

A. GENERAL INFORMATION

Permit No. 63-32421

1. Owner: Boise State University Phone No.: 208-426-1011

Current Address: Office of the President, 1910 University Dr., Boise, ID 83725

2. Accompanied by: Steve Swain EXAM DATE: May 22, 2009

Address: same as above Phone No. 208-426-1375

Relationship to Permit Holder: Director of Facilities Operations and Maintenance

3. Source: Ground Water tributary to _____

B. OVERLAP REVIEW

1. Other water rights with the same place of use: municipal water rights (United Water Idaho), surface water rights for irrigation (South Boise Water Company), and supplemental irrigation ground water rights (Boise State University)

2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM

1. Point(s) of Diversion:

[illegible]

2. Place(s) of Use:

Indicate Method of Determination: exam, aerial photo

[illegible]

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe id as applicable. See Attachment C

Scale: 1" = _____

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

☒ 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
Cooling Well		7.5	Submersible	Sta-Rite	Model 190K6

*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
Pump curve						

2. **Measurements:** Pump curve supplied by Boise Valley Pump (Attachment B)

Pumping Water Level (PWL): The well log shows 250 gpm from 51'. Static water level was reported at 20'. Pump was set at 96'. Assume PWL at 50'. Minimum discharge pressure = 20 psi. Friction loss is estimated at 4'.

Total Dynamic Head (TDH): $54' + (20' \times 2.31) = 100'$

Discharge rate at 100' TDH = 0.423 cfs (from pump curve)

E. NARRATIVE/REMARKS/COMMENTS

A 10-inch well equipped with a 7.5 hp submersible pump, provides ground water for use in a cooling system used to supply conditioning for three buildings at Boise State University; the Liberal Arts Building, Special Events Center and the Hemingway Western Studies Center. The use was initiated in the 1960s and has been on-going since that time. Cooling is achieved with a Trane 225 Ton Chiller/Condenser, operated to produce a constant water discharge temperature of 90 degrees Fahrenheit through use of a modulating valve. During cooler weather, the pump produces at lower rates and higher discharge pressures. During hot weather, the pump produces at higher rates and lower discharge pressures.

The Hemingway Western Studies Center was built in the late 1930s and the Liberal Arts Building was built in the early 1960s. Both buildings are rated poor in energy efficiency due to masonry construction, lack of insulation, thin walls and single paned windows. The Special Events Center was built in the early 1990s with weatherproofing, standard insulation and few windows allowing for a better energy efficiency rating.

Use is non-contact cooling and entirely non-consumptive. The spent cooling water is combined with irrigation wastewater and discharged to the Boise River through 18" buried mainline. The cooling well draws water from 160 to 173 feet within the permit's authorized water bearing zone. No other water rights are used.

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

F. FLOW CALCULATIONS

Yes Additional Computation Sheets Attached
(Attachment B: pump curve)

Measured Method:

7.5 hp pump curve: 190 gpm or 0.423 cfs at 100 feet TDH

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:

Required: 1815.4 afa - Attachment D: Cooling Spreadsheets

The cooling spreadsheets assume 5.1 deg F temperature change. Actual water temperature change with existing chiller is approximately 35 degrees F (i.e., 55 degrees in, 90 degrees out). Therefore, requirement can be reduced to 14.6% (5.1/35) of calculated requirement, or 264.5 afa.

Potential: $0.42 \text{ cfs} \times 185 \text{ days} \times 1.9835 = 154.1 \text{ afa}$

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
Cooling	1/1	12/31	0.42 cfs	154.1 afa

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

I. AUTHENTICATION

Field Examiner's Name Terry M. Scanlan, P.E., P.G., Certified Water Right Examiner 10-129 Date 5/28/09

Field Examiner's Signature *Terry M. Scanlan*

Reviewer _____ Date _____



ATTACHMENT A

PERMIT RECORD AND PROOF OF BENEFICIAL USE

[Close](#)IDAHO DEPARTMENT OF WATER RESOURCES
Water Permit Report

5/21/2009

WATER RIGHT NO. 63-32421

Owner Type	Name and Address
Current Owner	BOISE STATE UNIVERSITY OFFICE OF THE PRESIDENT 1910 UNIVERSITY DR BOISE, ID 83725 (208) 426-1011
Representative	SPF WATER ENGINEERING LLC C/O TERRY SCANLAN 300 E MALLARD DR, STE 350 BOISE, ID 83706 (208)383-4140

