

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 35-14283

Exam Date: 2/16/2016

1. Current Owner:
IDAHO FALLS SCHOOL DISTRICT #91 690 JOHN ADAMS PARKWAY IDAHO FALLS ID 83401
(208)525.7500

2. Accompanied by: Kevin Klinger
Phone No: 208 525 7585 ext 50286
Relationship to Permit Holder: Director of Operations for Idaho Falls School District 91

3. SOURCE: GROUND WATER**B. OVERLAP REVIEW**

1. Other water rights with the same place of use: City of Idaho Falls provides drinking water
2. Other water rights with the same point-of-diversion: None

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER SW¼NE¼ Sec. 23, Twp 02N, Rge 37E, B.M. BONNEVILLE County

Method of Determination: GPS and ArcMap

2.

PLACE OF USE: HEATING

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
02N	37E	23			X														

COOLING same as HEATING

Method of Determination: Aerial Photography and ArcMap

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.

 Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

 X Aerial Photo Attached (required for irrigation of 10+ acres).

 X Photo of Diversion and System Attached

4. Pump Information

50 HP submerged Pump

D. FLOW MEASUREMENTS

During the examination the system would cycle on and off. However, the Director of Operations for the School District did not have the ability to enable the system to full capacity, so no direct measurement could be taken.

The engineer who designed the system, Bill O'Donnell of Quantum Group Engineering, provided that the pump is 50 HP.

E. FLOW CALCULATIONS

 X Additional Computation Sheets Attached

See attached theoretical calculation for 1.23 cfs (549.9 gpm).

F. VOLUME CALCULATIONS

The diversion well does not run on a set schedule. Instead, a "Generalized Schedule" was provided by Bill O'Donnell of Quantum Group Engineering with the application for permit. The Director of Operations for the School District acknowledged that the Generalized Schedule was accurate. Below, the Generalized Schedule was used to calculate the water right's annual volume, with some noted assumptions.

There are six distinct operating periods throughout the year: warm-up on occupied mornings in the winter; occupied days in the winter; winter holidays, weekends, and nights; early and late winter days; spring and fall occupied days; spring and fall nights.

The Generalized Schedule included summers; however, the Director of Operations said that the system does not operate in the summer. The consultant's Generalized Schedule made no distinction for late-starts or early releases, so none are made in this review. It is assumed that the well runs at 300 gpm when it is running (per bullet 5 in the Generalized Schedule), except for winter mornings, when it runs at maximum capacity. The school year schedule use for this volume calculation is based on the 2015 – 2016 school year, which was a leap year.

In the Generalized Schedule, winter is defined as late November, December, January, and early February. An assumption was made that this is a 13 week period, including the final two weeks in November, the 31 days each in December and January (totaling 8.86 weeks), and the first 15 days in February (2.14 weeks).

Occupied Winter Mornings – Warm Up

13 winter weeks * 5 days/week occupied = 65 occupied days – 5 days for Thanksgiving break – 10 days for Christmas break – 1 day for Presidents Day = 49 occupied days during the winter * 2 hours/day (7 am – 9 am) = 98 hours/winter * 60 minutes/hour = 5880 minutes/winter * 549.9 gallons/minute (max of system) = 3,233,412 gallons/winter mornings / 325850 gallons/AF = 9.92 AF. The assumption was made that the pump runs for the entire two hour warm up period.

Occupied Winter Days

Class is in session from 9 am – 3:05 pm, which was rounded up to 4 pm in this calculation, for a total of seven hours/day.

49 occupied days * 7 hours/day = 343 hours of occupied time during the winter * 2/3 of time spent running (assumed, see below) = 228.67 hours/winter running * 60 minutes/hour = 13720 minutes/winter * 300 gpm (per generalized schedule) = 4,116,000 gallons/winter / 325,850 gallons/AF = 12.63 AF during occupied winter days.
The assumption was made that the generalized schedule's "much of the occupied day" meant 2/3 of the time. Further, during the site visit the system seemed to run about 2/3 of the time.

