Springs area have correspondingly declined based on USGS data.

19. The ground water in the ESPA is hydraulically connected to the Snake River and tributary surface water sources at various places and to varying degrees. One of the locations at which a direct hydraulic connection exists between the ESPA and springs tributary to the Snake River is in the Thousand Springs area.

20. Hydraulically-connected ground water sources and surface water sources are sources that within which, ground water can become surface water, or surface water can become ground water, and the amount that becomes one or the other is largely dependent on ground water elevations.

21. When water is pumped from a well in the ESPA, a conically-shaped zone that is drained of ground water, termed a cone of depression, is formed around the well. This causes surrounding ground water in the ESPA to flow to the cone of depression from all sides. These depletionary effects propagate away from the well, eventually reaching one or more hydraulically-connected reaches of the Snake River and its tributaries, including springs in the Thousand Springs area. When the depletionary effects reach a hydraulically-connected reach of the Snake River or the points of discharge for springs in the Thousand Springs area, reductions in flow begin to occur in the form of losses from the river, reductions in spring discharge, or reductions in reach gains to the river. The depletions to the Snake River and its tributaries increase over time, with seasonal variations corresponding to seasonal variations in ground water pumping, and then either recede over time, if ground water pumping from the well ceases, or reach a maximum over time beyond which no further significant depletions occur, if ground water pumping from the well continues from year to year. This latter condition is termed a steady-state condition.

22. Various factors determine the specific hydraulically-connected reach of the Snake River or spring complexes affected by the pumping of ground water from a well in the ESPA; the magnitude of the depletionary effects to a hydraulically-connected reach or spring complex; the time required for those depletionary effects to first be expressed as reductions in river flow or spring discharge; the time required for those depletionary effects to reach maximum amounts; and the time required for those depletionary effects to either recede, if ground water pumping from the well ceases, or reach steady-state conditions, if ground water pumping continues. Those factors include the proximity of the well to the various hydraulically-connected reaches or springs, the transmissivity of the aquifer (hydraulic conductivity multiplied by saturated thickness) between the well and the hydraulically-connected reach of the Snake River or springs, the riverbed hydraulic conductivity, the specific yield of the aquifer (ratio of the volume of water yielded from a portion of the aquifer to the volume of that portion of the aquifer), the period of time over which ground water is pumped from the well, and the amount of ground water pumped that is consumptively used.

23. The time required for depletionary effects in a hydraulically-connected reach of the Snake River or tributary springs to first be expressed, the time required for those depletionary effects to reach maximum amounts, and the time required for those depletionary effects to either recede, if ground water pumping from the well ceases, or reach steady-state conditions, if ground water pumping continues, can range from days to years or even decades, depending on the factors described in Finding of Fact no. 22. Generally, the closer a well in the ESPA is located to a hydraulically-connected reach of the Snake River or tributary springs, the larger will be the flow reductions in the hydraulically-connected reach or springs, as a percentage of the ground water depletions, and the shorter will be the time periods for depletionary effects to first be expressed, for those depletionary effects to reach maximum amounts, and for those depletionary effects to either recede or reach steady-state conditions. However, essentially all depletions of ground water from the ESPA cause reductions in flows in the Snake River and spring discharges equal in quantity to the ground water depletions over time.

24. The Department uses a calibrated ground water model to determine the effects on the ESPA and hydraulically-connected reaches of the Snake River and its tributaries from pumping a single well in the ESPA, from pumping selected groups of wells, and from surface water uses on lands above the ESPA.

25. In 2004, in collaboration with the Idaho Water Resources Research Institute ("IWRRI"), University of Idaho, U. S. Bureau of Reclamation ("USBR"), USGS, Idaho Power Company, and consultants representing various entities, including certain entities relying on the discharge of springs in the Thousand Springs area, the Department completed reformulation of the ground water model used by the Department to simulate effects of ground water diversions and surface water uses on the ESPA and hydraulically-connected reaches of the Snake River and its tributaries, including springs in the Thousand Springs area. This effort was funded in part by the Idaho Legislature and included significant data collection and model calibration intended to reduce uncertainty in the results from model simulations. The model development process led to the Enhanced Snake Plain Aquifer Model Version 1.1 (ESPAM1.1). Subsequently, the agencies and water community involved in the development of ESPAM1.1 modeling have continued with data gathering and model improvement. In July 2012, the development and calibration of ESPAM Version 2.0 was completed. In November 2012, recalibration of the model due to an error in the water-budget parameters in the Mud Lake area was completed, resulting in ESPAM Version 2.1 (ESPAM2.1).

26. Below Milner Dam, the Snake River is incised and springs in the Thousand Springs area emanate from the canyon wall. In ESPAM1.1, the Thousand Springs area was divided into six adjacent groupings of spring complexes, or spring reaches, based on the relative magnitude of spring discharge. In ESPAM2.1, individual springs or small groups of springs have been added to the model as calibration targets. To provide additional calibration targets for ESPAM2.1, the springs are aggregated into three spring reaches based on the existence of gages on the Snake River: (1) Kimberly to Buhl; (2) Buhl to Lower Salmon Falls; and, (3) Lower Salmon Falls to King Hill.

27. There are 14 individual spring calibration targets in ESPAM 2.1. These targets have been categorized into three groups based on the nature of the available data: (1) Group A springs are measured by the USGS or the IDWR; (2) Group B springs are measured by water users and reported to IDWR; and (3) Group C springs are not routinely measured.

28. The spring calibration target that includes the Martin-Curren Tunnel from which Rangen diverts surface water is the Rangen spring cell, a Group B spring, in the Buhl to Lower Salmon Falls spring reach.

29. The ground water model for the ESPA was calibrated to recorded spring discharge described in Finding of Fact no. 27, ground water levels in the ESPA, and reach gains or losses to Snake River flows, determined from stream gages together with other stream flow measurements for the period May 1980 to October 2008. The calibration targets, consisting of measured ground water levels, reach gains/losses, and discharges from springs, have inherent uncertainty resulting from limitations on the accuracy of the measurements. The uncertainty in results predicted by the ESPA ground water model

cannot be less than the uncertainty of the calibration targets. The calibration targets having the maximum uncertainty are the reach gains or losses determined from stream gages, which although rated "good" by the USGS, have uncertainties of up to 10 percent.

30. Discharges from springs described in Finding of Fact no. 27 have diminished because of significant reductions in incidental recharge of the ESPA from surface water irrigation resulting from changes in surface water irrigation systems and application practices (conversion from application by gravity flood/furrow irrigation to application by sprinkler systems), and consecutive years of drought. For example, decreases in the springs supplying the Rangen hatchery facilities can be correlated with repairs made to the facilities of the North Side Canal Company to reduce losses of surface water to ground water from the canal company's facilities above those springs in 1987, 1998, and 2000.

31. Spring discharges are also reduced as a result of ground water withdrawals from the ESPA for irrigation and other consumptive purposes, especially ground water that is diverted in relatively close proximity to the area of the springs. Simulations using the Department's calibrated computer model of the ESPA show that ground water withdrawals from certain portions of the ESPA for irrigation and other consumptive purposes cause depletions in the flow of springs described in Finding of Fact no. 27. When superimposed on diminished spring discharges resulting from changes in surface water irrigation and drought, reductions in spring discharges caused by ground water depletions under relatively junior priority water rights can potentially cause injury to senior priority water rights dependent on spring sources

32. The Department is implementing full conjunctive administration of rights to the use of hydraulically-connected surface and ground waters within the Eastern Snake River Plain consistent with Idaho law and available information. The results of simulations from the Department's ground water model are suitable for making factual determinations on which to base conjunctive administration of surface water rights diverted from the Snake River and its tributaries and ground water rights diverted from the ESPA.

33. The Department's ground water model represents the best available science for determining the effects of ground water diversions and surface water uses on the ESPA and hydraulically-connected reaches of the Snake River and its tributaries. There currently is no other technical basis as reliable as the simulations from the Department's ground water model for the ESPA that can be used to determine the effects of ground water diversions and surface water uses on the ESPA and hydraulically-connected reaches of the Snake River and its tributaries.

