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Albert P. Barker
apb@idahowaters.com

September 25, 2007

RECEIVED Dave

SEP 26 2007

DEPARTMENT OF
WATER RESOURCES

David Tuthill *DT*
Director, Idaho Department of Water Resources
322 E. Front Street
P.O. Box 83720
Boise, Idaho 83720-0098

COPY

Re: Lucky Peak Power Plant Project, Water Rights No. 63-9019 and 63-11069

Dear Director Tuthill:

Boise Project Board of Control has two water permits for the Lucky Peak Power Plant Project located on the Boise River just upstream from the City of Boise. Those water rights are 63-9019 and 63-11069. The permit for water right 63-9019 was approved on May 24, 1984. The second water right permit was approved on June 5, 1991. This second right added additional flows through the power plant. Lucky Peak Power Plant is a run of the river power plant utilizing the water that is released for irrigation and flood control and other purposes. The proof of beneficial use on right No. 63-9019 was made November 15, 1989. Proof of beneficial use on 63-11069 was made on July 22, 1991. On October 27, 1993, the Department of Water Resources conducted a field exam and confirmed that the water rights in these permits was actually put to beneficial use. For ten years, the Department of Water Resources did nothing to issue the license for this water right. According to the Department's on-line records, the water right permits were sent to the State Office in February or March of 2003, apparently in response to inquiries I had made of the Department about the status of the License. For the last four and one-half years, the State Office has taken no action to issue the license. I have inquired on numerous occasions with representatives of the Department of Water Resources when we might expect to see the license issued for the Lucky Peak Power Plant Project. I have never been told by any representative of the Department that there is any reason that the license should not be issued.

Fourteen years is too long for permittee to wait after the Department has conducted its field examination to have the license issued.

David Tuthill
September 25, 2007
Page 2

A quick review of the Department's records indicates that hundreds of licenses have been issued by the Department since 1993, many to water rights with priority dates substantially after the priority dates for the Lucky Peak Power Plant Project.

On behalf of the Boise Project Board of Control and its member irrigation districts, a formal request is hereby made upon the Department that it issue the Water Right Licenses for the Lucky Peak Power Plant Project under Water Rights 63-9019 and 63-11069 for the full amount of the water rights as confirmed by the field examination. If there is any reason why the Department cannot or will not issue the license at this time, please contact me so that the Board of Control, Districts, and the Lucky Peak Power Plant Project can consider their options.

Very truly yours,

BARKER ROSHOLT & SIMPSON LLP

A handwritten signature in black ink, appearing to read 'Albert P. Barker', with a long horizontal flourish extending to the right.

Albert P. Barker

APB/se

cc: Lucky Peak Power Plant Project Steering Committee

RECEIVED

MAR - 3 2001

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORTLucy Peak
Power Plant63-9019
63-11069

COPY

A. GENERAL INFORMATION

Permit No. 63-110691. Owner: Boise Project Board of Control Phone No. 344-7022Current Address: 9731 E. Hwy 21 Boise ID 83716 (New address)2. Accompanied by: Dennis Larrondo * EXAM DATE: 10/27/93Address: Same Phone No. SameRelationship to Permit Holder: Administrator / District Council3. Source: Boise River tributary to SNAKE River

B. OVERLAP REVIEW

1. Other water rights with the same place of use: } just these 2 permits for2. Other water rights with the same point of diversion: } NATURAL flow diversion &/or

C. DIVERSION AND DELIVERY SYSTEM

for power use. Numerous other
records & storage water.

1. Point(s) of Diversion:

Ident No.	Gov't Lot	1/4	1/4	1/4	Sec.	Twp.	Rge.	County	Method of Determination/Remarks
	7		SE	NE	11	2N	3E	Ada	7 1/2' top

2. Place(s) of Use:

Indicate Method of Determination SAME

TWP	RGE	SEC	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
2N	3E	11	X	X															—
			6.4	6.6															

* identified contact persons & both proofs of b.u.

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe I.D. as applicable.

See attachments
diagrams.

A, B & C for

Scale: $T =$ _____.

☒ Copy of USGS Quadrangle Attached Showing location(s) of point(s) of diversion and place(s) of use (required).

N/A Aerial Photo Attached
(required for Irrigation of 10+ acres)

✓ Photo of Diversion and System Attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
N/A	- gravity	flow system			

***Code to correspond with No. on map and aerial photo**

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
multiple Acoustic flowmeters			7430A			

2. Measurements: SEE memo

E. NARRATIVE/REMARKS/COMMENTS

See Memo

Have conditions of permit approval been met? ☒ yes ☐ no

F. FLOW CALCULATIONS

Measured Method:

☒ Additional Computation Sheets Attached

e items F + G + H ↗

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

 $V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$ _____ $V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$ _____ $V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$ _____

2. Volume Calculations for Other Uses:

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
63-9019: Power	1/1	12/31	5700	1,293,839.2 *
63-11609: Power	1/1	12/31	2451	556,350.8 *
Both Permits → Totals:			8151	1,850,190 *

2. Recommended Amendments

☐ Change P.D. as reflected above☐ Add P.D. as reflected above☐ None☒ Change P.U. as reflected above☒ Add P.U. as reflected above☐ Other