Winter Nights, Weekends, and Holidays

16 holiday days (5 for Thanksgiving + 10 for Christmas + 1 for Presidents Day) * 24 hours/day = 384 holiday hours
13 weeks * 2 weekend days/week = 26 weekend days * 24 hours/day = 624 weekend hours
49 nights of occupied days * 15 hours/occupied night (4 pm – 7 am) = 735 hours of nights of occupied days
384 + 624 + 735 = 1743 hours of winter nights, weekends, and holidays * 60 minutes/hour = 104,580 minutes * 16.67% of the time that the system runs (assumption, see below) = 17,433.5 minutes that system runs * 300 gpm = 5,230,050 gallons / 325,850 gallons/AF = 16.05 AF.
16.67% of an hour is 10 minutes. The consultant states that the system will run a vague "number of times" during the above timeframe. The Director of Operations said that the system would likely run once an hour, for ten minutes a cycle, on the coldest of nights. The school is allowed to cool down at night and over the weekend (hence the intensive warm up period in the mornings), and the building's insulation is very efficient.

Early and Late Winter

The Generalized Schedule reads "Early and late winter, well pump will be on and off throughout the day and be off at night." It is assumed that "early and late winter" includes four additional weeks on either side of the 13 week winter. Each day and night are assumed to be 12 hours. No distinction is made between occupied day and weekend or holiday days. Finally, with the well cycling "on and off," it is assumed to run 20% of the time.
8 weeks * 7 days/week * 12 hours day = 672 hours * .2 = 134.4 hours * 60 minutes/hour = 8064 minutes * 300 gallons/minute = 2,419,200 gallons / 325,850 gallons/AF = 7.42 AF used in the early and late winter.

Spring and Fall Occupied Days

The Generalized Schedule reads "Spring and fall the well pump will cycle a few times during the occupied day and not at night." It does not define spring and fall, so it is assumed to be the remainder of the school year outside of winter and early and late winter. That includes one day in August, 21 days in September, 13 days in October, 8 days in March, 21 days in April, 21 days in May, and 3 days in June, for a total of 88 occupied days. "A few times" is assumed to mean once per hour, for ten minutes (similar to Winter Nights, Weekends, and Holidays).
88 occupied days * 7 hours/occupied day = 616 hours * 60 minutes/hour = 36,960 minutes * 16.67% of the time that the system runs = 6161.2 minutes that the system runs * 300 gpm = 1,848,360 gallons / 325,850 gallons/AF = 5.67 AF

Spring and Fall Nights

The generalized schedule contradicts itself, in one sentence saying that the system will not cycle on at night, and in the next saying that it may start and run a few times during nights. Because the system is non-consumptive, it is assumed that the well does run at night, and again for 10 minutes once each hour. The night is assumed to be 12 hours, and no distinction is made between weekend nights, holiday nights, and occupied-day nights. Therefore, there is one night in August, 30 nights in September, 19 nights in October, 17 nights in March, 30 nights in April, 31 nights in May, and two nights in June, totaling 130 nights.
130 nights * 12 hours/night = 1560 hours * 60 minutes/hour = 93,600 minutes * 16.67% of the time that the system runs = 15,603 minutes * 300 gallons/minute = 4,680,936 gallons / 325,850 gallons/AF = 14.37 AF.

In sum, 9.92 AF + 12.63 AF + 16.05 AF + 7.42 AF + 5.67 AF + 14.37 AF = 66.06 AF

G. NARRATIVE/REMARKS/COMMENTS

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
HEATING	01/01 to 12/31	1.23 CFS	66.1 AF
COOLING	01/01 to 12/31	1.23 CFS	66.1 AF
	<u>Totals:</u>	1.230 CFS	66.10 AF