Priority Date: 08/09/2006
Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
COOLING	01/01	12/31	0.42 CFS	
Total Diversion			0.42 CFS	

Location of Point(s) of Diversion:

GROUND WATER|NWNE|Sec. 15|Township 03N|Range 02E|ADA County

Place(s) of use:

Place of Use Legal Description: COOLING ADA County

Township	Range	Section	Lot	Tract	Acres	Lot	Tract	Acres	Lot	Tract	Acres	Lot	Tract	Acres
03N	02E	15		NWNE										
				NENW										

Conditions of Approval:

- 26A Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which the permit holder had no control.
- Water bearing zone to be appropriated is from 135 to 175 feet.
- No new development is authorized.
- Cooling is for three (3) Boise State University Buildings.
- Discharge of effluent to the Boise River shall comply with water quality standards of the State of Idaho and remains subject to Section 42-3801, Idaho Code, Stream Channel alteration.
- 01M After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to use power records to determine the amount of water diverted and shall annually report the information to the Department.

Dates:

Proof Due Date: 06/01/2009
 Proof Made Date:
 Approved Date: 06/17/2008
 Moratorium Expiration Date:
 Enlargement Use Priority Date:
 Enlargement Statute Priority Date:
 Application Received Date: 08/09/2006
 Protest Deadline Date: 05/19/2008
 Number of Protests: 0
 Field Exam Date:
 Date Sent to State Off:
 Date Received at State Off:

Other Information:

State or Federal:
 Owner Name Connector:
 Water District Number:
 Generic Max Rate per Acre:
 Generic Max Volume per Acre:
 Swan Falls Trust or Nontrust:
 Swan Falls Dismissed:
 DLE Act Number:
 Cary Act Number:
 Mitigation Plan: False

RECEIVED

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

MAY 29 2009

STATEMENT OF COMPLETION
FOR SUBMITTING PROOF OF BENEFICIAL USE

FOR OFFICE USE ONLY

Amt. of Fee \$: _____
Receipt No. _____
Receipt By: _____
Date Received: _____

The Idaho Department of Water Resources considers this form a statement by the permit holder(s) that development of a water right has been completed and that water has been applied to beneficial use to the extent described below. **This form must be accompanied by an examination fee, when necessary, or by a completed Beneficial Use Field Report prepared by a certified water right examiner.** Please refer to the instructions and fee schedule for this form. If ownership of the permit has changed, please contact any Department office or visit the Department's website at: www.idwr.idaho.gov for an *Assignment of Permit* form. If you wish to relinquish your permit because you have not established the authorized use of the water and are not applying for an extension, please notify the Department in writing.

1. Permit No. 63-32421 Telephone No. 208-426-4140
2. Name of Permit Holder(s): Boise State University
3. Mailing Address: Office of the President, 1910 University Dr. City Boise
State ID Zip 83725 Email: _____
4. Source of Water: Ground Water If **GROUND WATER** (well), Date Drilled: mo. 07 / yr. 1966
Well Driller: u/k Drilling Permit Number: u/k
5. Extent of use(s) completed (as authorized by the water right permit):
Domestic (No. of households): _____ Stockwater (No. and type of stock): _____
Irrigation (No. of acres): _____ Other: Cooling
6. Total rate of diversion or storage volume for which proof is submitted: 0.42 cfs OR _____ acre-feet.
7. Compliance with a Measuring Device requirement and/or other Conditions of Permit: *(Refer to the approval conditions on your permit and respond accordingly.)*

Measuring Device: Is a measuring device required?
If yes, has the measuring device been installed?

Yes ☐ or No ☒
Yes ☐ or No ☐

Conditions of Permit: Does your permit require you to submit additional information in connection with your proof of beneficial use? (If yes, please list the conditions below and provide documents if necessary.)

Completed?

Yes ☐ or No ☐

Completed?

Yes ☐ or No ☐

8. Fee Enclosed: \$ 0 (no fee required because field exam has been completed) (See Fee Schedule on back of the instructions for filing proof of beneficial use.)

Proofs filed without an appropriate fee, will be considered incomplete.)