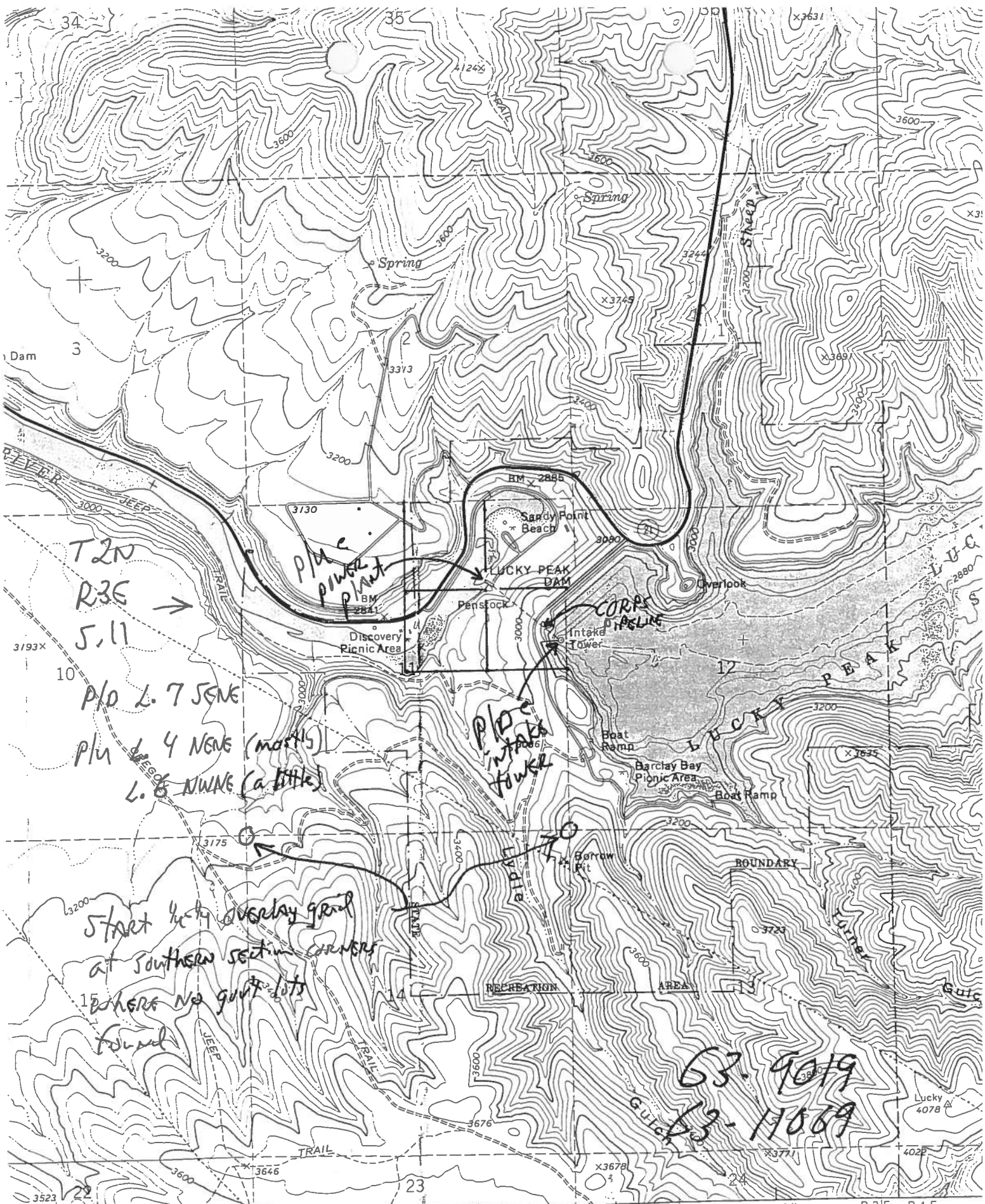
} amendment only
needed for
63-9019

I. AUTHENTICATIONField Examiner's Name Steve Lester Date 2/28/03

Reviewer _____ Date _____

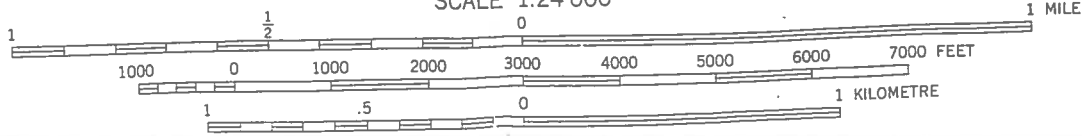
SEAL

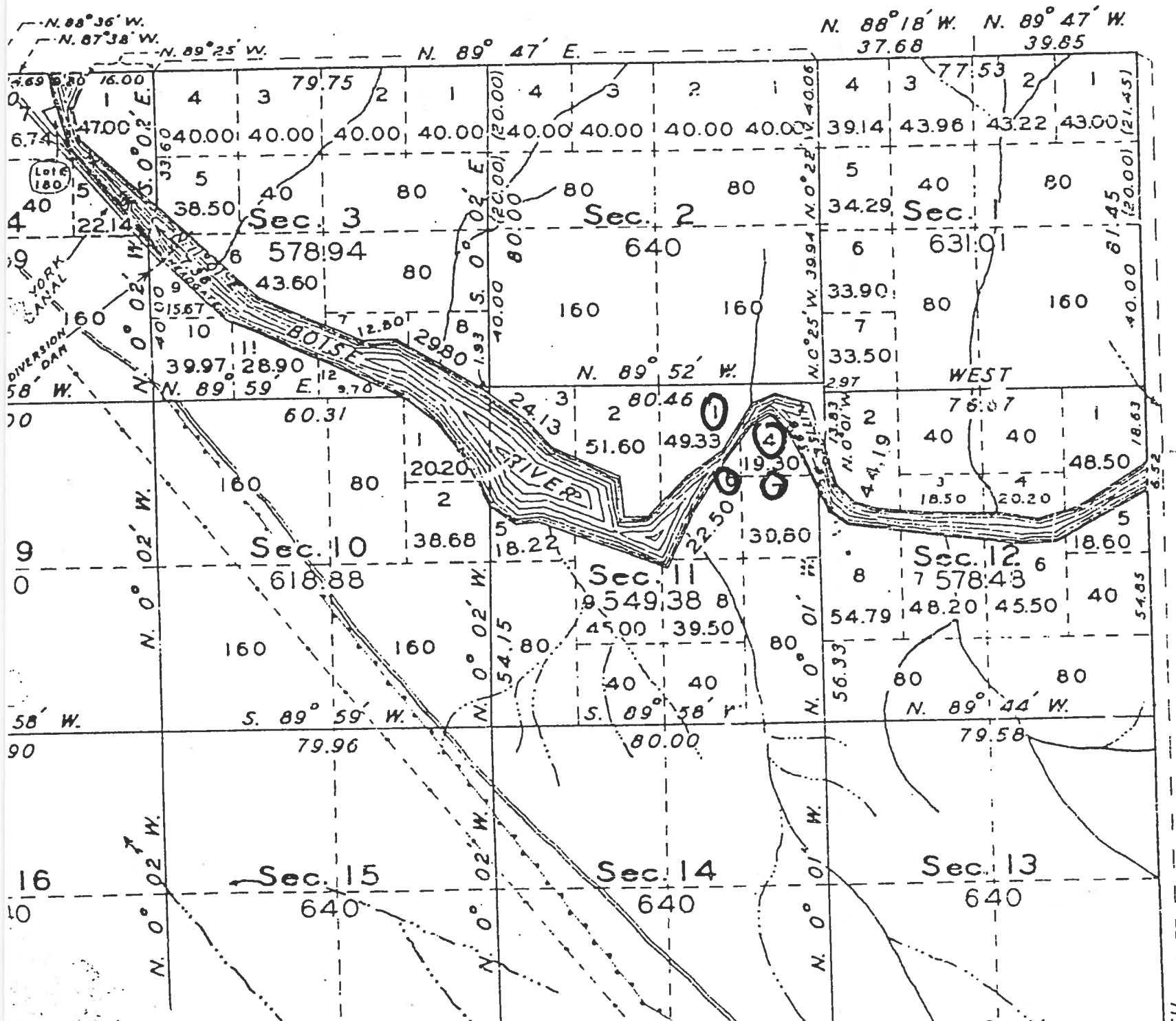
* with qualifying condition e ± factor re water supply.



(INDIAN CREEK RES.)
2770 1 NE

SCALE 1:24 000





63-09019

63-11069

Power plant C
Lucky Peak

T2N

R3E

5.11

63-9019, 63-11069 Additional Computations

10/27/93 Field Exam Report

I. RATE OF FLOW

	63-9019	63-11069
Permit	5700	2500
B.U.	5700	2451 (8151-5700)
Proof fee	5700	2500 (both e \$600 fee)
✓ Recommended cfs	5700	2451

II. VOLUME

$$V_D \quad 5700 \times 365 \times 1.9835 = 4,126,671.8 \quad | \quad 2451 \times 365 \times 1.9835 = 1,774,468.9$$

V_R assume prorated per cfs contribution for each permit when compared to total 8151 cfs for power plant:

$$\frac{5700}{8151} \times 1,850,190 = 1,293,839.2 \quad | \quad \frac{2451}{8151} \times 1,850,190 = 556,350.8$$

Both permits, $V_R < V_D$, Recommend V_R .

III. Summary

			<u>TOTAL</u>
cfs	5700	2451	8151
AFA	1,293,839.2*	556,350.8*	1,850,190*

* condition that volume may fluctuate based on water available for power use below or above 1.85 M AF.

-John Barth
2/28/03

MEMORANDUM

TO: File

FROM: Steve Lester 

DATE: February 27, 2003

RE: **Beneficial Use Exams for Permits 63-9019 & 63-11069**

Attachments in this discussion refer to those with the field exam report. The permit holder provided the attachments during the field exam.

The permits cover hydropower production at the **Lucky Peak power plant**. An intake tower just upstream from the dam houses a 22' or 23' diameter steel pipe leading to the power plant located just below the dam. This pipeline is known as the Corps pipeline, and essentially all natural flow and storage water exits the reservoir via this structure.¹ This mainline can carry about 28,500 cfs according to the project administrator. The mainline branches before entering the power plant. One branch leads to a spill gate for direct discharge to the river without power production.

The other branch runs to the power plant, splitting into three lines leading to three Kaplan turbine generators. Branches leading to the generators include two 14' diameter and one 7' diameter pipelines. Each pipeline hosts a computerized Accusonic flowmeter. All water released from the reservoir is tracked via the computerized system housed in the power plant. Water is used for power production upon being released from the reservoir for other uses (other water rights and/or flood control management). See Attachments A through C for system diagrams.

Rate of Flow

The power system was designed based on a maximum flow of 8151 cfs, a theoretical ceiling beyond which equipment will be damaged. This figure was the basis to file the second permit for an additional 2500 cfs (63-11069). See Attachment D for more information about this data. The sum of the permits is 8200 cfs, slightly above the theoretical limit. The power plant is rated with a maximum output of 101,250 KW and an approximated maximum discharge of 7600 cfs through the turbines (Attachment A). A minimum of about 1700 cfs is needed to run the three generators.

¹ Another pipeline can divert water from the reservoir and discharge directly to the river without involving the power plant. This line is the auxiliary outlet tunnel shown in Attachment A. This outlet also includes an Accusonic flowmeter included in the computerized monitoring system housed in the power plant.

Power production began by early May 1988 according to the proof of beneficial use in 63-9019. A "first use" date for 63-11069 is not listed on that permit's proof filing, but it is reasonable to assume beneficial use under the latter permit started, for water right purposes, by the priority date for 63-11069. Attachment D supports this conclusion. The maximum flow measured through the power plant (by the time of the field exam) occurred on April 25, 1989. That day showed 6618 cfs diverted through the plant (Attachment E). Flows through the power plant were not recorded during the field exam because it became obvious that any single reading in those circumstances would not limit the licenses.

Licensing should not be limited to the maximum flow recorded between the dates of proof filings and the field exam. Due to the nature of the Boise River system, licensed rates of flow should be between 7600 and 8151 or 8200 cfs to reflect the capacity of the system. The middle value of **8151 cfs is probably the most defensible value for licensed rates of flow.** The power plant could beneficially use that rate of flow if it were available. Rates as high as 8151 cfs are not unreasonable since natural flow and/or storage are diverted through the Corps pipeline.

Annual Volume for Power Production

Attachment F summarizes annual volume for the Boise River from 1926 through 1993 (a valuable historical document). Annual volume averaged about 2M af (1,947,568). Previous Boise River transfers documented 1980 as a representative year with respect to annual volume. That year was slightly above average according to those transfer files (63-165, 63-169 and 63-243). Those transfer files confirm the average annual volume listed in Attachment F. The attachment shows 1980 volume exceeded the average by 5.7%.

Approximately 95% of water released from Lucky Peak Reservoir is routed through the power plant according to the project administrator. The remaining water bypasses the plant and is discharged directly to the river as already noted.

How can "volume required" be determined for part G of the field exam report? What is the volume needed for the beneficial use? I suppose one could use one of several theoretical calculations to approximate the necessary volume. I think a better method would account for expected runoff in the river system as follows from Attachment F.

The beneficial use period from initial production of power to the date of the field exam covered 1988 through 1993. The amount of water flowing through the system for those years multiplied by the "95% power use" factor yields an average use of about 1,232,602 afa for power production. However, 95% of average annual runoff for 1926-1993 is about 1,850,190 af per Attachment F. This latter figure provides a better value for a "typical" quantity of water available for power production. The permit holder should not be

penalized for less than average flows during the “beneficial use years” and should not be limited to an average volume expected from the river system.

The preceding paragraph discusses annual volume per Attachment F in an average year. But most of the power is produced during April through October when deliveries occur for other purposes first. Available volume during the irrigation season months of April through October (watermaster deliveries usually run from early-mid April through mid-late October but treat as whole months here) averages about 1,522,993 af. This value multiplied by the 95% factor yields approximately 1,446,843 af “typically” available for power use.

The estimated 1.5 million af available for power in an average irrigation season is probably a more realistic measure of the permits than the 1.85 million af projection for year around use. But it is possible for a considerable amount of water to be released during the non-irrigation season (imagine a 1000 or more year flood event with heavy releases well before April, for example), boosting total use well beyond 1.85M af.

Using the same argument advanced in the rate of flow discussion, licensed volume should be based on the capacity of the system to beneficially use water. Volume should not be limited to measured amounts from 1988 through 1993 nor should it be limited to water available only during the irrigation season. The benefit of the doubt favors a permit holder.