IV. RANGEN'S DECREES

A. Terms of Rangen's Decrees

34. Rangen's partial decrees for water rights nos. 36-2551 and 36-7694 were entered by the Snake River Basin Adjudication ("SRBA") court in December of 1997. The partial decree for water right no. 36-02551 (Ex. 1026) provides that Rangen:

a. is entitled to 48.54 cfs from the Martin-Curren Tunnel;

b. may divert from a point or points established within a described 10 acre parcel in the SESWNW of Section 32, Township 7 South, Range 14E ("10 acre tract").

c. may use the water it diverts within a described place of use that roughly describes the outer boundaries of the Rangen hatchery facility.

d. is limited to a facility volume of 123,272 cubic feet.

35. Under the partial decree for water right no. 36-07694, Rangen is entitled to an additional 26 cfs from the same source, same point of diversion and for the same place of use. Water right no. 36-07694 right is limited to an increased facility volume of 287,640 cubic feet. Ex. 1028.

B. Rangen historical flow data associated with Rangen's use of its partially decreed water rights.

36. Pocatello's Expert Witness, Gregory Sullivan presented hydrographs compiling available flow data for both the Martin-Curren Tunnel flows and all physical flows measured below the CTR Raceways.

a. Mr. Sullivan's testimony included a discussion of the nature of the available flow data, including measurement problems, times when measurement techniques (or rating tables) changed, and the periods of time during which Rangen's flow data included other water rights.

b. Mr. Sullivan presented analyses of Rangen's total physical flows measured at the Lower Diversion as well as the flows at the Martin-Curren Tunnel. *See, e.g.*, Ex. 3656.

c. For purposes of these findings, the Department has focused on the Martin-Curren Tunnel flow data, because this is the source of water protected by Rangen's partial decrees. Ex. 1026, 1028.

i. The Martin-Curren Tunnel is also the source for a number of irrigation rights that are senior to Rangen's aquaculture rights.

ii. From 1966-1975 total Rangen flow measurements included the senior irrigation rights that then received water through the Martin-Curren Tunnel. Sullivan, Vol. VI, pp. 1369:1-1370:12; Sullivan,Vol. VII, 1505:12-1506:18. Ex. 3650, Figure 2-6b, Ex. 3334.

iii. Mr. Sullivan's investigations concluded that much of the Rangen flow data during the historical period and up until the 1980s included the flows at the Martin-Curren Tunnel destined for the farmers. Sullivan, Vol. VII, 1508:9-1509:3.

d. Flows at the Curren Tunnel have ranged from approximately 50 cfs in 1971 to approximately 4 cfs today. Exhibit 3650, Figure 2-6b, Figure 2-5c. However, at all times the amounts available vary seasonally, with the higher flows available in the fall; lower flows available in the spring and summer. *Id.*

e. The flows at the Curren Tunnel have declined steadily since approximately 1977. The average annual flow in 1977 was 33 cfs; the flow dropped to 11 cfs in 1981 and to 7 cfs in 1992. It has also increased from time to time–for example, the flows increased from an average annual of 7 cfs in 1992 to 17 cfs in 1997.

f. Today the average annual flow at the Curren Tunnel is 4.4 cfs and the flows range from approximately 4.4 cfs to 10 cfs. *Id.*

37. Rangen has never relied solely on its Martin-Curren Tunnel source to produce fish and has always relied on the additional, undecreed source at the Lower Diversion. Exhibit 3286. Kinyon, Vol. II, 472:22-474:8.

38. As the Department found in 2005, Rangen has no history of beneficial use of water right no. 36-07694. *See* ¶ 11, *supra*.

39. This is borne out by examination of Exhibit 3334, which—while it includes spring flows measured at more than 70 cfs—also includes water that was not delivered to Rangen because it was used by the senior irrigation rights.

40. Thus, even Rangen's total physical supply diverted by Rangen (i.e., the amounts available to Rangen from the Martin-Curren Tunnel plus those received at the large raceway diversion) historically has never been adequate to satisfy water right no. 36-7694. Ex. 1028, 3656; Sullivan, Vol. VI, 1369:1-1370:12.

41. Evidence received into the record in this captioned matter supports the Department's continued finding on this point, and the Director concludes that at no time in the historical record did the Martin-Curren Tunnel supply water to satisfy Rangen's water right no. 36-7694.

42. As a result, Rangen never developed reliance on water right no. 36-07694 as part of its physical supplies.

43. By contrast, various exhibits received into evidence in this case establish that Rangen has relied on its water right no. 36-2551 at various points in the past. *See,* Ex. 3650, Figure 2-6b; Sullivan, Vol. VI, 1369:1-1370:12. However, available water supplies routinely varied seasonally, and during low flow periods dipped as low as 12 cfs between 1966-1975 on a seasonal basis. *Id.*

44. A senior's pattern of reliance on all or a portion of a water right that a senior claims is injured is among the threshold tests for inquiring into claims of shortage in a conjunctive management delivery call. Memorandum Decision and Order on Petition for Judicial Review at 30, *A&B Irrigation District v. Idaho Department of Water Resources*, Case No. 2009-000647 (May 4, 2010); *see also*, Conclusions of Law ¶I

45. Based on evidence in the record regarding flows at the Martin-Curren Tunnel, the Department will consider Rangen's request for delivery call for the amounts of water identified in water right no. 36-02551. However, Rangen's water right no. 36-07694 will not be among the rights considered by the Department in response to Rangen's delivery call.

46. In addition, Rangen's water right no. 36-07694 is junior to Rangen's water right no. 36-02551 and would be among the rights curtailed in the event the Director orders curtailment. For that reason, water right no. 36-07694 cannot be among the rights considered to be injured.

C. Means of diversion

47. Rangen has three means of diversion.

    a. A 6" white PVC pipe ("White Pipe") which diverts water from within the Martin-Curren Tunnel and delivers the water to the hatch-house and greenhouse buildings, and for domestic use. Ex. 1291, 3278; Sullivan, Vol. VI, 1340:11-14.

    b. Water beyond that diverted by the White Pipe is delivered from the Martin-Curren Tunnel through pipes to a collection box known as the "Rangen Box" about 100 feet downhill of the Martin Curren Tunnel. Ex. 3278, 1292, 3651. A 12" steel pipe ("Steel Pipe") delivers water from the Rangen Box to the small raceways. Ex.3277, 1290; Sullivan, Vol. VI, 1339:21-1340:10.

    c. Rangen also collects water from spring flow below the Martin-Curren Tunnel and Rangen Box and delivers it to the large raceways and CTR raceways by means of a 36 inch pipe (the "Lower Diversion" or "Large Raceway Diversion"). Ex. 2286, 3651, 3277, 1290; Sullivan, Vol. VI, 1346:19-1347:15.

48. Of these three means of diversion, only the White Pipe and Steel Pipe carry water diverted from the Martin-Curren Tunnel. Ex. 3651; Ramsey, Vol. III, 707:23-708:16.

49. In addition, only the White Pipe and Steel Pipe are diversion structures within the 10 acre tract described point of diversion.

D. Source of water under Rangen's decrees.

50. Rangen's decrees identify the source of water as the "Martin-Curren Tunnel." Ex. 1026, 1028; *see also* Ex. 1291, 3278, 1292.

51. The Director determined through the April 22, 2013 "Order Granting in Part and Denying in Part Rangen's Motion for Summary Judgment Re: Source" ("Source Order") in this matter that the plain language of Rangen's decrees controls, and that the source is limited to the Martin-Curren Tunnel. For purposes of these findings of fact, the Department concludes, based on the plain language of the partial decrees in addition to the prior Order of the Director, that the source of water subject to Rangen's partial decrees is limited to water arising at the Martin-Curren Tunnel. Ex. 1026, 1028.