2. Recommended Amendments

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

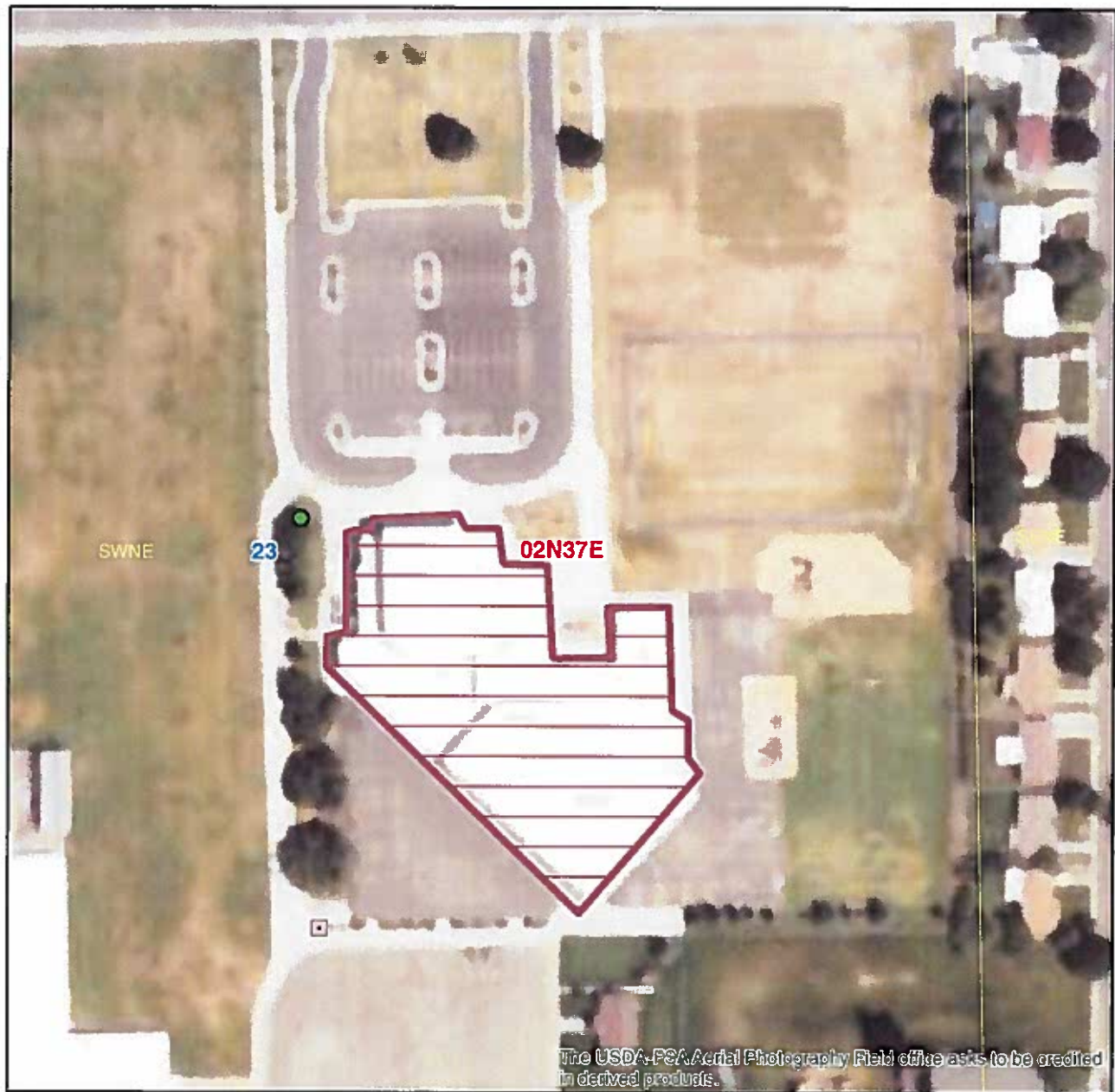
☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION

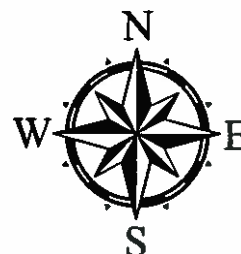
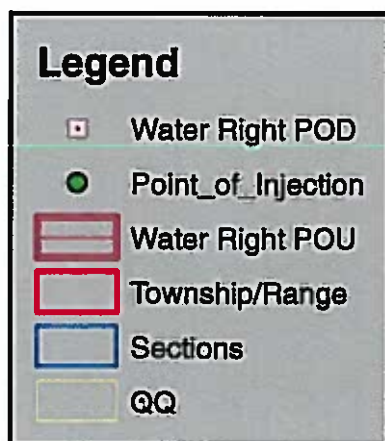
Field Examiner's Name Cooper Fritz Date 5/23/2016