The power plant could beneficially use an **average annual volume of about 1.85 million af** if flows were available. The system could use more than that should water become available. A reasonable solution to the volume issue is to license the average annual volume with a condition allowing the volume to be adjusted based on the water supply. More often than not, the estimated 1.85 million af will not be achieved in terms of power production, making the annual cap fairly theoretical.

Conditions of Approval

Acceptable measuring devices are being used. Watermaster control is maintained for uses under the permits. Additional development beyond that in place when 63-11069 was filed has not occurred.

63-9019 listed a condition of approval about water quality not included with the other permit for some unknown reason. I called the project administrator today (same person as in 1993 exam). He told me the project was not required to obtain a permit from IDEQ. Operation of the plant does not increase water temperature to any significant extent. Nothing is added to the water as it travels through the plant and discharges to the river. The project does monitor dissolved oxygen and keeps records of that data. The plant operates under a contract with the US Army Corps of Engineers. Boise Project and Corps staffs meet regularly but without formal written reporting. The administrator assumes the Corps’ jurisdiction includes oversight of environmental aspects of the situation – a good

assumption given the Joint 404 permitting IDWR has had with the Corps. From all of this, I assume the condition about water quality is adequately addressed.

Conditions of approval in both permits have been satisfied.

One last item - today Mr. Larrando provided the new mailing address for the permit holder: 9731 E. Hwy 21, Boise 83716. Use this instead of the 1993 address in the exam notes.

The Lucky Peak Power Plant Project, completed in 1988, added even more than electric power generation. A Visitors' Center in the Power Plant now welcomes you year-round to exhibits and a view of the Plant's generators. Improvements were made to the area's boating, swimming, picknicking, hiking and biking facilities, and a 800-person capacity outdoor amphitheatre also was added.

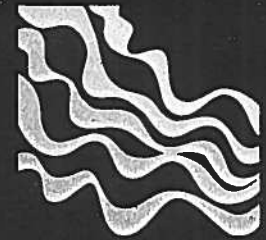
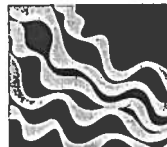
The area surrounding the Lucky Peak facilities continues to be a traditional winter habitat for golden and bald eagles, other raptors, and mule deer. Trout, bass and other fish attract sport fishing enthusiasts to Lucky Peak Lake. None of these habitats were disturbed or changed during construction of, or by the additions to the Lucky Peak Power Plant Project.

This multi-use area, 10 miles from Boise, is expected to attract more than one million visitors annually.

The Lucky Peak Dam, Power Plant, and recreational amenities represent a compatible blend of high-technology, flood control and irrigation uses, respect for the environment and public access. Enjoy your visit to the Lucky Peak Power Plant and beautiful natural surrounding. And, please play it safe and read the "Safety" portion of this brochure.

Cooperation

The Boise-Kuna, Nampa & Meridian, Wilder, and Big Bend Irrigation Districts own the Lucky Peak Power Plant Project. Seattle City Light, a municipal utility, purchases the power and operates the plant according to terms of a 50-year contract with the Irrigation Districts. Frequent meetings are held between the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, the Boise River Watermaster, the Irrigation Districts and the power plant operator to coordinate and maximize the benefits from the releases of water from Lucky Peak and two upstream dams, Arrowrock and Anderson Ranch. The Lucky Peak Power Plant owners and operator also cooperate with the Corps of Engineers, the Idaho Department of Parks and Recreation, and the Bureau of Reclamation to protect and maximize public access to the land, resources and recreational facilities in the vicinity of the Lucky Peak Project.



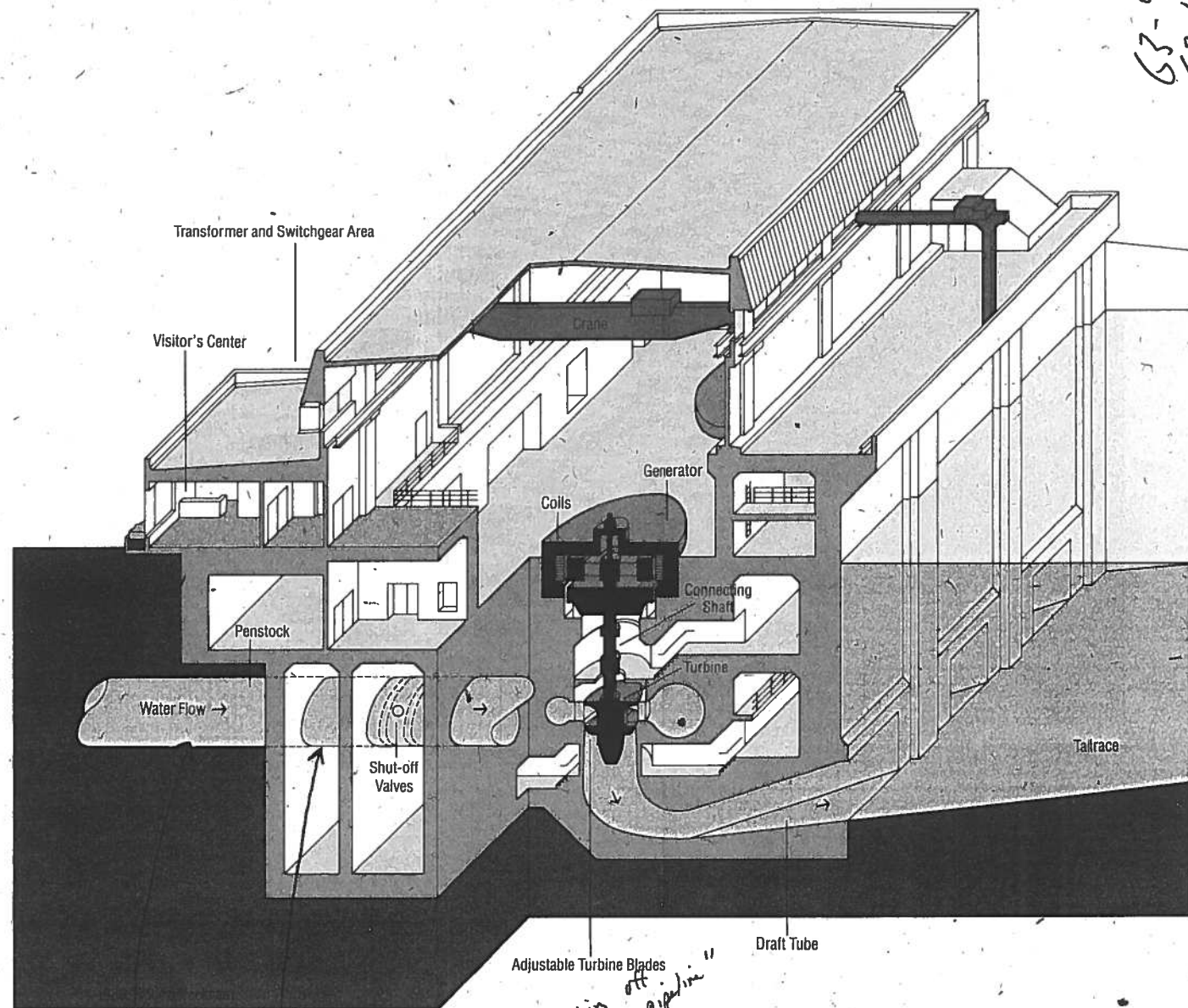
*Lucky
Peak
Power
Plant
Project*

First, there were the prehistoric hunters and Native American Indians. Fur trappers came in the early 1800's. Then, from the late 1830's into the 1850's, oxen-pulled wagon trains brought other settlers to the Boise River Basin. They were seeking new opportunities from the fertile fields, from livestock grazing, lumber, or gold and silver mining. These veterans of the Oregon Trail labored by hand and lighted their way by oil lamp. Electrification followed after the turn of the century.

During the first half of this century, new settlements sprung up throughout the Boise Basin. The demand for crops that would feed this ever-expanding population brought about the development of the area's irrigation systems. The Boise River provided the "fuel".

In the mid-1950's, the River that flowed by these former prehistoric campsites and pioneer outposts -- now full-fledged settlements -- was harnessed by the 340-foot high Lucky Peak Dam to control the ravages of springtime flooding and to more efficiently slake the land's thirst from summertime drought.

Now, a new dimension has been added to the Boise River legacy and the Lucky Peak Dam--a state-of-the-art hydroelectric powerhouse to generate electricity for homes, businesses, industry, schools, transportation systems, hospitals and recreation.