52. The amounts of water available from the Martin-Curren Tunnel are reflected in data collected by IDWR and, for periods prior to 1993, through a regression analysis conducted by Mr. Sullivan. Ex. 3650, 3654.

53. Despite the Director's pre-trial order and the plain language of its decrees, Rangen has asserted that its decreed source should include both the Martin-Curren Tunnel supply and amounts arising from springs within the 10 acre tract but not captured by the existing structures that deliver Martin-Curren tunnel water to the Rangen hatchery.

54. Rangen's witness, Dr. Charles Brockway, attempted to quantify physical water supplies that arise outside of the Martin-Curren Tunnel. Ex. 1446A-D.

   a. The apparent purpose of this analysis was to demonstrate that some of the water collected at the Lower Diversion was water arising on the 10 acre tract and/or water from the Martin-Curren Tunnel.

   b. However, Dr. Brockway's analysis involved measuring physical water supplies discharging from pipes to the headwater channel of Billingsley Creek. Brockway, Vol. IV, 982:12-983:22.

   c. At the same time, Rangen staff made a routine water measurement at the Lodge Dam and CTR raceways. Brockway, Vol. IV, 984:11-985:10.

   d. Dr. Brockway subtracted the amounts of water measured from the pipe discharges in the vicinity of the headwater channel of Billingsley Creek (which he agreed was outside of the 10 acre tract) from the total flow measured by Rangen staff at their routine measuring points at the bottom of the facility. Ex. 1446B.

   e. In this way, Dr. Brockway claimed to have calculated the water supplies arising from the 10 acre tract.

   f. These pipes are all outside of the 10 acre tract.

   g. Dr. Brockway did not measure springs either from within or without the 10 acre tract, but only the discrete pipes identified on his map, Ex. 1446C.

   h. On cross-examination, Dr. Brockway admitted he did not measure any spring flows within the 10 acre tract or outside of it. Brockway, Vol. V, 1046:14-1047:8, 1058:14-16.

   i. In testimony involving Exhibits 1446A-C, Dr. Brockway concluded that all but one of the springs he identified arise below the Martin Curren Tunnel. Brockway, Vol. X, 2351:24-2352:12.

55. The Director concludes that Dr. Brockway's methodology, while well meaning, was flawed and is insufficient to contribute to an understanding of the amounts of water available to Rangen arising from the talus slope generally, and the 10 acre tract specifically.

56. Rangen presented photographs that showed spills from the Rangen Box (the point at which the Steel Pipe diverts Martin-Curren Tunnel water supplies). Exhibit 1458. Mr. Sullivan agreed that the spill from the Rangen Box could be prevented by blocking the spill and allowing the water to be delivered to the Rangen hatchery via the Steel Pipe. Sullivan, Vol. VII, page 1653:4-1654:4.

E. Rangen's fish rearing facilities, generally

57. As shown in Exhibits 1290, 2286 and 3277, Rangen has fish rearing facilities of several types:

    a. The hatch-house, an indoor facility where eggs are hatched in incubators and reared in troughs until they are 2 ½ to 3 inches long. Smith, Vol. III, 772:5-9.

    b. The greenhouse, an indoor facility with different size tanks where fish of all sizes may be reared for research purposes. Ramsey, Vol. V. 1203:13-21.

    c. The small raceways, where fish are reared from about 3 inches to six inches in length. Smith, Vol. III, 772:5-12, 781:11-12.

    d. The large raceways, where fish are reared from about six inches in length to ten inches, the size required under the Idaho Power Contract. Smith, Vol. III, 781:11-12; Tate, Vol. IV, 856:4-6.

    e. The CTR raceways, which are used to rear leftover fish which are not sold to Idaho Power. These fish are over ten inches in length. Smith, Vol. III, 782:11-23.

58. The capacities of the raceways are as follows:

    a. The hatch-house requires 312 gallons per minute total to operate (12 troughs times 26 gpm each). The maximum carrying capacity of the hatch house is about 138,000 eggs per lot. Rogers, Vol. VIII, 1801:7-20, 1818:17-21.

    b. The greenhouse requires 160 gallons per minute to be fully utilized. Woodling, Vol. VI, 1238:14-19.

    c. The small raceways have a maximum capacity of 8.1 cfs for all the raceways. Rogers, Vol. VIII, 1818:22-24.

    d. The large raceways can "ideally" use about 5 c.f.s. each, there are ten large, so the total capacity is about 50 c.f.s. Ramsey, Vol. V, 1206:16-21.

    e. The CTR raceways are supplied with second use water from the large raceways, so their capacity is limited to that of the large raceways. Ex. 1290.

V. HISTORICAL AMOUNTS OF WATER AVAILABLE TO RANGEN

A. Flow data

59. The red line on Exhibit 3650, Figure 2-7, shows the total Martin-Curren Tunnel flow that was delivered to Rangen from 1993-2011.

60. The blue line on Exhibit 3650, Figure 2-7 shows the total flow of the Rangen spring complex as measured (by Rangen) at the measurement point at the bottom of the fish hatchery.

61. These figures can be compared to Figure 2-5A, Exhibit 3650, which reflects predicted flows at the Martin-Curren Tunnel from 1966-1992.

62. Figures 2-7 and 2-5A, Exhibit 3650, show overall trends in flows from the Martin-Curren Tunnel specifically and from the Rangen spring complex overall over time.

63. Figure 2-6A, Exhibit 3650, shows the seasonal variation in Rangen's physical spring supply over time.

64. Figure 1, Exhibit 3650 shows the regression relationship between data at the Martin-Curren Tunnel and that measured at the bottom of the hatchery facility. Sullivan, Vol. VI, 1364:16-1366:16.

65. However, as discussed below, the Rangen facility has experienced inaccuracy in its collection of flow data. Mr. Sullivan corrected the historical flow data used in the regression equation to account for the 15% under-measurement, and re-ran the regression analysis. Exhibit 3654, Figure 1, demonstrates that the Martin-Curren Tunnel flow is roughly 63% of the total flow at the Rangen facility, using corrected measurement data. Sullivan Vol. XII, 2797:20-2798:10.

66. From these plots, the Director concludes that Rangen has always experienced seasonal variation in its physical supplies.

67. The Director also concludes that Rangen has experienced declining rates of flow in the springs it has utilized for its fish hatchery operations.

B. Measurement problems

68. In 2003, IDWR staff identified problems with Rangen's measurement of its flows. Exhibit 1129. Testimony showed that the problems identified by IDWR in 2003 were the result of IDWR employing the weir coefficient for a sharp-crested weir of 3.33 rather than a broad-crested weir coefficient of 3.09. Yenter, Vol. II, 566:7-11, 583:17-586:25; Exhibit 1449.

69. Water measurement using a standard weir involves two steps. First, the "head" or energy of water behind a structure like a weir is determined by measuring the depth of flow where the velocity is relatively low. The second step is to convert the head measurement to flow using either a standard weir equation or a rating table generated from a weir equation or derived empirically in the field. Sullivan, Vol. VI, 1380:10-16.

70. An accurate head measurement can be obtained by measuring at a standard distance behind the weir. Measuring head at an appropriate distance behind the weir is important to ensure that the energy in the flow of water is potential (elevation head) rather than kinetic (velocity head); as the water approaches the weir and picks up speed, more of the energy is converted to kinetic energy. Measuring head at a location too close to the weir—in other words where more of the energy is kinetic rather than potential—can result in systematic under-measurement of the head and therefore the flow. Sullivan, Vol. VI, 1386:9-1387:20, 1433:6-8.

71. These measurement principles apply to standard measuring devices.

72. Rangen uses a non-standard measuring device, because its measurements have been taken by placing a ruler on a dam board, rather than a standard distance back from the weir. This is known as the "stick the weir" method. Brockway, Vol. IV, 996:15-997:12.

73. "Sticking the weir" involves putting a ruler on top of a dam board at the bottom of a raceway and turning the ruler perpendicular into the direction of the water flow. Brockway, Vol. IV, 998:3-6.