9. Person to contact to accompany the Department representative during field examination of the water system.

Name: NA - Field exam has been completed Telephone Number: _____
Mailing Address: _____ City: _____

State: _____ Zip: _____ Email: _____

10. *The information given on this form is my true statement of the extent to which the above numbered permit has been developed and water has been diverted and applied to a beneficial use. I understand that any undeveloped portion of the permit is relinquished to the State of Idaho.*

Signature of permit holder: Steve Suran Director of Facilities O&M Date: 5/28/09
(include your title, if on behalf of company or organization)



ATTACHMENT B
WELL LOG & PUMP CURVE

REPORT OF WELL DRILLER
State of Idaho

State law requires that this report shall be filed with the State Reclamation Engineer within 30 days after completion or abandonment of the well.

WELL OWNER:
Name Boise College - LIBERAL ARTS

Address College Blvd., Boise, Idaho

Owner's Permit No. _____

NATURE OF WORK (check): Replacement well ☐
New well ☒ Deepened ☐ Abandoned ☐

Water is to be used for: air conditioning

METHOD OF CONSTRUCTION: Rotary ☐ Cable ☒
Aug ☐ Other _____

(explain)

CASING SCHEDULE: Threaded _____ Welded ☒

10 "Diam. from 0 ft. to 130 ft.

"Diam. from _____ ft. to _____ ft.

"Diam. from _____ ft. to _____ ft.

"Diam. from _____ ft. to _____ ft.

Thickness of casing: _____ Material: _____

Steel ☒ concrete ☐ wood ☐ other ☐

(explain)

PERFORATED? Yes ☒ No ☐ Type of perforator used: _____

Size of perforations: 1/16 " by 6 "

perforations from 173 ft. to 263 ft.

perforations from _____ ft. to _____ ft.

perforations from _____ ft. to _____ ft.

perforations from _____ ft. to _____ ft.

WAS SCREEN INSTALLED? Yes ☐ No ☐

Manufacturer's name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

CONSTRUCTION: Well gravel packed? Yes ☒

No. ☐ size of gravel 3/4" agg. Gravel

placed from 160 ft. to 173 ft. Surface seal

provided? Yes ☐ No ☐ To what depth?

_____ ft. Material used in seal: hard shale

a hoe driven right into shale making seal.

Did any strata contain unusable water? Yes ☐

No. ☐ Type of water: _____

Depth of strata _____ ft. Method of sealing

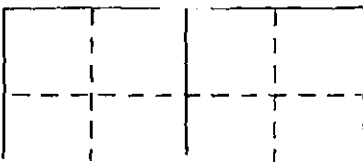
strata off: cased with clay seal on bottom

Set drive shoe in blue clay (shale)

Surface casing used? Yes ☐ No. ☐

Cemented in place? Yes ☐ No ☒

Locate well in section



Size of drilled hole: 10" Total
depth of well: 173' Standing water
level below ground: 20' Temp.
Fahr. 55 ° Test delivery: 250 gpm
or _____ cfs Pump? ☐ Bail ☐
Size of pump and motor used to make test:

air compressor

Length of time of test: 6 Hrs. Min.

Drawdown: 31 ft. Artesian pressure: ft.

above land surface _____ Give flow _____ cfs

or _____ gpm. Shutoff pressure:

Controlled by: Valve ☐ Cap ☐ Plug ☐

No control ☐ Does well leak around casing?

Yes ☐ No ☒

DEPTH MATERIAL WATER

FROM TO YES OR N

FEET FEET

0 3 top soil no

3 33 gravel and boulders no

33 90 muddy sand ye

90 135 blue clay no

135 170 gray sandy shale no

170 172 coarse sand bottom ye

Liner dropped down 5' during development. Water seems to be between two layers of shale. Blew out pocket at bottom and filled it with coarse gravel. Dropped small gravel around it. Coarse gravel gives liner foundation to set on.

Reproduced from the University archives
in Boise State University Library

Work started: 6-25-66

Work finished: 7-7-66

Well Driller's Statement: This well was

MODEL: 150K6

SIZE: 6"

RPM: 3450

HP: 7 1/2

CURVE NO: ST1214

STA-RITE INDUSTRIES, INC.