Legend



Corps of Engineers



Boat Ramp



Biking



Swimming



Amphithe



Hazardous Area



Boating



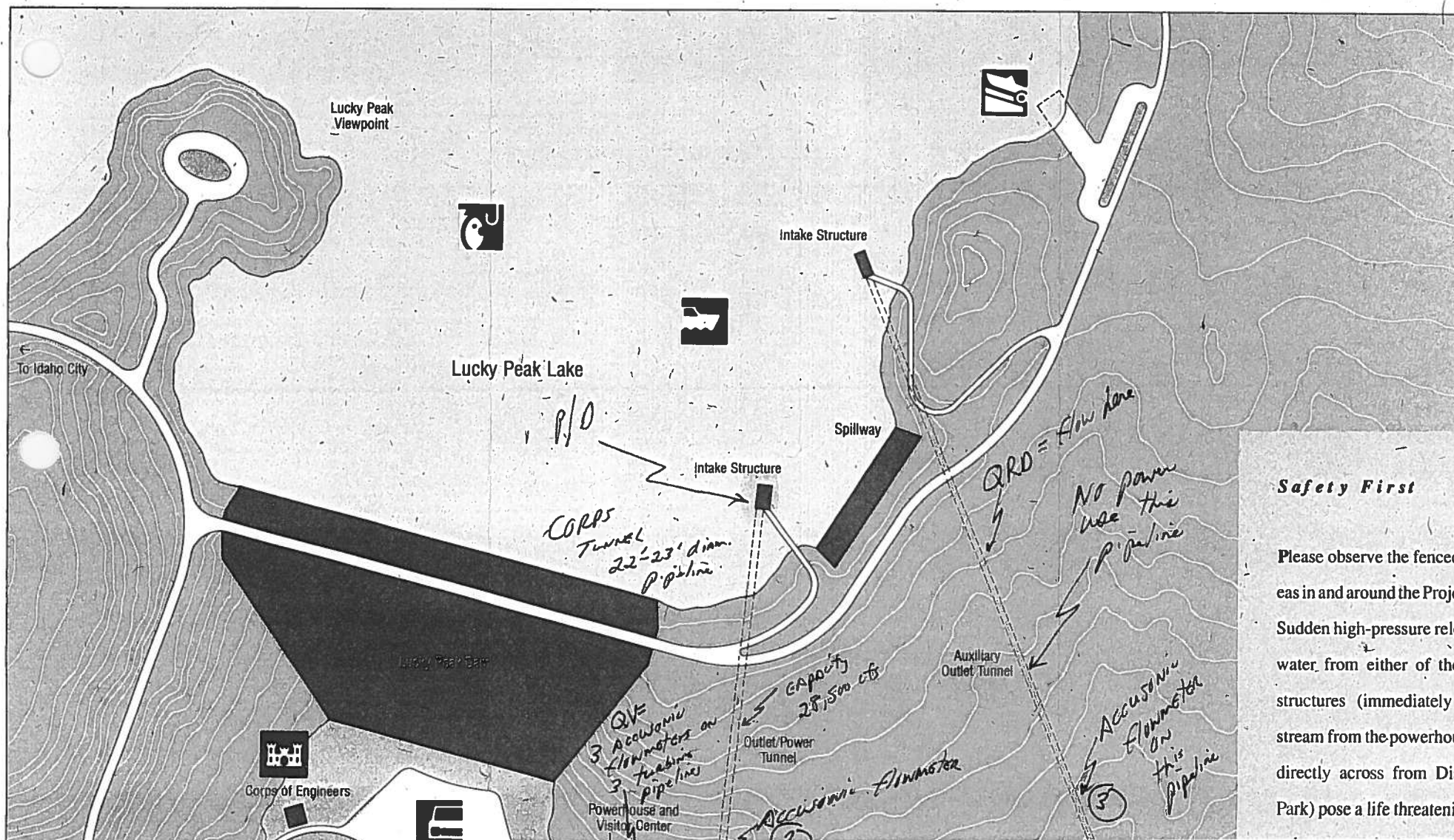
Parking



Picnic Area

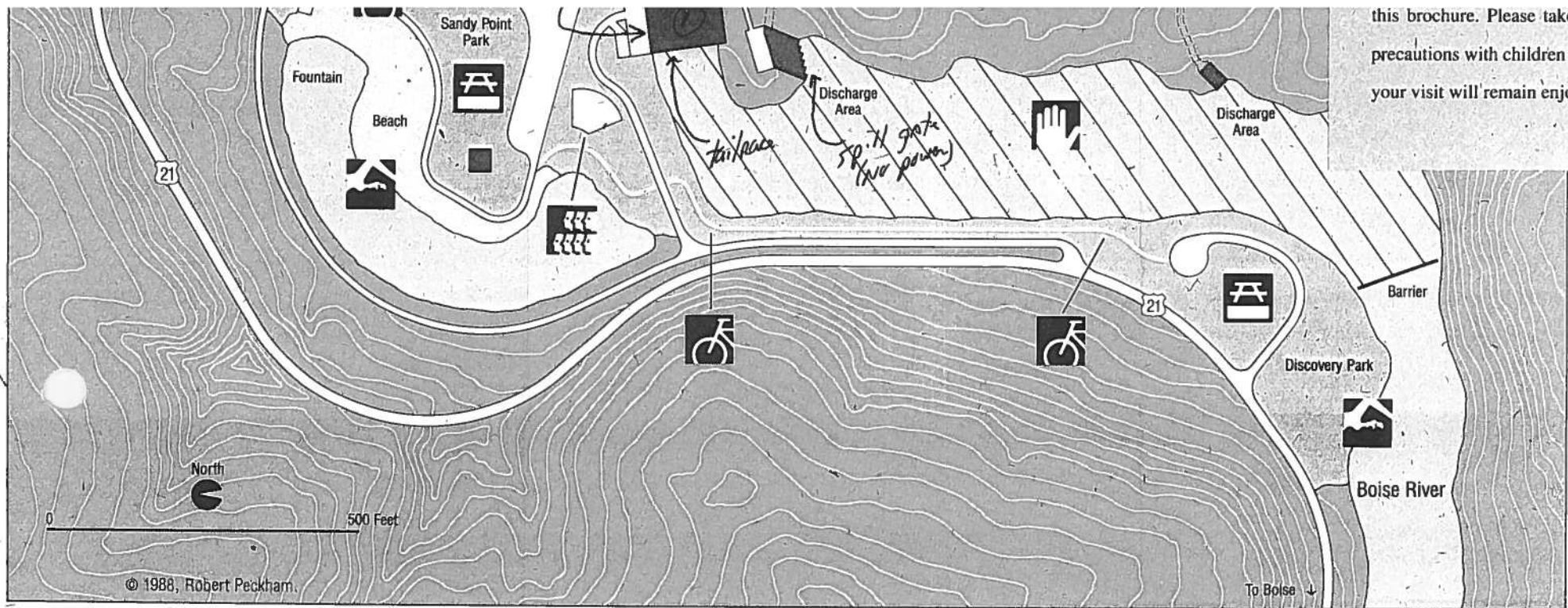


Fishing



Safety First

Please observe the fenced off areas in and around the Project area. Sudden high-pressure releases of water from either of the outlet structures (immediately downstream from the powerhouse, and directly across from Discovery Park) pose a life threatening hazard.



this brochure. Please take extra precautions with children so that your visit will remain enjoyable.

ALL RELEASES FROM RESERVOIR ARE MEASURED THROUGH FLOWMETERS @ SITES 1-3.

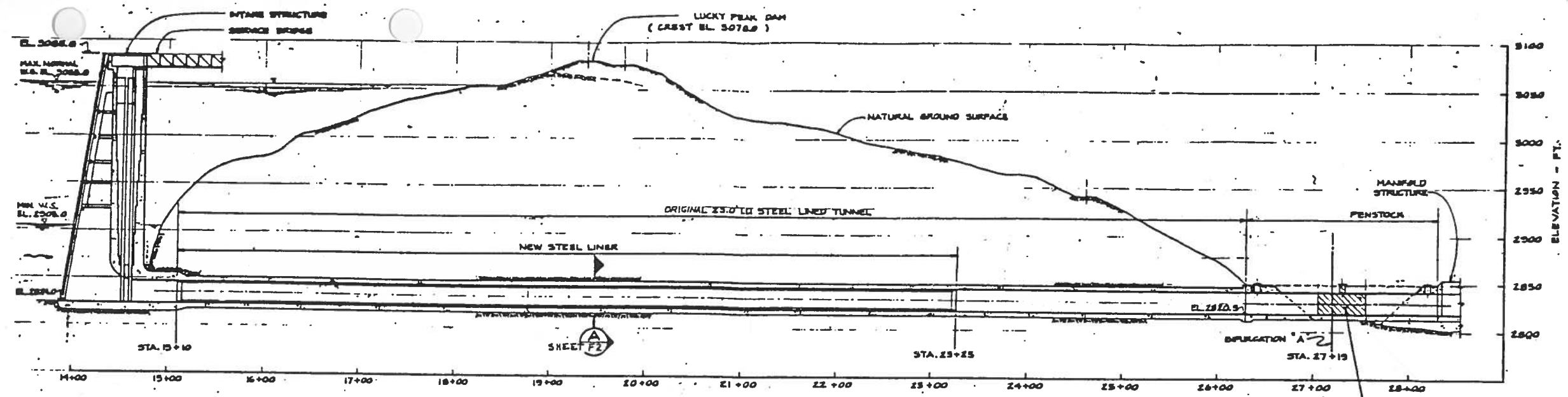
Power Production

The Lucky Peak Power Plant can produce up to 101 Megawatts of electricity. The Project utilizes irrigation, flood control, and other authorized releases to generate power. No water is released from the Lucky Peak reservoir solely for the purpose of producing electricity. The power is produced primarily from April-October when flood control and irrigation needs require releases of water. Minimal power production is possible during other months.

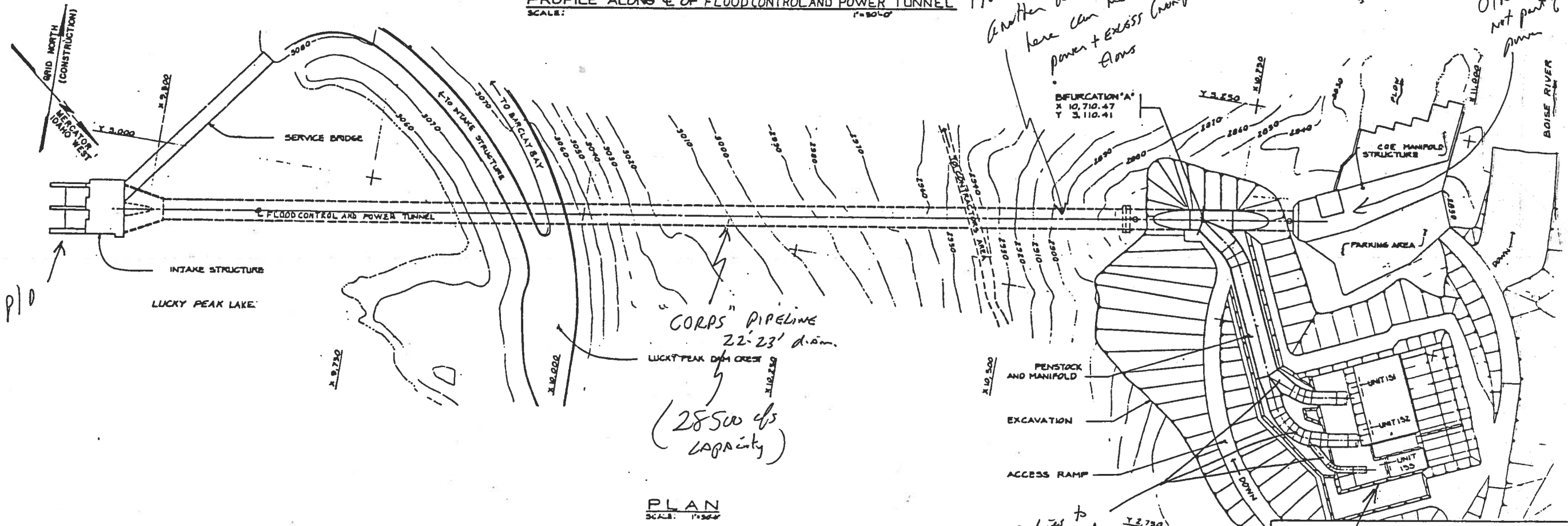
Electricity is produced at Lucky Peak when water released from the reservoir rushes downhill through the power tunnel to the Power Plant. The force of the falling water spins the turbines and generators to produce electricity. The amount of energy generated at any given time depends on the total amount of water that flows through the turbines, the height from which the water falls before reaching the turbines, and the type and design of the turbines. The Lucky Peak Power Plant contains three state-of-the-art Kaplan turbine/generators. They were specially designed for Lucky Peak to maximize power generation from available water.