74. The combination of the ruler on the dam board along with the turning of the ruler into the flow of the water is intended to slow down the flow of water to replicate the energy present in the water at a standard distance upstream where the head associated with flow over a standard measuring device would be measured. Sullivan, Vol. VI, 1387:1-1388:4; Yenter, Vol. III, 590:11-23.

75. There was no disagreement that the "stick the weir" measurement method could be an adequate methodology to achieve accurate measurements if adequate safeguards are taken by measurement personnel to ensure that the ruler is turned into the flow of the water. However, Mr. Sullivan testified that "sticking the weir" is likely to result in under-measurement. Sullivan, Vol. VI, 1388:22-1389:8.

76. There was no disagreement that Rangen's use of the "stick the weir" method was acceptable. Sullivan,Vol. VI, 1388:5-1389:12.

77. However, a head measurement made using adequate measurement methodology is insufficient by itself to render an accurate flow measurement. The head measurement must be converted to flow using a rating table or the standard weir equation, and if the rating table is inaccurate or not calibrated to the non-standard measuring device, unreliable measurements will result. Yenter, Vol. III, 581:2-7.

78. Testimony demonstrated that the Rangen rating table is of unknown provenance. Brockway, Vol. IV, 1004:16-23; Maxwell, Vol. II, 310:5-7.

79. Further, the weir coefficient used by Rangen varied, but was between 2.8 and 3.15. Sullivan, Vol. VI, 1394:13-1395:2. A coefficient of 3.09 is that used with standard broad-crested weirs. There was no dispute that measuring the flow over dam boards more closely approximates a sharp-crested weir, which requires use of a coefficient of 3.33.

80. Further, Dr. Brockway's initial report stated that the Rangen rating table includes two "step functions" at H=.18 and .32 feet for "no apparent reason." Exhibit 1284, page 40. Mr. Sullivan's analysis confirmed the existence of step functions in the rating table. *See* Ex. 3325, Figures 1-3, 1-4, 1-5, 1-6. Step functions are unusual in a rating table. Sullivan, Vol. VI, 1378:16-21.

81. A rating table with step functions suggests that the weir coefficient is not consistent throughout all flows. *See* Ex. 3325, Figures 1-3, 1-4, 1-5, 1-6.

82. Given the concerns about Rangen's rating table and the potential for under measurement of the flows, Mr. Sullivan performed an evaluation of Rangen measurements against those collected by USGS below the Rangen hatchery. Ex. 3358; Sullivan, Vol. VI 1414:14-1416:6.

83. USGS measures at the bridge immediately below the Rangen Hatchery. Exhibit 3650, Figure 2-3; Sullivan, Vol. VI, 1417:20-1418:15.

84. The results of Mr. Sullivan's analysis of the USGS and Rangen flow data showed a systematic undermeasurement of Rangen's flows of around 15.9% based on comparison of 45 measurements made by the USGS between 1980 and 2013. Sullivan, Vol. VI, pages 1428:12-1430:2. Ex. 3345, Figure 2-4.

85. There was an effort by IDWR in 2006 to install a standard measuring device at this location to collect data for purposes of the ESPAM 2.0 modeling effort; Rangen refused to allow the installation of the standard measuring device. Exhibit 1130; Courtney. Vol. I, 114:22-115:20.

86. However, because IDWR previously concluded that this was an appropriate measurement location to obtain data from Rangen's total physical flows, the USGS measuring location is close enough to the Rangen Hatchery to make the data comparable.

87. IDWR has employed its Standards for Water Measurement, Exhibit 2131, to evaluate non-standard measuring devices. Non-standard devices that show a 10%+/- measurement error are considered to be adequate. Rangen's measurements are systematically low by approximately 15.9% according to Mr. Sullivan's analysis. Sullivan, Vol. VI, 1428:12-1430:2.

88. In addition to evaluating the extent of under-measurement by Rangen, Mr. Sullivan derived a weir coefficient for the Rangen facilities by solving the standard weir equation for the weir coefficient using the USGS flow measurements and Rangen head measurements made nearest in time (within a few days). Mr. Sullivan derived a weighted average weir coefficient of 3.62. Sullivan, Vol. VI, 1438:21-1439:14.

VI. AMOUNTS RANGEN HAS DIVERTED FOR BENEFICIAL PURPOSES

89. Rangen currently produces fish for three beneficial purposes: First, conservation fish are produced under a contract with the Idaho Power Company; Second, leftover Idaho Power

fish are sold for commercial processing; and finally research is performed on the Idaho Power Fish. Kinyon, Vol. II, 422:2-23; Tate, Vol. IV, 855:11-15.

A. Conservation Fish

90. In 2004 Rangen entered into a written contract with the Idaho Power Company to produce fish to meet mitigation requirements on the Middle Snake River and at American Falls Reservoir. Ex. 1141. The Idaho Power company uses the fish it purchases from Rangen to fulfill mitigation requirements for its facilities on the Middle Snake River and in American Falls Reservoir ("conservation fish"). Kinyon, Vol. II, 422:7-20.

91. In the past Rangen raised seven lots of eggs per year. Maxwell, Vol. II, 323:10-18. Now Rangen currently raises three lots of fish per year, primarily for Idaho Power. The timing of these lots is based on the timing of delivery required under a contract with the Idaho Power Company. Maxwell, Vol. II, 316:18-24; Tate, Vol. IV, 860:6-861:2.

92. The timing component of the contract is somewhat complicated by the fact that the special triploid eggs required under the contract must be ordered a year and a half in advance. Tate, Vol. IV, 859:3-6.

93. A density index is a measurement of the relationship between the number and size of fish and the volume of available rearing area, while a flow index is a measurement of the relationship between the number and size of fish and the flow of water in a rearing vessel. Ramsey, Vol. III, 721:16-726:12; Smith, Vol. IV, 812:5-813:7. The formulas for calculating each are shown on Exhibit 1450.

94. Under the contract with Idaho Power Rangen is required to maintain certain flow and density indexes in regard to any fish delivered. Kinyon Vol. II, 448:23-449:11. Rangen must maintain a flow index of .8 and a density index of .3. Ramsey, Vol. III, 649:2-8.

95. The Idaho Power Contract indices can be compared to those that Rangen's expert Charlie Smith found would be safe absent the contract; a flow index of 1.1 and a density index of 1.0-2.0. Smith, Vol. IV, 818:13-25, 822:18-823:2. Accordingly, the flow and density requirements of the Idaho Power contract significantly reduce the number of fish Rangen can produce.

96. While the use of density and flow indices is standard in conservation hatcheries, it is not standard in the commercial industry. Ramsey, Vol. III, 726:5-12.

97. Rangen produces enough fish to meet the Idaho Power Contract, and plans to have fish leftover to sell on the commercial market at the end of each production cycle. Ramsey, Vol. III, 660:21-661:12.

98. No evidence was presented to indicate that Rangen has ever been unable to meet its contractual requirements to Idaho Power because of declining flows at the hatchery. On the contrary, testimony indicated that on the occasion that Rangen did fail to meet one of the Idaho Power indices it was caused by a failure to move fish at the correct time, rather

than by low flows. Sullivan, Vol. VII, 1650:3-12. Accordingly, the Department finds that there is no injury to Rangen's use of water for conservation production purposes.

B. Commercial production

99. In contrast to conservation fish, commercially raised fish are raised under "intensive fish culture" which utilizes higher densities to produce more fish. A conservation fish requires more water to produce than a commercial fish. Rogers, Vol. VIII, 1832:19-1833:2.

100. The fish that are "leftover" after the Idaho Power contract is fulfilled are grown to commercial size and sold to commercial processors. Ramsey Vol. III, 661:7-12; Tate, Vol. IV, 858:1-4.

101. Because Rangen's "commercial" fish are leftover conservation fish, they are raised at densities lower than those in commercial hatcheries. Tate, Vol. IV, 875:17-876:13.