Water Equipment Division

293 SOUTH WRIGHT STREET / DELAVAN, WISCONSIN 53115 / U.S.A

DATE: JAN., 1972

TOTAL HEAD / FEET

300

250

200

150

100

50

50

100

150

200

250

TDH

EFF

BHP

% EFF

BRAKE HORSEPOWER

100

90

80

70

60

50

40

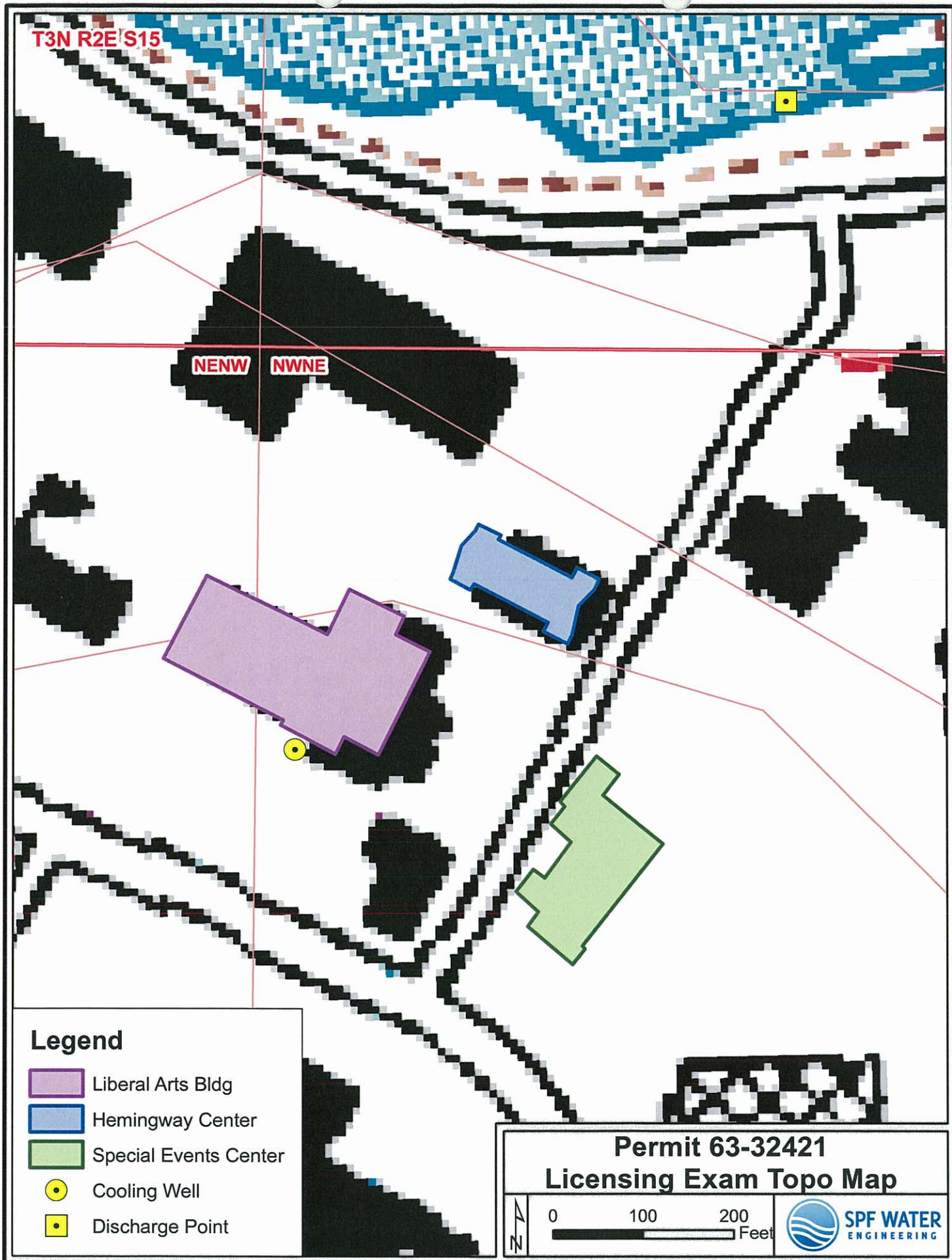
30

20

10



ATTACHMENT C
TOPO MAP AND 2007 AERIAL PHOTO



T3N R2E S15

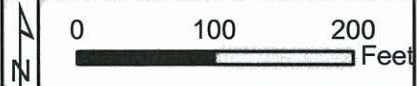
NENW

NWNE

Legend

-  Liberal Arts Bldg
-  Hemingway Center
-  Special Events Center
-  Cooling Well
-  Discharge Point

Permit 63-32421
Licensing Exam Topo Map



T3N R2E S15

NENW

NWNE

W GESAR CHAVEZ LN

S1010346610
1910

State University

S THEATRE LN

W UNIVERSITY DR

Legend

-  Liberal Arts Bldg
-  Hemingway Center
-  Special Events Center

-  Cooling Well
-  Discharge Point

Permit 63-32421
Licensing Exam 2007 Photo

0 100 200 Feet





ATTACHMENT D

COOLING SPREADSHEETS

RESIDENTIAL SPACE HEATING/COOLING REQUIREMENTS FOR COLD OR GEOTHERMAL SOURCES

Worksheet created by Cindy Hodges, 11/93.