Length of Powerhouse	171 feet
Width Of Powerhouse	123 feet
Height of Powerhouse	127 feet
Turbines/Generators	3 units
<u>Maximum Rated Output of Generators</u>	
Two at	45000 KW
One at	11250 KW
Generating Voltage	13.8 KV
Range of Operating Head-	80 to 242. feet
<u>Approximate Maximum Water Discharge through Turbines</u>	
	7600 cfs.
Estimated Average Annual Energy	327.6 GWh

} 101



PROFILE ALONG C OF FLOOD CONTROL AND POWER TUNNEL
SCALE: 1"=30'-0"



PLAN
SCALE: 1"=30'-0"

@ \$100 Million Dollar project
to bring on-line

\$100,000
Another accession
here can make
power + excess (unusable)
flows

slide gate =
other spill
not part of
power

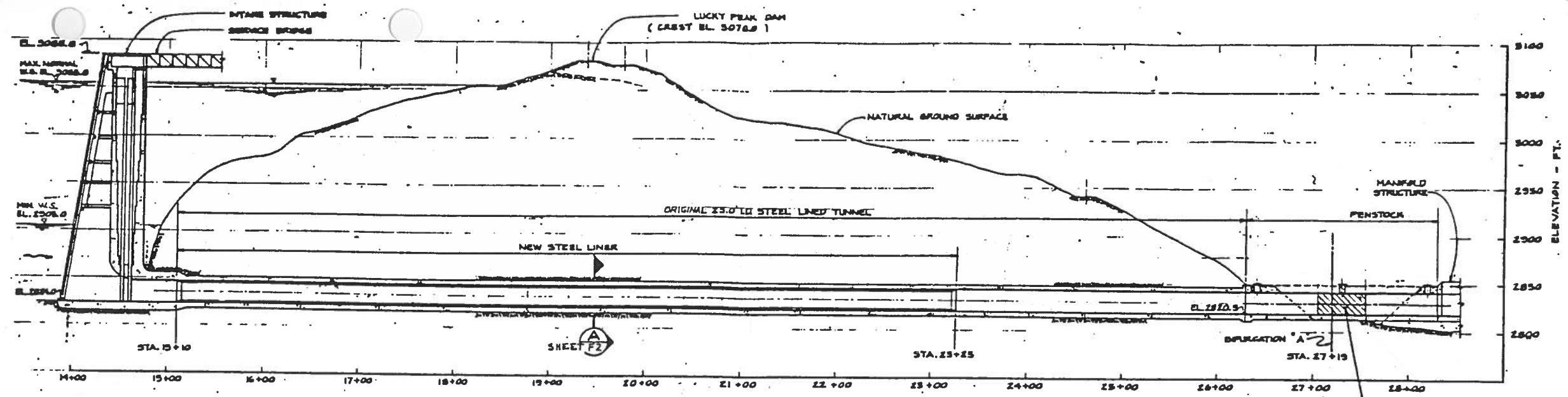
QV from
data sheet

3 lines to
3 generators
w/ 3 accessories

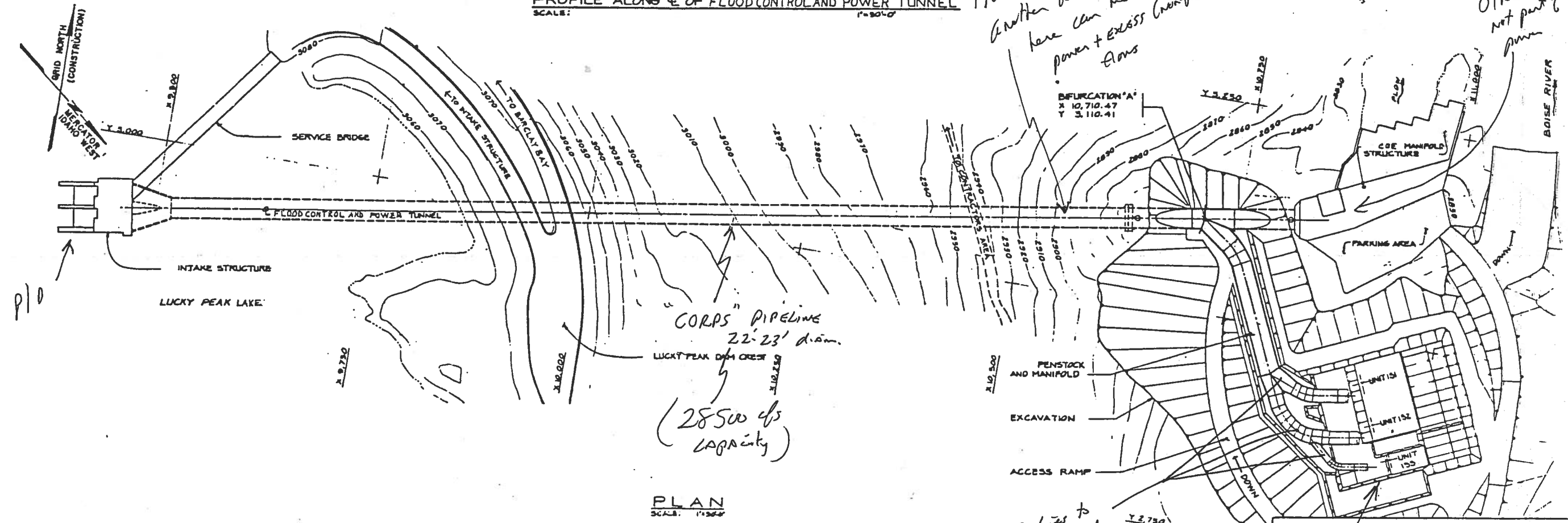
p/w = power plant w/
3 generators

LUCKY PEAK POWER PLANT PROJECT
BOISE-LENA IRRIGATION DISTRICT
HARPER AND MENCKEN IRRIGATION DISTRICT
WILDER IRRIGATION DISTRICT
THE BIG BEND IRRIGATION DISTRICT
NEW YORK IRRIGATION DISTRICT

EXHIBIT F-1
POWER TUNNEL
STEEL TUNNEL LINER (SHT. 1/21)

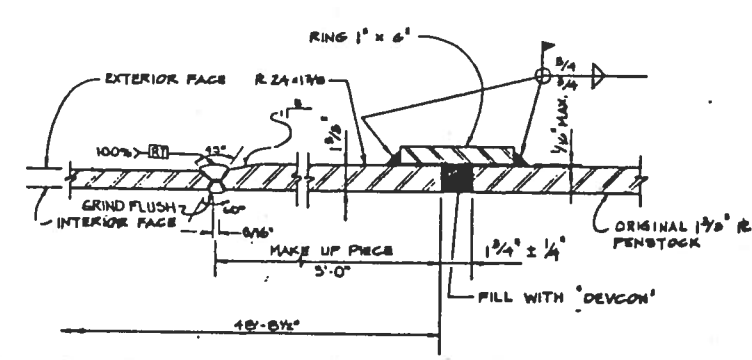
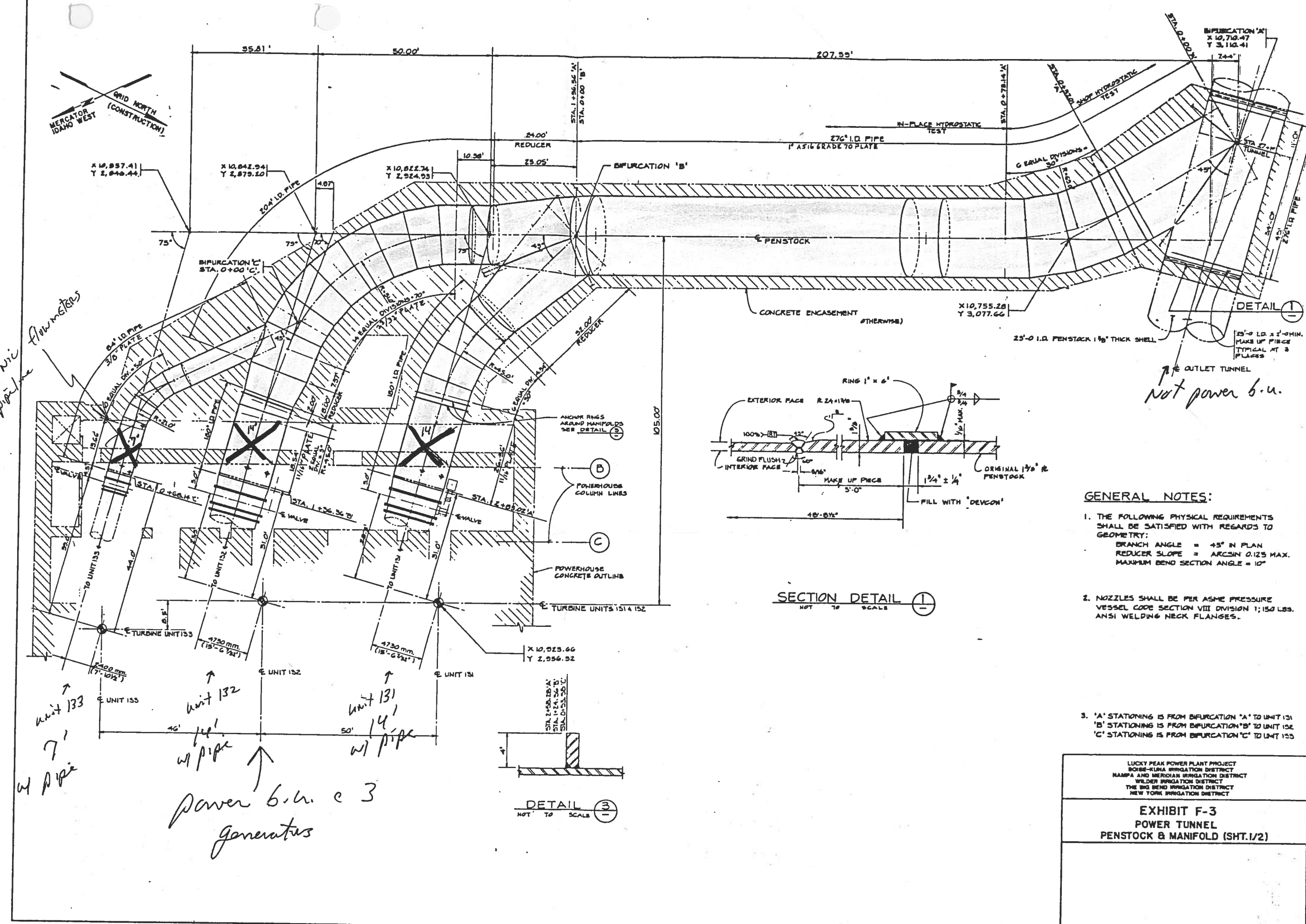