Reviewer James Cefalu Date 6/20/16

35-14283 POU, POD, and Point of Injection at Licensing



2015 Imagery



0 0.0175 0.035 0.07 Miles



Point of Diversion



Injection Well



IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT1. WELL TAG NO. D 0062809

Drilling Permit No. _____

Water right or injection well # _____

2. OWNER: Ethel BoyesName Idaho Falls School District 91 NorthAddress 690 John Adams ParkwayCity Idaho Falls State ID Zip 83401

3. WELL LOCATION:

Twp. 2 North ☒ or South ☐ Rge. 37 East ☒ or West ☐Sec. 23 1/4 SW 1/4 NE 1/4Gov't Lot _____ County BonnevilleLat. 43° 29.51982 (Deg. and Decimal minutes)Long. 112° 04.20522 (Deg. and Decimal minutes)Address of Well Site 1875 BrentwoodCity Idaho Falls

(Give at least name of road or distance to road or landmarks)

Lot _____ Blk. _____ Sub. Name _____

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection☒ Other Heating & Cooling

5. TYPE OF WORK:

☒ New well ☐ Replacement well ☐ Modify existing well☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☒ Air Rotary ☐ Mud Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method/procedure
<u>Bentonite</u>	<u>0</u>	<u>195</u>	<u>3.2 yds</u>	<u>Drill</u>

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing Liner	Threaded	Welded
<u>10"</u>	<u>+2</u>	<u>195</u>	<u>.25</u>	<u>steel</u>	☒	☐	☒
<u>8"</u>	<u>192</u>	<u>296</u>	<u>.25</u>	<u>steel</u>	☐	☒	☒

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) _____

9. PERFORATIONS/SCREENS:

Perforations ☒ Y ☐ N Method TouchManufactured screen ☐ Y ☐ N Type _____

Method of Installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
<u>192</u>	<u>296</u>	<u>1/4" x 1/4"</u>	<u>200</u>	<u>8"</u>	<u>steel</u>	

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☐ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method
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11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☐ N Artesian Pressure (PSIG) _____

Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 159' Static water level (ft) 159'

Water temp. (°F) _____ Bottom hole temp. (°F) _____

Describe access port _____

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)
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Test method:

Pump	Bailer	Air	Flowing artesian
☐	☐	☐	☐

Water quality test or comments: _____

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water	
				Y	N
<u>18"</u>	<u>0</u>	<u>24</u>	<u>Overburden</u>		
<u>16"</u>	<u>24</u>	<u>134</u>	<u>Black, firm basalt</u>		
	<u>134</u>	<u>138</u>	<u>Soft basalt, lost returns</u>		
	<u>138</u>	<u>147</u>	<u>Soft broken basalt</u>		
	<u>147</u>	<u>155</u>	<u>Soft basalt</u>		
	<u>155</u>	<u>195</u>	<u>Medium basalt</u>		
<u>10"</u>	<u>195</u>	<u>200</u>	<u>Medium basalt</u>		
	<u>200</u>	<u>202</u>	<u>Soft rock/clay</u>		
	<u>202</u>	<u>207</u>	<u>Soft basalt, casing a little</u>		
	<u>207</u>	<u>208</u>	<u>Fractured & broken bit plugging</u>		
	<u>208</u>	<u>218</u>	<u>Soft basalt</u>		
	<u>218</u>	<u>224</u>	<u>Soft & broken, like previous/clay</u>		
	<u>224</u>	<u>228</u>	<u>Soft broken rock</u>		
	<u>228</u>	<u>246</u>	<u>Med. basalt</u>		
	<u>246</u>	<u>247</u>	<u>Fracture</u>		
	<u>247</u>	<u>272</u>	<u>Med. rock</u>		
	<u>272</u>	<u>273</u>	<u>Fracture</u>		
	<u>273</u>	<u>283</u>	<u>Med basalt</u>		
	<u>283</u>	<u>297</u>	<u>Soft rock w/ clay layers</u>		
<u>6"</u>	<u>297</u>	<u>307</u>	<u>Med. basalt, sm. fractures</u>		
	<u>307</u>	<u>308</u>	<u>Broken</u>		
	<u>308</u>	<u>317</u>	<u>Medium basalt</u>		