Data entered by: Igraves
Exam Date: 05/22/09
File No: 63-32421
Computations for: Cooling; Special Events Ctr

REQUIRED DATA:

Area of livable floor space, ft2 (A)	1722458
2 story? (N=1, Y=2)	2
House efficiency factor (e) *	0.44
Inside design temperature (Ti)	72
Average outside temperature (To) **	80
Source temperature, degrees F (S)	55
Heating/cooling days per season (D)	185
Hours/day system operates (H)	12

* e values are as follows:

- 0.28 Best energy efficiency - extra insulation, caulked and weatherstripped, with storm windows and doors
- 0.44 Better energy efficiency - standard insulation, caulked and weatherstripped, with storm windows and/or doors
- 0.67 Average residence - standard insulation, no weatherproofing but with storm windows or double panes
- 1.11 Poor energy efficiency - minimal insulation, no weatherproofing or storm windows (older homes, shops or greenhouses)

** Suggested average outside temperatures:

WINTER	SUMMER
4 deg F Boise	80 deg F Boise
6 deg F Grand View	90 deg F Grand View
-8 deg F Cascade	70 deg F Cascade

CALCULATED DATA:

DESIGN HEAT LOAD (BTU/hr required)

Formula: $E = [e \times (T_i - T_o)] A$

Applies factor of 0.8 for two-story dwelling

E = 4,850,442 BTU/hour

TEMPERATURE DROP ACROSS SYSTEM

Formula: $T_s = 0.3 \times [S - T_i]$

Ts = 5.1 degrees F

FLOW RATE REQUIRED (at given source temperature)

Formula: $Q = E / (500 \times T_s) \times 448.8$

Q = 4.24 cfs

DIVERTED VOLUME OVER SEASON

Formula: $V_{div} = Q \times D \times H / 24 \times 1.9835$

Vdiv = 777.6 AFA

RESIDENTIAL SPACE HEATING/COOLING REQUIREMENTS FOR COLD OR GEOTHERMAL SOURCES

Worksheet created by Cindy Hodges, 11/93.

Data entered by: lgraves
 Exam Date: 05/22/09
 File No: 63-32421
 Computations for: Cooling; Hemingway Ctr & Liberal Arts Bldg

REQUIRED DATA:

Area of livable floor space, ft2 (A) 911258
 2 story? (N=1, Y=2) 2
 House efficiency factor (e) * 1.11
 Inside design temperature (Ti) 72
 Average outside temperature (To) ** 80
 Source temperature, degrees F (S) 55
 Heating/cooling days per season (D) 185
 Hours/day system operates (H) 12

* e values are as follows:

- 0.28 Best energy efficiency - extra insulation, caulked and weatherstripped, with storm windows and doors
- 0.44 Better energy efficiency - standard insulation, caulked and weatherstripped, with storm windows and/or doors
- 0.67 Average residence - standard insulation, no weatherproofing but with storm windows or double panes
- 1.11 Poor energy efficiency - minimal insulation, no weatherproofing or storm windows (older homes, shops or greenhouses)

** Suggested average outside temperatures:

WINTER	SUMMER
4 deg F Boise	80 deg F Boise
6 deg F Grand View	90 deg F Grand View
-8 deg F Cascade	70 deg F Cascade

CALCULATED DATA:

DESIGN HEAT LOAD (BTU/hr required)

Formula: $E = [e \times (T_i - T_o)] A$

Applies factor of 0.8 for two-story dwelling

E = 6,473,577 BTU/hour

TEMPERATURE DROP ACROSS SYSTEM

Formula: $T_s = 0.3 \times [S - T_i]$

Ts = 5.1 degrees F

FLOW RATE REQUIRED (at given source temperature)