PROFILE ALONG C OF FLOOD CONTROL AND POWER TUNNEL
SCALE: 1"=30'-0"

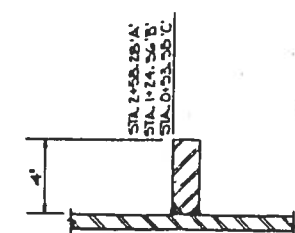


GRID NORTH
(CONSTRUCTION)
MERCATOR
IDAHO WEST

*x = Accusonic
3/pipeline*



SECTION DETAIL 1
NOT TO SCALE



DETAIL 3
NOT TO SCALE

- GENERAL NOTES:**
1. THE FOLLOWING PHYSICAL REQUIREMENTS SHALL BE SATISFIED WITH REGARDS TO GEOMETRY:
 BRANCH ANGLE = $\pm 45^\circ$ IN PLAN
 REDUCER SLOPE = $\arcsin 0.125$ MAX.
 MAXIMUM BEND SECTION ANGLE = 10°
 2. NOZZLES SHALL BE PER ASME PRESSURE VESSEL CODE SECTION VIII DIVISION 1; 150 LBS. ANSI WELDING NECK FLANGES.
 3. 'A' STATIONING IS FROM BIFURCATION 'A' TO UNIT 131
 'B' STATIONING IS FROM BIFURCATION 'B' TO UNIT 132
 'C' STATIONING IS FROM BIFURCATION 'C' TO UNIT 133

LUCKY PEAK POWER PLANT PROJECT BOISE-KUNA IRRIGATION DISTRICT HANNA AND MERIDIAN IRRIGATION DISTRICT WILDER IRRIGATION DISTRICT THE BIG BEND IRRIGATION DISTRICT NEW YORK IRRIGATION DISTRICT
EXHIBIT F-3 POWER TUNNEL PENSTOCK & MANIFOLD (SHT. 1/2)

not power b.u.

*power b.u. c 3
generators*

*unit 133
7' w/ pipe*
*unit 132
14' w/ pipe*
*unit 131
14' w/ pipe*



MORRISON-KNUDSEN ENGINEERS,
A MORRISON KNUDSEN COMPANY

INTER-OFFICE CORRESPONDENCE

SEP 28 1989

M-K ENGINEERS

TO: C. T. McCreedy
LOCATION: M-K, Boise
SUBJECT: Lucky Peak Project
Maximum Plant Discharge

FILE NUMBER: 4040-910
DATE: 27 September 1989
FROM: Jim Carson
LOCATION: San Francisco

Per your request of 27 September 1989, I have analyzed the maximum plant discharge. With all three units on line, the maximum discharge is a function of the generator output, which is dependent on power factor.

With generator limits of 50,000 kVA for units 131 and 132, 12,500 kVA for unit 133, and a power factor of 1.0, units 131 and 132 each have a maximum discharge of 3625 cfs at a net head of 181 ft. At this head, unit 133 has a discharge of 844 cfs, for a plant discharge of 8094 cfs. The controls allow a generator overload of 10% which, if not limited by the transformer, gives a total plant discharge of 8151 cfs at a net head of 198 ft.

These are summarized below:

	Unit 131	Unit 132	Unit 133	Total
Gen. kVA	50,000	50,000	12,500	112,500
Power Factor	1.0	1.0	1.0	
Gen. Efficiency	98.61	98.61	97.75	
Turbine kW	50,705	50,705	11,700	
Net Head	181	181	181	
Discharge cfs (Full gate)	3625	3625	844	8094
Gen. kVA	55,000	55,000	13,750	
Power Factor	1.0	1.0	1.0	
Gen. Efficiency	98.61	98.61	97.75	
Turbine kW	55,775	55,775	12,750	
Net Head	198	198	198	
	3651	3651	849	8151 ← cfs

J. L. Carson

JLC/tp

cc: Bill Connell

HEAD M.K. Engineer for
Mechanical Design PER
Dennis Larrondo 10/27/83

This memo was basis for amount of additional water filed
L. ID 63-11069.

63-9019 63-11069 ATTACHMENT D MB

DATE	23	24	25	26	27	28	29
Station : Code	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
ANDI : QD	605	606	606	603	607	603	603
AND : FB	4141.37	4143.15	4144.54	4145.65	4146.63	4147.56	4148.36
: AF	209,453	215,206	219,754	223,427	226,690	229,808	232,502
Change : AF	6,986	5,753	4,547	3,673	3,263	3,119	2,693
Change : CFS	+3,522	+2,900	+2,292	+1,852	+1,645	+1,572	+1,359
ARKI : QD	6000	7333	9390	9792	9583	9366	9,150
ARK : FB	3214.91	3213.34	3210.03	3205.98	3201.53	3197.20	3192.80
: AF	283,235	278,518	268,595	256,839	244,284	232,721	221,275
Change : AF	<1,539>	<4,717>	<9923>	<11,756>	<12,555>	<11,569>	<11,445>
Change : CFS	-776	-2378	-5003	-5927	-6,329	-5829	-5770
LUC : QV	6615	6615	6618 ^{cb}	6490	6,234	⑤ 6450 5,781	6,351
ORD	1675	1676	1949	2140	⑤ 289 2,296	2296	1692
QD	8290	8300	8567	8630	8,819	⑤ 8746 8,370	8,042
FB	3023.84	3024.60	3026.28	3028.01	3029.73	3030.93	3032.40
: AF	185,619	187,378	191,304	195,390	199,487	202,367	205,940
Change : AF	<318>	1759	+3926	4,086	4,097	2,877	3,576
Change : CFS	-160	+887	+1979	+2,060	+2,066	+1,450	+1,803
Failrace: Elev.	2817.72	2818.72	2818.73	2818.73	2818.54	2818.90	2818.76
LUC : QU	10,877	9,709	7,843	6,615	5,911	2332	5433
BDDI : HM	2817.68	2817.76	2817.78	2817.87	2817.96	2818.02	2817.92
: GD	10.76	10.76	10.83	10.85	10.83	10.79	10.35
: QD				6787	6752	6673	5808
BSEI : QD	7.17	7.21	7.45	7.71	7.90	8.03	8.19
: QD	1808	1,831	1,943	2,071	2166	2188	2210
EQD(BDDI&BSEI)				8858	8,918	8861	8018
Natural Flow CFS	10,877	9,710	7,836	6,615	6,200	5939	5433
LOW : FB		2525.70	2525.79	2525.82	2525.85	2525.88	2525.89
: AF		137,908	138,678	138,936			

Notes: Feeder Canal Capacity = ± 1000 cfs.
BSEI (New York Canal) Capacity = ± 2,700 cfs.
AND (Anderson Ranch) Capacity = 423,178 cfs.
ARK (Arrowrock) Capacity = 286,600 cfs.
LUC (Lucky Peak) Capacity - FB at 3055 = 264,371 AF
FB at 3060 = 278,276 AF
LOW (Lake Lowell) Capacity = 177,000 AF
1.9835 AF = 1 cfs. for one day

⑤ Flow Meter Error Actual About 6450
⑥ Slide gates operated does NOT accumulate in Hydromet system.