102. Rangen claims that it wants to raise as many fish as possible while staying within the Idaho Power indices and timing requirements. Tate, Vol. IV, 866:3-7.

103. Commercial hatcheries monitor dissolved oxygen closely. Rogers, Vol. VIII, 1829:5-15. However Rangen does not closely monitor dissolved oxygen - it has no regular monitoring schedule. Instead Rangen tries to take oxygen measurements "at least quarterly." Maxwell, Vol. II, 319:22-320:6.

104. Rangen does not use all of their available facilities for production, even when there is water in those facilities. For example, the CTR raceways are only used for overflow fish to maintain Idaho Power contract densities, and are never filled to capacity. Rangen's fish expert Charlie Smith testified that when he visited in May there were "very few fish" in the CTRs, and that Rangen has so much room in the CTRs that "they are never overloaded as far as space." Smith, Vol. III, 782:7-783:3. Rangen could raise more fish if it did fill those raceways to capacity with fish. Tate, Vol. IV, 876:14-877:6.

105. Rangen used to rent additional rearing space in offsite hatchery facilities. These facilities were referred to as the "Woods Ponds" and "Decker Springs." Tate, Vol. IV, 878:4-6; Kinyon, Vol. II, 485:4-486:12. These off-site facilities, along with others, were used by Rangen to produce fish for commercial processors. Kinyon, Vol. II, 485:4-486:12; Tate, Vol. IV, 877:22-878:3. However, Rangen experienced difficulties in marketing the fish reared in the Woods and Decker Pond facilities and in 2002 or 2003 declined to renew the leases. Tate, Vol. IV, 878:17-880:22.

106. During the historical period when these leases were in place, the total physical flow relied on at the Rangen facility was in excess of 20 cfs, and generally in excess of 30 cfs. Exhibit 3656.

107. In Mr. Rogers's expert opinion, a facility claiming to raise fish commercially (as Rangen does), but doing so at conservation densities is wasting water. Rogers, Vol. VIII, 1848:20-1849:16. Mr. Rogers's based his opinion on over 37 years working in Idaho Fish & Game either designing, operating or managing fish hatcheries. Mr. Rogers testified to

lengthy experience in the conservation hatchery sector; however, his experience included work in the private hatchery sector during his career, and he testified that the skills, formulas, feed, and rearing methods are often the same in the commercial and conservation sectors. Rogers, Vol. VIII, 1779:1-21.

108. Rangen does not raise fish at commercial densities, nor does it maximize production for commercial purposes with existing water supplies. Additionally, Rangen made a business decision to cease commercial production when it stopped leasing offsite production facilities due to poor market conditions. Accordingly, the Department finds that Rangen is not a commercial scale fish producer, and cannot claim injury to a beneficial use it has not pursued at the facility for many years. If it was a commercial producer, it would be wasteful to rear commercial fish at conservation densities as Rangen does.

C. Research

109. Rangen performs research in three primary locations; the hatch-house, the greenhouse, and the outdoor raceways. Ramsey, Vol. III, 685:19-23.

110. It was established that Rangen currently has sufficient water to perform research in the hatch house or greenhouse year round, but during certain times of year it is "marginal" to operate both at once. Tate, Vol. IV, 894:16-895:7; Ramsey, Vol. III, 711:14-17; *see also* facility capacities in Finding of Fact no. 56, *supra.*

111. Rangen can also perform research in the small raceways during part of the year. Ramsey, Vol. III, 711:18-21.

112. A large raceway research project would require around 30 c.f.s. Mr. Ramsey did not know when Rangen last had enough water to conduct such a study. Ramsey, Vol. V, 1206:14-1207:8.

113. Rangen does not claim that it is impossible to do research at current flows, instead Rangen complains that it requires "a lot more coordination" and the "degree of complication has increased". Kinyon, Vol. II, 454:11-17, 460:19-23; Ramsey, Vol. III, 691:10-693:2. Despite Rangen's complaints about having to coordinate research timing with flows, Rangen was conducting research during the hearing in this matter which occurred in May. Kinyon, Vol. II, 459:3-25. May is a historically low flow time of year for the Rangen facility, based on historical hydrographs. Ex. 3650, Figure 2-6a.

114. While Rangen can conduct research in other areas of the facility, there was no dispute that Rangen is unable to conduct fully replicated feeding trials in the large raceways under current flow conditions. Accordingly, Rangen's primary claim of injury to its research beneficial use is that it is unable to perform research in the large raceways. Ramsey, Vol. III, 712:19-713:8; Kinyon, Vol. V, 1183:16-1184:2.

115. Pocatello and IGWA made discovery requests for research documents, and made a trip out to the Rangen Research Hatchery to review archived research reports and data. These documents were reviewed by experts, including Pocatello's research expert Dr. John

Woodling. Dr. Woodling concluded that Rangen has only rarely used the large raceways for research. Woodling, Vol. VI, 1240:14-18.

116. Rangen's research scientist Doug Ramsey did not contest Dr. Woodling's conclusion that few large raceways studies had been done, stating instead that he was "not able to explain" why there was no record of having done lots of raceway studies in the past. Ramsey, Vol. III 716:11-717:8.

117. Rangen produced an index of research projects containing 392 separate research projects which were recorded from 1984 to 2011. Ex. 1164; Ramsey, Vol. III, 672:23-673:14. Of these Dr. Woodling was only able to find records for thirteen total raceway studies, only two of which reached significant results, and these studies were conducted in the 1980s. Woodling, VI, 1240:14-1241:9.

118. Based on this history of use of the various Rangen facilities for research, Dr. Woodling concluded that flow was not an impediment to raceway research. Woodling, Vol. VI, 1240:14-1241:9.

119. Rangen's own records support Dr. Woodling's conclusions. The recent studies that Rangen has conducted in raceways ended with a recommendation that further large raceway studies not be undertaken because of "lack of sensitivity." Woodling, Vol. VI, 1246:1- 1248:19.

120. Rangen can currently conduct research at certain times each year in all areas of the facility except the large raceways. *See* Ramsey, Vol. III, 711:14-21. However, Rangen's historical operations have not relied on research conducted in the larger raceways. *See* Findings of Fact nos. 112-116. Rangen's research uses have not suffered material injury.

D. Rangen's operations are not efficient, and could be improved with basic infrastructure which is widely used in the aquaculture industry.

121. Mr. Rogers, an aquaculture expert with 37 years of experience in the industry, analyzed Rangen's fish culture practices and concluded that Rangen was not using water efficiently. Rogers, Vol. VIII, 1839:6-25. Mr. Rogers suggested a number of avenues Rangen could pursue to increase production using its current water supplies.

122. First, Mr. Rogers reviewed the capacities of each rearing unit at Rangen, and the monthly records produced for Idaho Power and concluded that Rangen could rear additional fish at every stage in the process, even under existing Idaho Power Contract requirements. Rogers, Vol. III, 1818:14-1824:24; 1881:25-1884:3.

123. Second, Rangen does not "load follow" - meaning that they do not use the peaks of the inherent seasonal highs at the facility to produce more fish. Ex. 3333, Rogers, Vol. VIII, 1829:22-1831:8. If Rangen purchased eggs more often during the year they could more closely follow their seasonal flow regime and produce more fish. Rogers, Vol. VIII, 1833:14-22.

124. Third, Mr. Rogers concluded that while oxygen is not currently an issue at Rangen, Rogers, Vol. VIII, 1827:25-1828:24, they could install aeration devices to fully utilize existing water supplies, allowing additional production. These options include low head oxygen injection systems, dropping the water over damboards to increase oxygenation, pumping water though an aeration tower, and aeration bubblers. Rogers, Vol. VIII, 1840:5-1843:9. Installation of aeration devices would allow Rangen to make the most out of their existing water supplies. Rogers, Vol. VIII, 1943:15-19.