RECEIVED

FEB 14 2013

Department of Water Resources
Eastern RegionCompleted Depth (Measurable): 297'Date Started: 10/22/12Date Completed: 10/29/12

14. DRILLER'S CERTIFICATION:

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name W.D. Dunning Drilling Co. No. 519*Principal Driller W.D. Dunning Date _____*Driller W.D. Dunning Date 11/6/12

*Operator II _____ Date _____

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right No.: 35-14283
Examiner: Cooper Fritz
Date of Field Exam: 2/16/2016

P/D No.:

PUMP HORSEPOWER 50
BOOSTER HORSEPOWER 0

PUMPING LEVEL 159

DISCHARGE PRESSURE 40

FRICTION 0

RATE OF FLOW (cfs) 1.23
(gpm) 549.9

The above calculates the formula =
$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %70 efficiency.

Examiners Notes:

Lift was taken from well log. Hp was provided by Bill O'Donnell , who designed the system. A standard psi for heating and cooling use of 40 to 60 psi was used to estimate the pressure against the pump.

Idaho Falls School District 91 Calendar 2015-2016

Adopted 12/10/2014

Updated 9/17/2015

July					Key to Abbreviations					January					Updated 9/17/2015					
M	T	W	TH	F	K = Kindergarten	Pre-K = Preschool				M	T	W	TH	F						
		1	2	3	ES = Elementary Schools										1 Dec 21 - Jan 1 Christmas Vacation - No School					
6	7	8	9	10	MS = Middle Schools					4	5	6	7	8						
13	14	15	16	17	HS = High Schools					11	12	13	14	15	STAR Assessment Jan. 4 - Jan. 29					
20	21	22	23	24	Access 2.0 = Assessment for Comp. and Comm. for ELL					18	19	20	21	22	Interim Assessment Block - 2nd Trimester					
27	28	29	30	31	IRI = Idaho Reading Indicator					25	26	27	28	29	Grades 3-11					
					ISAT 2.0 = Idaho Standardized Achievement Test															
August					PT Conferences = Parent/Teacher Conferences					February										
M	T	W	TH	F	PSAT = Pre Scholastic Aptitude Test					M	T	W	TH	F	Access 2.0 Assessment Feb. 8 - May 20 (Replaces IELA)					
3	4	5	6	7	SAT = Scholastic Aptitude Test					1	2	3	4	5						
10	11	12	13	14						8	9	10	11	12						
17	18	19	20	21	21 Teacher Workday - No School					15	16	17	18	19	15 Presidents Day - No School					
24	25	26	27	28	24 - 28 Teacher Inservice/Workdays - No School					22	23	24	25	26						
31					26 Elementary Back-to-School Night					29										
					○ Late Start Monday															
September					31 First Day of School K through 9th Grade & Emerson					March					4 End of 2nd Trimester					
M	T	W	TH	F	31 MS & HS Back-to-School Night					M	T	W	TH	F	7 Teacher Workday - No School					
	1	2	3	4	1 First Day of School Grades 10-12						1	2	3	4	10 Early Dismissal Grades 1-6 for ES PT Conf. - No School K & Pre-K					
7	8	9	10	11	3 First Day of School Pre-K					7	8	9	10	11	11 ES PT Conferences - No School ES					
14	15	16	17	18	7 Labor Day - No School					14	15	16	17	18	21-25 Spring Break - No School					
21	22	23	24	25						21	22	23	24	25						
28	29	30			IRI Assessment Aug. 17 - Sept. 25					28	29	30	31							
					STAR Assessment Sept. 1 - Sept. 30										ISAT 2.0 Assessment Mar. 28 - May 20					
October										April										
M	T	W	TH	F						M	T	W	TH	F						
			1	2	2 State & District Inservice - No School									1	IRI Assessment Apr. 4 - May 2					
5	6	7	8	9						4	5	6	7	8						
12	13	14	15	16	14 PSAT Assessment - Grade 10					11	12	13	14	15	12 SAT Assessment - Grade 11					
19	20	21	22	23						18	19	20	21	22						
26	27	28	29	30						25	26	27	28	29						
November										May										
M	T	W	TH	F						M	T	W	TH	F	STAR Assessment May 2 - May 27					
2	3	4	5	6						2	3	4	5	6						
9	10	11	12	13						9	10	11	12	13						
16	17	18	19	20	20 End of 1st Trimester					16	17	18	19	20						
23	24	25	26	27	23 Teacher Workday - No School					23	24	25	26	27						
30					24-27 Thanksgiving Holiday - No School					30	31					30 Memorial Day - No School				
December															31 Compass Academy & Emerson HS Graduation					
M	T	W	TH	F						June										
		1	2	3	3 Early Dismissal Grades 1-6 for ES PT Conferences - No School K & Pre-K					M	T	W	TH	F	1 IFHS Graduation					
7	8	9	10	11	4 ES PT Conferences - No School ES							1	2	3	2 SHS Graduation					
14	15	16	17	18	Dec 21 - Jan 1 Christmas Vacation - No School					6	7	8	9	10	3 End of 3rd Trimester					
21	22	23	24	25						13	14	15	16	17	3 Last Day of School - Early Dismissal					
28	29	30	31							20	21	22	23	24	6 Teacher Workday					
										27	28	29	30							