MAX. flow shown
4/25/89
QV (power pipeline)
QRD (Auxiliary pipeline, no pump)
QD = QV + QRD

Q Power Pipeline
63-9019 ATTACHMENT E
63-11069

NATURAL FLOW BOISE RIVER IN ACRE FEET

63-9019
63-11069

ATTACHMENT F

Keep copy of this

YEAR	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	TOTAL
1926	58,424	51,382	63,482	48,416	64,264	140,450	232,784	247,930	104,636	42,192	30,858	29,480	1,114,298
1927	34,882	67,640	84,702	62,700	107,342	185,560	374,434	660,044	729,736	234,042	74,454	57,570	2,673,106
1928	67,804	143,162	98,102	90,026	79,090	276,560	316,008	852,194	305,760	115,962	51,846	38,016	2,434,530
1929	49,856	50,404	46,770	46,690	49,214	106,834	179,238	359,536	285,968	96,482	35,716	31,802	1,338,510
1930	39,356	36,848	69,548	44,778	64,388	103,616	274,178	295,246	257,700	77,726	44,922	36,050	1,344,356
1931	54,512	45,418	44,108	44,814	45,298	91,246	177,172	251,538	110,844	34,042	23,952	23,940	946,884
1932	31,424	31,224	36,376	38,612	36,754	135,826	336,006	564,176	458,224	154,044	57,524	42,730	1,922,920
1933	39,142	56,478	40,596	43,926	41,136	64,474	239,342	341,610	538,198	106,458	43,964	32,200	1,587,524
1934	41,684	47,684	55,656	79,680	78,948	151,696	249,648	204,008	85,624	36,200	23,570	26,072	1,080,470
1935	37,226	49,444	51,208	52,256	54,336	83,150	299,458	428,528	363,262	98,220	38,058	29,980	1,585,126
1936	33,616	38,268	37,352	44,612	47,356	100,060	577,594	625,906	319,284	79,080	43,354	38,360	1,984,842
1937	39,772	36,600	41,556	37,568	41,728	89,870	207,358	381,192	178,996	59,986	25,948	25,746	1,166,320
1938	36,226	49,828	115,760	67,492	71,566	191,026	505,100	711,314	558,138	201,292	71,190	46,910	2,625,842
1939	60,626	67,394	60,980	52,236	47,170	164,294	328,918	341,836	136,300	60,358	28,454	30,436	1,379,002
1940	40,474	38,998	49,268	53,858	75,724	201,512	355,842	434,480	227,258	64,910	30,808	39,548	1,612,680
1941	53,168	59,764	56,634	54,260	65,368	113,448	188,300	365,336	226,776	85,452	54,496	41,720	1,364,722
1942	48,600	63,200	106,838	62,182	63,162	87,804	341,622	325,576	362,374	139,112	46,790	35,496	1,682,756
1943	42,564	64,068	81,782	153,190	116,564	235,138	1006532	722,804	627,754	359,598	100,484	53,192	3,563,670
1944	61,802	70,704	55,768	49,412	52,610	68,094	164,000	303,208	247,726	106,326	43,264	35,352	1,258,266
1945	40,828	52,200	42,902	56,270	80,124	99,160	202,368	473,146	405,996	139,040	51,630	39,020	1,682,684
1946	45,822	53,670	74,712	79,530	65,808	218,604	639,804	651,660	378,822	125,920	56,618	45,272	2,436,242
1947	67,394	72,214	109,392	60,364	87,278	181,276	289,400	545,764	297,240	110,646	46,168	38,466	1,905,602
1948	56,244	57,582	55,404	65,522	60,480	73,396	264,424	505,792	459,706	109,372	44,612	36,580	1,789,114
1949	44,642	53,918	51,094	49,038	45,314	146,834	416,548	571,670	304,424	93,542	41,120	31,176	1,849,320
1950	49,284	57,162	51,500	63,202	75,010	154,776	402,618	563,086	548,282	239,398	76,620	48,178	2,329,114
1951	61,640	84,448	88,986	69,948	125,878	125,072	556,968	684,894	440,580	195,068	70,970	42,550	2,547,002
1952	79,304	63,432	86,830	68,642	77,070	103,020	677,890	901,634	518,282	171,498	68,760	49,854	2,866,216
1953	52,108	48,642	54,646	100,936	88,486	126,730	329,366	403,582	588,956	254,470	73,246	48,328	2,169,496
1954	44,870	59,728	57,732	64,266	92,288	149,836	381,720	597,550	339,666	179,018	66,360	41,668	2,074,702
1955	49,332	50,178	46,140	46,716	40,444	55,940	129,832	397,270	419,360	131,738	56,754	40,794	1,464,498
1956	51,704	68,686	205,818	147,212	104,470	228,258	636,502	841,354	582,588	188,844	62,734	55,716	3,173,886
1957	66,612	62,464	69,508	52,448	92,880	194,092	361,256	753,940	518,012	148,306	51,944	53,366	2,424,828
1958	54,116	52,148	58,128	53,682	121,836	124,694	323,778	946,374	501,566	142,466	61,766	54,424	2,494,978
1959	51,842	63,796	83,974	76,466	69,702	92,542	276,734	331,594	362,156	104,896	48,432	67,634	1,629,768
1960	86,908	60,852	48,514	51,664	64,890	172,830	358,988	374,362	333,350	81,574	45,758	46,244	1,725,934
1961	47,044	53,842	47,966	42,454	58,830	91,230	172,064	298,818	229,386	56,820	40,060	38,212	1,176,726
1962	52,150	51,660	51,872	54,554	78,326	83,072	407,856	406,458	425,398	142,912	57,452	49,586	1,861,296
1963	71,052	65,014	65,918	43,612	147,124	91,904	180,298	452,916	411,904	148,768	53,310	56,736	1,788,556
1964	53,040	66,998	51,172	52,170	53,860	71,218	262,166	457,280	407,856	152,946	50,092	52,798	1,731,596
1965	47,408	54,288	258,810	160,396	182,606	185,530	624,180	836,232	778,888	338,964	118,326	77,252	3,662,880
1966	65,450	61,218	52,690	63,168	47,170	97,960	248,302	327,154	178,048	54,000	39,052	37,766	1,271,978
1967	40,108	46,514	49,118	65,592	60,048	83,580	138,430	483,144	526,106	177,282	49,100	45,416	1,764,438
1968	58,400	55,142	49,414	47,040	98,090	119,292	152,728	259,286	278,606	76,126	72,200	55,250	1,321,574
1969	63,230	79,000	63,568	127,936	87,134	143,828	654,184	724,322	396,216	128,856	51,278	48,678	2,568,230
1970	56,088	47,734	52,950	127,050	101,728	149,020	189,668	577,010	571,508	205,552	61,036	54,950	2,194,302
1971	59,954	97,070	100,514	156,024	167,320	211,494	548,362	922,614	708,614	297,436	90,500	64,046	3,423,948
1972	68,434	61,904	65,210	101,004	101,026	446,586	394,274	752,262	745,556	208,518	70,876	61,488	3,077,138
1973	67,300	61,702	69,764	73,772	58,170	92,920	180,710	348,218	227,082	75,108	41,870	45,360	1,341,976
1974	47,726	97,112	90,004	130,992	90,940	259,786	599,914	736,774	787,716	238,736	78,966	54,292	3,212,958
1975	59,974	55,246	54,424	59,334	63,858	145,754	204,658	618,984	696,228	345,470	84,702	55,480	2,444,112
1976	69,938	65,950	87,954	71,086	75,852	108,240	383,236	637,050	336,204	126,112	68,604	67,948	2,098,174
1977	60,582	48,552	45,364	44,144	40,756	43,966	76,258	93,676	99,860	46,748	30,730	27,986	658,622
1978	40,284	45,306	105,045	80,908	89,730	221,530	381,218	470,968	470,402	230,260	63,758	67,430	2,266,839
1979	53,932	46,640	48,876	49,294	54,958	105,786	140,420	349,668	199,184	58,260	44,912	38,732	1,190,662
1980	44,574	39,648	45,274	73,156	90,782	124,636	363,104	572,048	407,242	180,914	58,564	59,422	2,059,364
1981	42,296	57,376	69,984	76,548	86,290	115,042	205,220	343,298	287,544	82,708	38,092	37,032	1,441,430
1982	45,890	69,934	100,366	70,410	186,474	244,858	422,888	883,648	682,230	330,936	93,770	65,304	3,196,708
1983	75,512	69,198	91,488	114,736	107,282	350,830	405,096	831,100	781,436	325,250	109,010	69,252	3,390,190
1984	76,832	104,694	98,544	82,612	94,818	228,722	438,570	706,104	617,694	262,018	87,430	72,692	2,870,730
1985	70,153	81,301	67,903	61,798	56,959	104,343	352,168	407,243	223,889	72,854	40,371	66,775	1,605,757
1986	74,777	68,744	61,268	73,811	273,945	476,942	524,135	557,077	539,061	131,083	61,801	71,431	2,914,075
1987	70,530	66,125	54,391	52,558	59,646	109,541	168,935	192,744	77,668	39,084	23,387	31,716	946,325
1988	39,206	37,519	47,965	44,721	50,290	93,690	210,124	251,548	169,654	47,839	35,440	29,213	1,057,209
1989	39,690	51,688	46,805	52,237	51,047	203,639	469,180	422,030	280,247	74,829	41,442	41,965	1,774,799
1990	49,402	46,873	43,681	48,442	43,675	97,222	121,315	234,309	263,653	73,572	42,385	34,810	1,099,339
1991	39,527	40,972	35,593	43,524	45,564	71,554	101,320	241,446	242,778	77,416	36,888	29,642	1,006,224
1992	39,567	53,676	46,470	40,636	56,653	94,149	134,402	173,541	69,615	37,471	25,789	26,495	798,464
1993	32,186	37,774	39,274	42,918	48,341	243,579	324,036	675,254	396,525	142,056	66,875		2,048,818
AVERAGE	52,883	59,059	68,256	68,548	79,460	149,252	335,017	503,005	391,729	140,503	54,724	45,806	1,947,568

424,575 non-in season months (1,522,993 in-in season months)