125. Finally, Mr. Rogers summarized his experience at fish facilities that use pumps to either re-circulate or augment water supplies. He testified that such practices are commonly used in the industry and could be implemented at Rangen using equipment readily available on the market. Rogers, VIII, 1866:3-1872:11.

E. The amounts of fish that Rangen grows and the amount of research it conducts are not directly related to the quantities of water available

126. By comparing Rangen's production records to their flow records Mr. Sullivan was able to develop a graph, shown in Exhibit 3286. The graph demonstrates that there is little to no correlation between total flows at Rangen and number of fish produced. In certain periods of time production was increasing even as flows decreased, and in recent years production has declined sharply even as flows have remained relatively constant. *See* Ex. 3286. As recently as 2005 Rangen was producing nearly twice as many pounds of fish per c.f.s. of water as they were in 2008, although the average flow in these two years was not significantly different. *Id.*

127. Exhibit 3286 also shows Rangen's historic relationship between amount of water used and pounds of fish produced as pounds of production per c.f.s. IGWA's fish expert Tom Rogers confirmed that pounds of production per c.f.s. is a standard measurement of efficiency in the trout production industry, and there has been a general downward trend in this measurement at Rangen. Rogers, Vol. VIII, 1941:5-24.

128. Dr. Woodling's testimony also established that the amount of research Rangen conducts is not necessarily related to water flows. For example, at least some of the experiments that Rangen would like to conduct in the large raceways could be performed in the greenhouse. Ramsey, Vol. V, 1203:13-21. Nonetheless, Rangen has not conducted research in the greenhouse recently, despite the fact that there is available water year round. Woodling, Vol. VI, 1238:20-1239:2.

129. The Department concludes that, based on Rangen's record of beneficial uses and its failure to fully utilize its water supplies (both adjudicated and unadjudicated sources), the record does not support that if Rangen was provided additional water supplies it would produce more fish for conservation or commercial purposes, nor that it would conduct more research.

VII. AMOUNTS TO BE REALIZED FROM CURTAILMENT

130. Rangen has requested curtailment of all junior ground water rights on the ESPA with priority dates junior to 1962.

131. When Rangen made its first delivery call in 2003, ESPAM 1.1 modeled the amounts of water to be delivered to spring "reaches". Under the May 2005 Second Amended Order, the Department concluded that curtailment to satisfy Rangen's delivery call would be futile because the amounts to be realized in the spring reach were on the order of 0.4 cfs. The Director found that 0.4 cfs was not a meaningful increase in the quantity of discharge. Second Am. Order, ¶ 84.

132. Because of the changes included in ESPAM 2.1, it is now possible to model the amounts of water that will accrue to specific spring cells, including Rangen's Curren spring.

133. The IDWR Staff Memo presented information related to the amount of water realized at Rangen from curtailment of various portions of the Area of Common Ground water Supply ("CGW"). Ex. 3203, page 50.

134. Adopting Mr. Sullivan's analyses, the Department looked at curtailment from the standpoint of the fractional increase in flows at the Rangen spring cell. The "Area of Curtailment" section on Table 4 of page 50 of Exhibit 3203 refers uses the term "trimline". As a technical matter, the term CGW 1% trimline (for example), refers the geographic zone where 1% of the curtailed junior ground water pumping would have accrued at the Rangen.

135. The Staff Memo demonstrates that curtailment of junior ground water acres across the plain results in accrual at the calling senior water right in varying amounts, depending on the location of the junior acres.

136. Mr. Sullivan relied on the Department's Memo in developing maps and tables showing the effects of curtailment on Rangen's water supply. In Exhibit 3650, Figure 8-4a quantifies the results based on the amount of acres that would be curtailed in each zone. For example, the 10% zone includes approximately 6,100 acres that would be curtailed. Curtailment of those acres would result in an increase in flow at Rangen of around 0.2 cfs. In contrast, the 5% zone contains around 12,300 curtailed acres and curtailment of those acres would result in an increase at Rangen of around 3.33 cfs.

137. Mr. Sullivan concluded that curtailment of Pocatello's junior ground water rights would provide about .014 to .018 c.f.s. of water to Rangen at the Martin-Curren Tunnel. Sullivan, Vol. VII, 1483:17-1484:15.

138. The Staff Memo found that curtailment of Pocatello's junior ground water rights would result in a "negligible" amount of water. Ex. 3203 at 50. This opinion was echoed by Mr. Sullivan. Sullivan, Vol. VII, 1484:7-15. Mr. Kinyon agreed that the 5-8 gpm of water that would arrive at Rangen after 20 years of curtailment of Pocatello's junior ground water rights was "not a huge amount of water which would make a tremendous difference by itself in our hatchery operation." Kinyon, Vol. II, 494:23-495:6.

139. Mr. Justin Armstrong, Pocatello's water superintendent, testified that curtailment would work a hardship on Pocatello's treated water customers, particularly at the airport where the supplies are met solely by junior ESPA wells. Armstrong, Vol. V., 1108:23-1109:19.

In addition, the City's federally permitted biosolids program relies on junior ground water rights for its operation. Armstrong, Vol. V., 1103:2-9.

140. The Fremont-Madison Irrigation District presented similar information regarding the amounts of water to be realized at Rangen from curtailment of FMID's junior wells. Mr. Contor testified that 24 gallons total would accrue to Rangen (not 24 gpm) in the first year and that, after 150 years, Rangen would receive approximately 1.9 af of water from FMID's curtailment. Contor, Vol. XII, 2855:1-23.

141. However, the amounts of water *not* reaching Rangen are going somewhere—and Mr. Sullivan determined the locations of reach or spring gains from Rangen's requested curtailment in Exhibit 3650, Figure 2-1, and Table 2-1. This information demonstrates that, in the event of curtailment to satisfy Rangen's call, over 99% of the amounts of the water would accrue to other water rights.

   a. Of the 99% of flows that are *not* getting to Rangen, most of the water accruing to springs would accrue to spring water rights that are junior to Rangen's delivery call. Exhibit 3650, Table 2-1.

   b. Further, as Figure 2-1 shows, large quantities of curtailed ground water would accrue to river reaches that have mitigated delivery calls (such as the Blackfoot to Minidoka reach, which would receive 695 cfs additional) and junior or subordinated surface water rights that are not entitled to delivery under a 1962 priority date delivery call.

CONCLUSIONS OF LAW

142. The Director incorporates by reference all Findings of Fact to the extent they also reflect conclusions of law.

I. IDAHO LAW OF CONJUNCTIVE MANAGEMENT

143. In *AFRD#2*, the Idaho Supreme Court determined that in a delivery call the Director must give a partial decree proper legal effect by establishing a presumption that the senior is entitled to his decreed quantity. *American Falls Reservoir Dist. No. 2 v. Idaho Dept. of Water Resources* ("AFRD#2), 143 Idaho 862, 878, 154 P.3d 433, 449 (2007). "[T]he burden is not on the senior water rights holder to re-prove an adjudicated right." *Id.* However, "there certainly may be some post-adjudication factors which are relevant to the determination of how much water is actually needed." *Id.* The *AFRD#2* Court found that:

> The [Conjunctive Management] Rules do give the Director the tools by which to determine "how the various ground and surface water sources are interconnected, and how, when, where and to what extent the diversion and use of water from one source impacts [others].

AFRD#2, 143 Idaho at 878, 154 P.3d at 449 (internal citation omitted). The Idaho Supreme Court recently affirmed that a delivery call amounts to more than "shut and fasten" administration:

> An enforcement proceeding under federal interstate water law would be equivalent to the administration under Idaho water law only if there was enough water for all appropriators in Idaho to receive their decreed amounts. **Then, administration would simply be interpreting the decrees to determine what amounts had been decreed for each appropriator and measuring their diversions to make sure that the appropriators only took their decreed amounts. However, that is not reality**.

A & B Irr. Dist. v. Idaho Dept. Of Water Resources 153 Idaho 500, 524, 284 P.3d 225, 249 (2012) ("*A&B*"), (emphasis supplied).