Start/End Time	Schools	Start/End Time	Early Dismissal Schedule
Tues - Friday		Late Start Monday	
8:00 - 2:05	Bunker, Fox Hollow, Linden Park	9:00 - 2:05	1:00 p.m.
8:00 - 2:50	Erickson	9:00 - 2:50	1:30 p.m.
8:10 - 2:15	Temple View	9:10 - 2:15	1:10 p.m.
8:20 - 2:25	Longfellow, Sunnyside, Westside	9:20 - 2:25	1:20 p.m.
8:35 - 3:35	Eagle Rock & Taylorview Middle Schools	9:35 - 3:35	12:00 p.m.
8:30 - 3:40	Idaho Falls & Skyline High Schools	9:30 - 3:40	12:00 p.m.
8:50 - 3:20	Compass Academy	9:50 - 3:20	11:40 a.m.
9:00 - 3:05	Boyes, Bush, Edgemont, Hawthorne	10:00 - 3:05	2:00 p.m.
9:00 - 3:30	Emerson HS (Day)	10:00 - 3:30	
	Emerson HS (Night) Monday - Thursday, 4:00 - 7:00 PM		

1st Trimester	Aug 31 to Nov 20	58 Days	First Day of School - August 31, 2015
2nd Trimester	Nov 30 to Mar 4	59 Days	
3rd Trimester	Mar 8 to Jun 3	58 Days	Last Day of School - June 3, 2016



Early & late winter

Data Provided by
Bill O'Donnell, P.E.
Quantum Group Engineering, PC
543 W. 19th
PO Box 51353
Idaho Falls, ID 83402
(208) 523-8068 Fax (208) 524-8235

- 1) Well pump will need to pump a maximum of 600gpm during morning warm up during cold wintertime conditions (late November, December, January, and mid February), or from about 6am to 8am and then run much of the occupied day at 300gpm, Monday through Friday. Once class is over for the day and over the weekend and holidays, the well pump will be off and will start and run a number of times throughout the night and weekend, at 300gpm.
- 2) Early and late winter, well pump will be on and off throughout the day and be off at night.
- 3) Spring and fall the well pump will cycle a few times during the occupied day and not at night. Once class is over for the day and over the weekend the well pump will be off and may start and run a few times throughout the night.
- 4) Summer the well pump will be off and would only run if there is special a school activity and the school is occupied.
- 5) Well pump is controlled by a variable speed drive that speeds the pump up and down depending on the heating or cooling demand. When running it will spend the majority of its run time at minimum speed or about 300gpm. It will be off for a majority of the year (winter/summer).
- 6) This is non-consumptive use and well water may be cooled to about 42F in winter (at 600 gpm) and heated to about 60F in summer when the pump is running at 300gpm (building will be heating dominant).