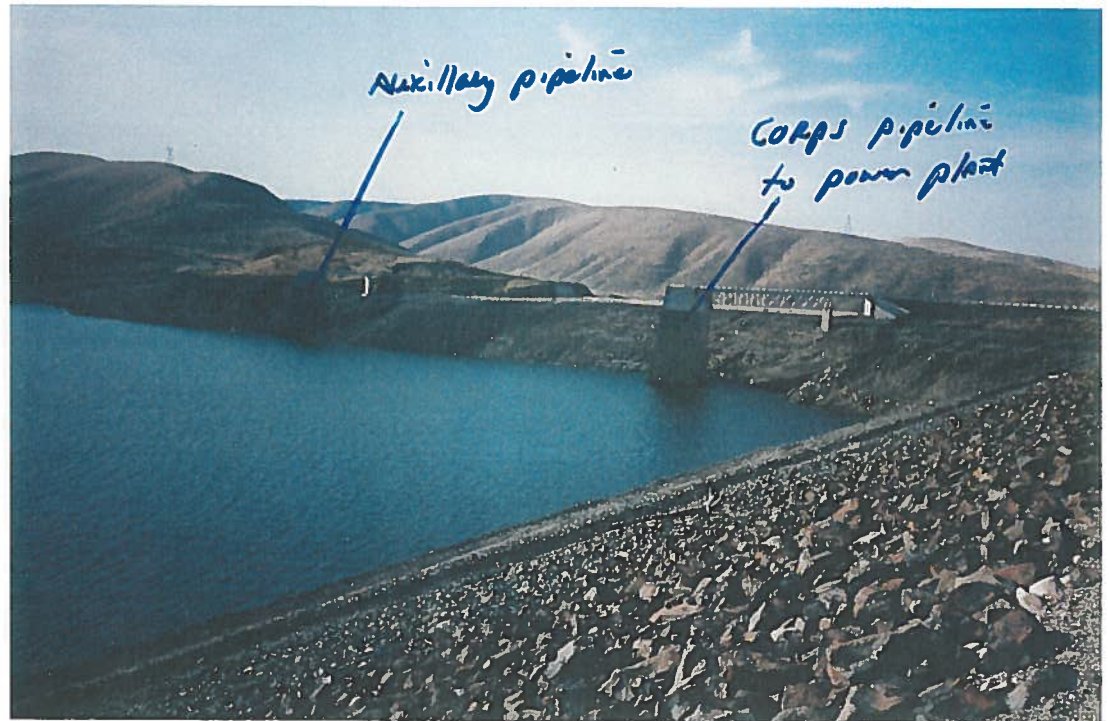
- Power plant on-line Oct. 1988. Exam 10/93, about average year ±.
- Previous Boise River transfers (63-165, 63-169, 63-243) REVEALED 1980 is ± REPRESENTATIVE year for AVERAGE flows (c 5% above normal average).
- AVERAGE of 1988-1993 = 1,297,476 vs. 1928-1993 AVERAGE = 1,947,568.

-82

b.w. period between 1st power & field exam date.

P/O e intake
structure for
Corps' pipeline
through dam to
power plant.
View is to SW
e upstream side
of Lucky Peak Dam.

PHOTO ONE-



>

P/O view
from access
road across
Lucky Peak
Dam. View
is downstream.

PHOTO TWO-



Permit 63-9019
63-11069

Photos taken 10/27/93

Pg 2 of 2



Mainline in power plant with Accusonic flowmeters attached.

PHOTO THREE-

TOP
↑
View
↓
Bottom



Flowmeter display panel (also at bottom left of photo #3).

PHOTO FOUR-

63. 9019

5700 cfs

63 11069

2500 cfs ($>$ flows
in 63.9019)

HC33 Box 1026 Boise 83706

344-7022 $\rightarrow$ 10/27/93
w/ Dennis Lammela

address -

Title - Admin. Assistant - Lucky Pl
Project

phone - 344 7063

B-K I.O. Employee

- TOTAL ft. head

- KW capacity - any data to verify

- FLOW DATA { - M. D.

;

- RECORDS to show

VOLUME DATA

- MAX

- average rate/period (month? week?) for
this water year (or Normal Hw yr.) to
show V_R (Normal volume)

need gallons per — for # of ~~days~~
days, wks, etc
in a yr.

~~Pressure?~~

Diagram

- schematic provided?

NOTES c 10/27/93

Field Exam

63-9019

63-11069 -FL

10/23

Disasters Employed this I.O. , ~~He~~ He is Admin. of Lucky M.
Project for Power

B-K I.O.
N.M. " } runs project
Wilder "
Big Bend "

Bowie Project - operating unit of I.O.
N.Y. I.O. not participating in project

HC 33 has 1026 address to use

HGAP

Full pool 3055'
M.D. " 2905'

Range 90'-240 or 250'

tailwater $\approx$ ~~2800~~ 2815

KW capacity

nameplate rating 101.25 kW
max Run 101.9 kW
" Generator 112.5 kW

Current units? for pressure
L check & discuss

this is value use for
project info

... means e 101 MW entire plant

"Crops"
tunnel

22' diam, then 23' diam to D'ham
(steel partition)

(hand on
map)

2 outlets downstream of part of power

3 generators - all gravity

M.O. - Acoustic ^{flowing} - automatic system ; 1 is each
of 3 servos for the 3 generators

Plans submitted - computer; to Bm. Hydromet System

- Copy ✓ 1989 wk memo* (J.L. Carson = Head wk Eng. Mach Design)
- ✓ diagram of down-stroke pipe - about
 - ✓ 4/19/89 pg of 6613 cfs
 - ✓ Af for system protect

(* 8151 cfs threat max to damage to units)

Power to → Seattle City Light via 29 Power lines

Economics, res. levels & water demands other users, physical limit of system

6613 cfs 4/19/89 max recording from system

★ Use 1989 memo to read lic. cfs

↓
This is basis for the water filings:

- 1) 1919 filed < project plans made, then
- 4) 1989 memo, then
- 3) the 11069 filed for extra Azo

VOLUME use to A.C. through system

P.L. Est. $\geq 95\%$ over from power system

$\bar{X}$ - lower actual corner
P.L.A.

3 wk spill (see 2296 cfs - 4/12/89)
4000 A.F. x 20 days
- 80,000 A.F.
De mark

Volume

1989 Datapoint:

max flow average (50 mt)

part 1 power) 2296 yd (4/22)

~ 4000 mt/day for 20 days,

c 80% mt A-B not used in power

(- from X A-B-A. datapoint)

90-92 all the power line

"lost
core"

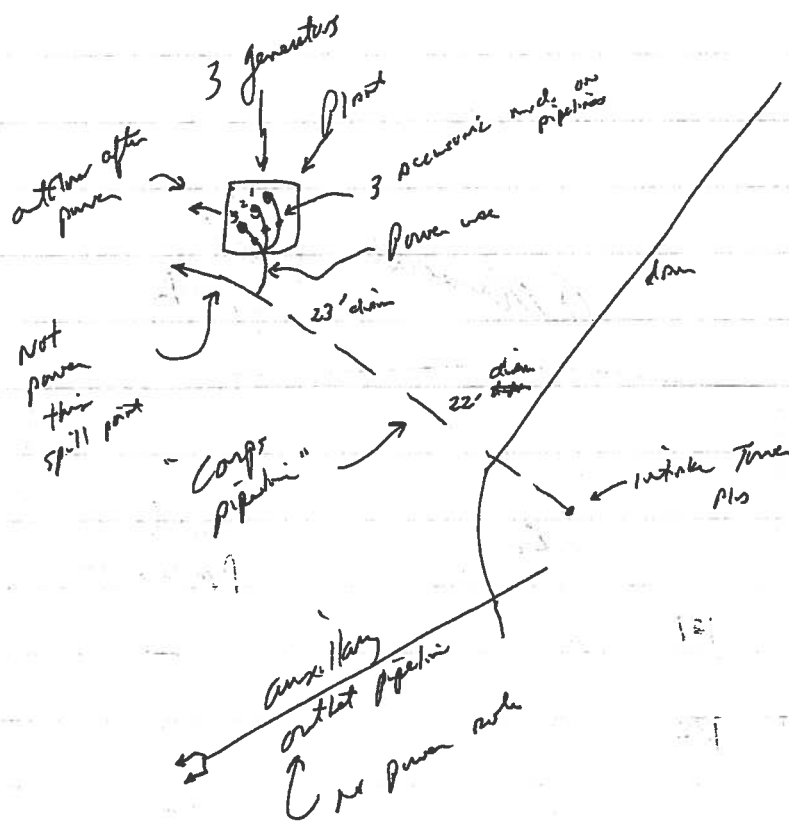
Oct 1988

power plant came on line

use 1989 - present A-B-A. volume from

1923-1943 datapoint to Est volume

c 95% used in power



Acoustic Meters

8 SENSORS per pipe w/
data base nearby

model # 7430 A

digits display from all
3 units is over below

Summation
unit is
control
Pm

over

14' 14' 7' → 3 lines & flowmeters.

Burst Corps decides how much to release &
Power Prg. & control this on Leds is resonant

Accession Model 7430A

IN Control Run of Power Plant

data from 14' pipe m.c.

14' pipe m.c.

7' pipe m.c.

Unit

Unit

Unit

131

132

133

cts

—

—

—

inlet pressure ft

—

—

—

total

cts

—

tailrace level ft

—

inlet pressure ft - tailrace level ft = ft. of hd.

Accession

Displays all data from 3 accessions on turbine pipelines. Data from summation control is fed into Bus. Hydromet.

Army Corp contacts them daily to tell what to do.

Control Room - controls & measures all releases from

Reservoir

→ Dux pipe (no power)

Flow on a display

→ Corp pipe - splits into 2 parts: ... etc - no power

Turbines

2 big, 1 small

2 big need c 800 g/s each to run

1 small need c 100 g/s to run

Photos

1) Digby bar for accoustic on 7' (small) turbine
pipeline

2) accoustic sensors (are 8/pip) on 7' turb. → pipe.

3) Look at R. Port (P/W) from top of
dike

4) Intake Tower - P/W for "Corps Pipeline"
for p. plant

- one on R. = Corps pipe,
one on L. = aux. in tunnel

faken from
same
spot on
dike

Photo costs $\approx$ \$100 M. to ~~build~~ bring on
line