Formula: $Q = E / (500 \times T_s) \times 448.8$

Q = 5.66 cfs

DIVERTED VOLUME OVER SEASON

Formula: $V_{div} = Q \times D \times H / 24 \times 1.9835$

Vdiv = 1037.8 AFA

Hemingway Ctr: 94,579 ft2

Liberal Arts Bldg: 816,679 ft2

ATTACHMENT E

PHOTOS



Point of Diversion



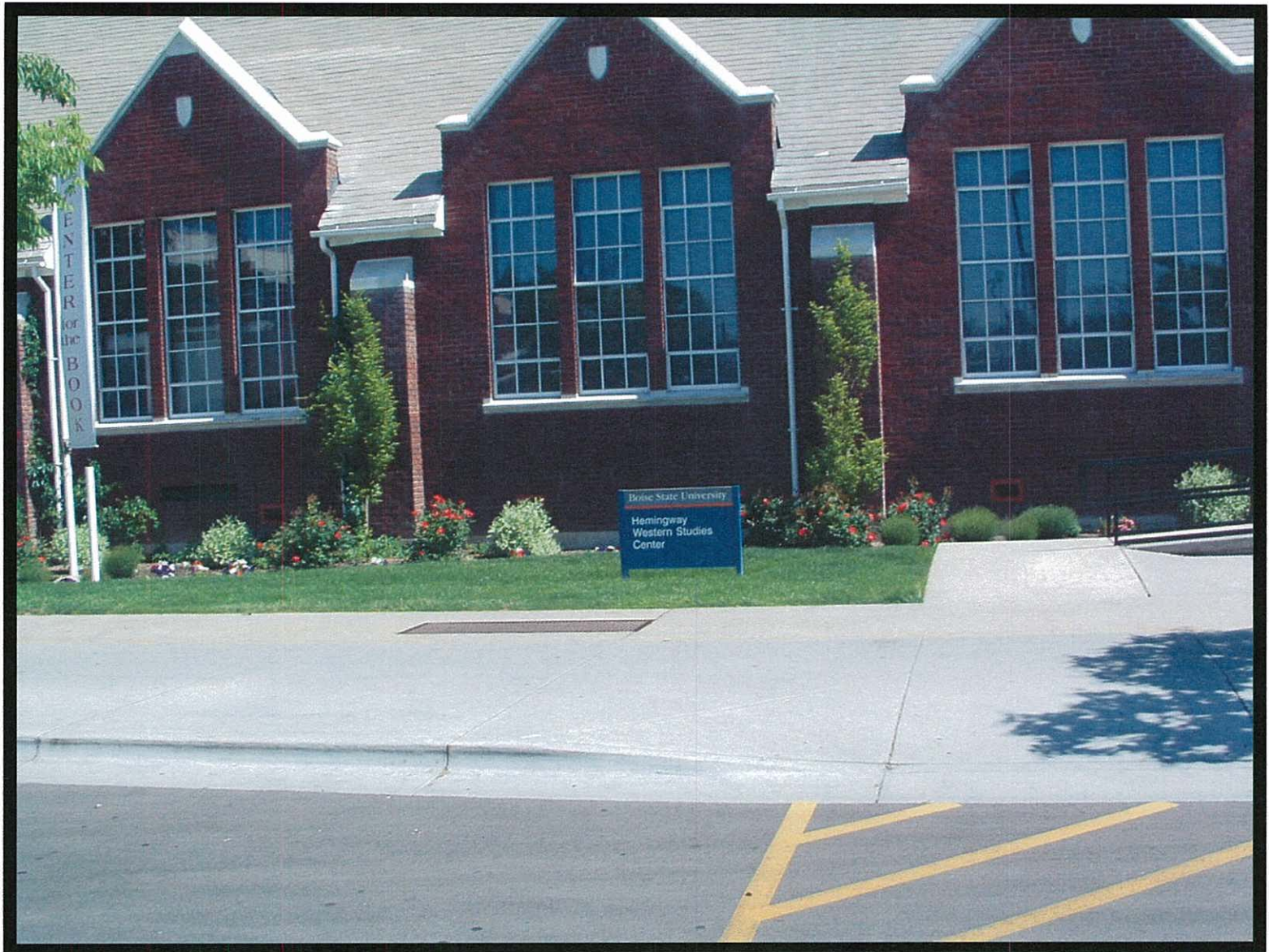
Entrance Pipe from Well to Cooling System



Trane 240 Ton Chiller/Condenser Cooling System



Place of Use: Liberal Arts Building



Place of Use: Hemingway Western Studies Center



Place of Use: Special Events Center



Spent Cooling Water Discharge to Boise River