Instead, a delivery call requires the Director to examine issues "such as whether the appropriator making the call is suffering material injury, the reasonableness of the appropriator's diversion, the appropriator's conveyance efficiency, whether the appropriator is putting the water to beneficial use, whether the appropriator is wasting water, and hydrology." *Id.* Upon a finding by the Director that the senior is suffering material injury, "the junior then bears the burden of proving that the call would be futile or to challenge, in some other constitutionally permissible way, the senior's call." *AFRD#2* at 878, 154 P.3d at 449.

144. By establishing that the senior is legally presumed to be entitled to the decreed quantity, the Director can implement an evaluation of the senior's requirements under the "doctrine of beneficial use", to which water users continue to be subject to even after entry of a partial decree:

> If this Court were to rule the Director lacks the power in a delivery call to evaluate whether the senior is putting the water to beneficial use, we would be ignoring the constitutional requirement that priority over water be extended only to those using the water. . . . water rights adjudications neither address, nor answer, the questions presented in delivery calls . . . . **reasonableness is not an element of a water right; thus, evaluation of whether a diversion is reasonable in the administration context should not be deemed a re-adjudication**.

AFRD #2, 143 Idaho at 876-77, 154 P.3d at 447-48 (emphasis added) (citation omitted). As noted by the Supreme Court in its recent *Clear Springs* decision,

> [t]here is no difference between securing the maximum use and benefit, and least wasteful use, of this State's water resources and the optimum development of water resources in the public interest. . . . [t]he policy of securing the maximum use and benefit, and least wasteful use, of the State's

water resources applies to both surface and underground waters, and it requires that they be managed conjunctively.

Clear Springs Foods, Inc. v. Spackman, 150 Idaho 790, 808, 252 P.3d 71, 89 (2011).

145. As such, the Director is to examine a senior's beneficial use and need in administration:

> Neither the Idaho Constitution, nor statutes, permit irrigation districts and individual water right holders to waste water or unnecessarily hoard it without putting it to some beneficial use. At oral argument, one of the irrigation district attorneys candidly admitted that their position was that they should be permitted to fill their entire storage water right, <u>regardless of whether there was any indication that it was necessary to fulfill current or future needs</u> and even though the irrigation districts routinely sell or lease the water for uses unrelated to the original rights. <u>This is simply not the law of Idaho</u>.

AFRD#2, 143 Idaho at 880, 154 P.3d at 451 (emphasis added).

146. Pursuant to the same rule, a senior appropriator cannot place a delivery call for water that he cannot put to a beneficial use. "A person who is not applying the water to a beneficial purpose cannot waste it or exclude others from using it." *Joyce Livestock Co. v. United States*, 144 Idaho 1, 19, 156 P.3d 502, 520 (2007). *See also, Martiny v. Wells*, 91 Idaho 215, 218, 419 P.2d 470, 473 (1966) ("Wasting of irrigation water is disapproved by the constitution and laws of this state") (*citing* Article XV of the Idaho Constitution). "[I]t is the duty of a prior appropriator of water to allow the use of such water by a junior appropriator at times when the prior appropriator has no immediate need for the use thereof." *Id.*

A. Application of CMR

147. The Rules for Conjunctive Management of Surface and Ground Water Resources ("CM Rules"), promulgated pursuant to Idaho Code §42-603, govern delivery calls. IDAPA § 37.03.11. "The CM Rules provide a list of the factors that the Director may consider in his determination of a senior right holder's material injury." *A&B,* 153 Idaho at 515, 284 P.3d at 240.

148. The CM Rules "give the Director the tools by which to determine 'how the various ground and surface water sources are interconnected, and how, when, where and to what extent the diversion and use of water from one source impacts [others].' " *AFRD#2*, 143 Idaho at 878, 154 P.3d at 449 (quoting A & B*); See also A & B,* 153 Idaho at 516, 284 P.3d at 241 (Director's finding that senior had an obligation to take reasonable steps to maximize interconnection of its system before seeking curtailment affirmed as a proper exercise of discretion and application of the CM Rules).

B. Director's Discretion

149. The Director and IDWR are charged with administering the waters of the State of Idaho during a delivery call. *AFRD#2,* 143 Idaho at 877, 154 P.3d at 448. In *AFRD#2* the Idaho Supreme Court identified the elements of the Director's discretion in a delivery call, including the necessary authority to evaluate whether the senior is putting water to beneficial use and the reasonableness of any uses being made. *Id.* at 880, 154 P.3d at 451. There, the Court found that the CM Rules "do give the Director the tools by which to determine how the various ground and surface water sources are interconnected, and how, when, where and to what extent the diversion and use of water from one source impacts [others]."). *Id.* at 878, 154 P.3d at 449 (internal citation and quotation omitted). The Court rejected the concept that a senior is entitled to shut-and-fasten administration to deliver the amount on the face of the senior's decree, and instead found that it is within the Director's discretion to consider a variety of factors outlined in the CMR and Idaho law to evaluate claims of injury. *Id.* at 878, 154 P.3d at 449.

II. INTERPRETATION OF RANGEN'S DECREES

150. Idaho law requires that the Director give effect to each element of a partial decree. *City of Pocatello v. Idaho*, 152 Idaho 830, 839, 275 P.3d 845, 854 (2012).

151. Prior to trial, the Director determined that Rangen's source of water subject to its partial decrees was limited to the Martin-Curren Tunnel.

152. The Director concludes as a matter of fact and law, that the Martin-Curren Tunnel supply is being delivered to Rangen via the White Pipe and the Steel Pipe.

153. Even if Rangen had established that a portion of the lawful supply from the Martin-Curren Tunnel is not diverted by means of the White Pipe and the Steel Pipe so that it can be diverted at the Lower Diversion, Rangen's diversions made at the Lower Diversion are not made within the scope of Rangen's partial decrees because the Lower Diversion is outside of the 10 acre tract.

154. The Director also concludes as a matter of fact and law that Rangen's demand for curtailment to satisfy water right no. 36-7694 is denied. The evidence in the record established beyond a reasonable doubt that Rangen has never relied on the amounts of water called for under 36-7694. In the absence of a history of beneficial use and reliance on a water right, the senior is foreclosed from demanding curtailment to satisfy the water right. Memorandum Decision and Order on Petition for Judicial Review at 30-33, *A&B Irrigation District v. Idaho Department of Water Resources*, Case No. 2009-000647 (May 4, 2010).

III. REASONABLENESS OF RANGEN'S OPERATIONS

155. *AFRD#2* establishes that the reasonableness of a senior's use of its water rights is not reflected in the partial decree. *AFRD#2,* 143 Idaho at 877, 154 P.3d at 448 (2007). An evaluation of whether Rangen's operations are reasonable is left to the sound discretion of the IDWR. The Department may decline all or any part of a delivery call based on its findings on reasonableness. Because this finding is not one made by the adjudication court, such a finding does not amount to a "permanent or temporary" modification of the

terms of the partial decree, but instead evaluates the senior's operations in light of all the evidence. *A & B Irr. Dist. v. Idaho Dept. Of Water Resources*, 153 Idaho 500, 524, 284 P.3d 225, 249 (2012).

156. Unreasonable operations can include issues related to the efficiency of the means of diversion, ability of the senior water user to provide evidence regarding amounts of water diverted and used over time, and evaluation of senior water user's operations in light of applicable decree terms.

157. The Director is without authority to order curtailment if the senior is not operating efficiently and reasonably. *A & B*, 153 Idaho 500 at 515-16, 284 P.3d 225 at 240-41.

158. Based on the body of evidence introduced at trial, the Director concludes that Rangen's operations are not reasonable.

    a. Prior to hearing, Rangen was unaware that its Martin-Curren Tunnel supply was the only physical supply subject to its partial decrees.

    b. Rangen's operations developed in reliance on a windfall of physical supply diverted at its Lower Diversion. To the extent that Rangen seeks curtailment to return its water supply to amounts it previously diverted from both the Martin-Curren Tunnel and the Lower Diversion, Rangen's claims simply cannot be satisfied under any legal theory.

    c. The Director concludes that Rangen's longstanding measurement problems demonstrate unreasonableness in operations for purposes of evaluating this delivery call. Rangen is free to engage in under-measurement of its water but such data cannot form the basis of a request to curtail the entire aquifer.

    d. This determination that Rangen's operations are unreasonable because of measurement problems does not directly impact the results in this matter because the Director has already concluded that Rangen's partial decrees protect only the Martin-Curren Tunnel supplies.

    e. However, because Rangen has requested administration from the Department, the Director orders that the Martin-Curren Tunnel measuring devices be repaired and reinstalled upstream of Rangen's White Pipe so that the Department can obtain and maintain accurate measurements of the water supply associated with Rangen's partial decrees.

159. Based on the body of evidence introduced at trial, the Director concludes that Rangen's means of diversion are not reasonable.

    a. The Department's role in a delivery call is to interpret partial decrees, not re-adjudicate them. The evidence demonstrated that only the 6 inch White Pipe and 12 inch Steel Pipe capture and convey water from the Martin-Curren Tunnel to the Rangen Hatchery. No evidence was presented to suggest that the amounts diverted by Rangen at the Lower Diversion arise from the Martin-Curren Tunnel.

In the absence of such evidence, the Director is forced to conclude that the Martin-Curren Tunnel water supply conveyed to Rangen by the White Pipe and Steel Pipe are the only waters subject to Rangen's partial decrees.

b. To the extent that the evidence showed that water sometimes spills from the Rangen Box and is then available for re-diversion at the Lower Diversion, the Director concludes that such operations are not "diversions" made within the 10 acre tract and thus Rangen is wasting water.

c. To the extent that Rangen relies on such operations, its operations are not reasonable and its diversion facilities are not reasonable.

IV. RANGEN'S WATER SUPPLY IS ADEQUATE TO CONDUCT RESEARCH

160. Based on the above Findings of Fact, the Director concludes as a matter of law that if Rangen is limited to its Martin-Curren Tunnel supply as required by it partial decrees, it can continue to conduct research as it has in the past. Even during trial, during what has historically been a low flow period for the Curren Spring complex, Rangen was conducting research in hatch-house.

161. Rangen has no demonstrated reliance on research in the Large Raceways.

162. Testimony established that even if Rangen had previously relied on the Large Raceways, Rangen required 30 cfs to conduct research in the Large Raceways. As discussed in Conclusion of Law ¶VI below, even curtailing all ground water rights junior to 1962 would not supply Rangen with 30 cfs.

163. Rangen has no demonstrated reliance on research in the Small Raceways at volumes of water larger than those currently being experienced.

164. Further, Mr. Ramsey's testimony that research Rangen might do in the Large Raceways could be conducted in the Greenhouse is compelling.

165. Finally, as noted above, the Martin-Curren Tunnel supply is currently delivered to only the hatch-house, greenhouse and small raceways so there is no problem related to physical supply or arrangement of the diversion works.

V. RANGEN'S WATER SUPPLY IS NOT ADEQUATE TO SATISFY ITS IDAHO POWER CONTRACT OR ITS SALE OF EXCESS FISH ON THE COMMERCIAL SPOT MARKET BUT IT IS NOT INJURED

166. Rangen's water supply available from the Martin-Curren Tunnel is not adequate to allow it to satisfy its Idaho Power Contract.

167. Testimony established that Rangen first entered into a contract with Idaho Power in 2004.

168. Exhibit 3650, Figure 2-5a demonstrates that the lawful supply available to Rangen from the Martin-Curren Tunnel has not significantly varied from that available to it today since

2001. In that span of time, the amounts available from the Martin-Curren Tunnel have varied from approximately 2-11 cfs.

169. However, if Rangen had limited its operations to the Martin-Curren Tunnel supply which is protected by its partial decrees, it would not have entered into the Idaho Power Contract in the first place.

170. Thus, Rangen cannot claim injury to its beneficial uses related to production of conservation fish, because the production of these fish relied on water supplies that were not subject to the partial decrees and so, properly speaking, are not "beneficial uses" under Rangen's partial decrees.

171. The same reasoning applies to Rangen's sale of excess conservation fish on the commercial spot market. The production of fish for sale on the commercial spot market in reliance on water supplies that are not subject to the partial decrees is not strictly "beneficial use" that is subject to protection or remedy in a delivery call.

172. Further, as demonstrated by Exhibit 3286, during the time period when Rangen was allegedly engaged in commercial fish production (prior to 2002-2003 when it declined it continue its leases of the Woods and Decker Springs Pond satellite production facilities, *see* Findings of Fact ¶VI.B.) Rangen's water supply was in excess of 20 cfs. As discussed further below, even curtailing all ground water rights junior to 1962 would not supply Rangen with 20 cfs.

VI. FUTILITY AND INEFFICIENCY OF CURTAILMENT

173. Even if the Director were to conclude that Range was suffering material injury to its beneficial uses, curtailment would not be called for.

174. As established by the testimony and analyses of the IDWR Staff and Mr. Sullivan, the amounts of water accruing to Rangen from curtailment of junior ground water rights are small and accrue only over 20 years.

175. Further, the amounts available to Rangen from curtailing ground water rights junior to 1962 are not adequate to supply Range with "material amounts" of water. *See, supra*, Conclusions of Law, ¶¶IV.161, V.171).

176. Further, the relative contributions from remotely located junior ground water rights are extremely small by comparison to the amounts that would accrue at Rangen.

    a. For example, curtailment of all of Pocatello's junior ground water rights would result in only 5-8 gpm of water accruing to Rangen. This is less than the average garden hose.

    b. Similarly, curtailment of all of FMID's junior ground water rights would result in only 24 gallons *altogether* accruing at Rangen, and less than 1 af accruing after 150 years of curtailment.

c. These relative contributions from these large ground water entities remotely located from Rangen make curtailment of these junior rights inefficient and unworkable under Idaho law.

d. Under CMR 20.04, the Director is authorized to decline to curtail junior ground water pumping if the "hydrologic connection [is] remote, the resource is large, and no direct immediate relief would be achieved if the junior priority water use was discontinued".

e. IDWR is authorized to order curtailment when it is necessary "in order to supply the prior rights of others." I.C. 42-607. The Idaho Supreme Court has determined that a call is futile if curtailment will not produce a water supply "in sufficient quantity for [the senior] to apply it to beneficial use." *Gilbert v. Smith*, 97 Idaho 735, 739, 552 P.2d 1220, 1224 (1976).

f. It is undisputed that Rangen will not benefit from an increase in its physical supply by 5-8 gpm or by 24 gallons altogether.

g. Therefore, the Director finds that, even if Rangen were injured, it would be inappropriate to curtail water users that would contribute less than 2% to Rangen's lawful supply at the Martin-Curren Tunnel. Exhibit 3650, Figure 8-4 identifies the geographic extent of finding.

177. The Director further concludes that curtailment will provide too little water to Rangen by comparison to the amounts of water to be supplied to other non-calling water rights. This is demonstrated by Exhibit 3650, Figure 2-1 and Table 2-1, which summarizes the locations where water will accrue other than Rangen.

178. The Director is not authorized to order curtailment, *inter alia*, to benefit non-calling water rights. Rangen's testimony that this will generally benefit the aquifer and senior water rights is not persuasive, and does not overcome the limitations on the Director's curtailment authority.

179. The Director is not authorized to order curtailment to provide amounts of water that are not material to Rangen.

180. In any event, because Rangen is not injured, curtailment is not appropriate.

181. None of this forecloses Rangen's efforts to further develop additional water supplies on its own. Testimony established that reliance on ground water would be a viable option for Rangen.

Dated this ___ day _________ of 2013.

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Gary Spackman, Director.