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ENGINEERING, SURVEYING & PLANNING
LANDSCAPE ARCHITECTURE, GIS
NATURAL RESOURCE SERVICES



LEVEL I NUTRIENT PATHOGEN EVALUATION

IRISH ACRES SUBDIVISION

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Prepared for:

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Driggs, ID 83422

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Driggs, Idaho 83422



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INTRODUCTION

The purpose of this document is to fulfill the requirements of a Level I Nutrient Pathogen Study to investigate the potential impacts on groundwater and surface water from on-site wastewater treatment systems. The project site is called Irish Acres Subdivision, owned by Cloud Veil LLC. It is located in the northwest quarter of the northwest quarter of section 10 of T. 5 N. and R. 45 E., B.M. in Teton County Idaho and the parcel ID is RP05N45E103300.

The proposed project is for the subdivision of a 40.14 acre parcel of land. The parcel is currently zoned "Agriculture/Rural Residential-2.5-Acre Min. Lot Size". This project is proposing to subdivide the parcel into 10 lots. There are four 2.5 acre lots in the northwest corner of the property. The remaining six lots area all 5 acres. Please see Figure 1 for the project vicinity and proposed layout.

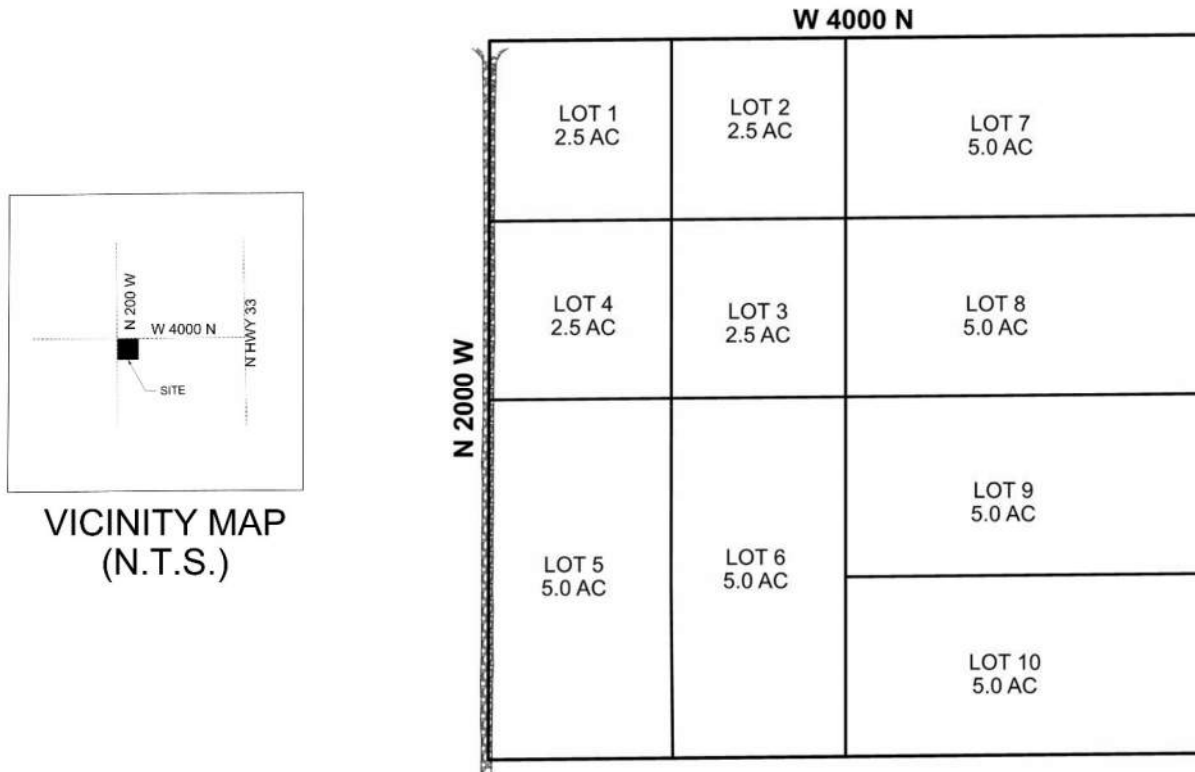


Figure 1: Project Vicinity and Layout

To start the process, Y2 on behalf of Cloud Veil LLC, submitted the application for Subdivision/Land Development Review to East Idaho Public Health (EIPH). EIPH provided preliminary approval in a letter dated June 29, 2022. Four test pits were excavated on site. There was no bedrock or groundwater encountered in any of the test holes. Test hole 1 exhibited very fine sand with some silt, becoming more gravelly with depth. Test holes 2 through 4 had loamy, coarse sand down the 120" excavation depth. The test hole locations are shown in Figure 2. The report from EIPH is included in Appendix A in its entirety of this report.

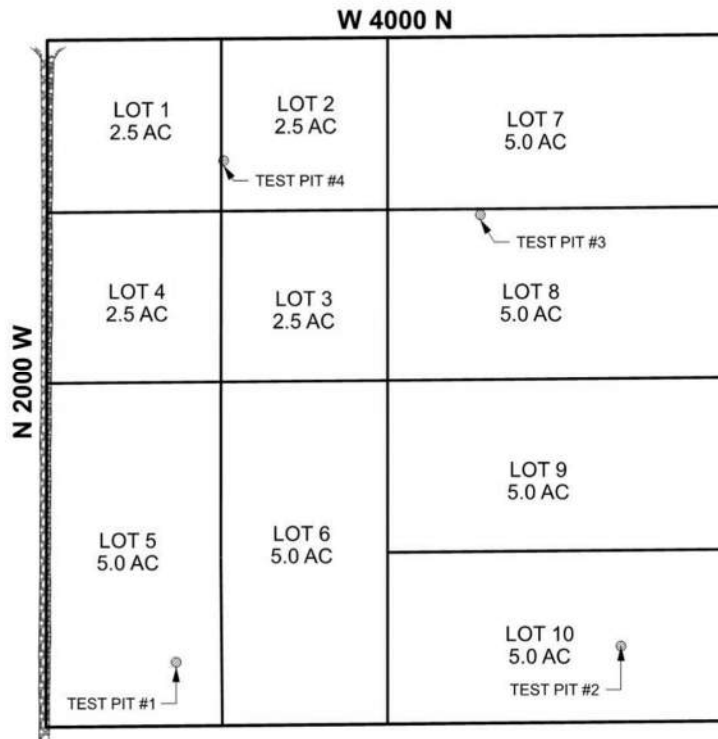


Figure 2: Approximate Test Pit Locations

The proposed site lies partially within the Wetland Overlay area and therefore a Level I Nutrient Pathogen (NP) Evaluation is required Per Subdivision Regulations of Teton County, Idaho, Title 9, Section 9-3-2-C-3-b-i-a. However, the wetlands are irrigation induced and not truly wetland areas. The following sections provide information to meet the minimum required elements for an NP evaluation.

WELL DRILLER REPORTS

Per Appendix A of Title 09, Nutrient-Pathogen Evaluation Technical Guide for On-Site Wastewater Treatment Systems in Teton County, Idaho (referred to as Guide from now on in this submittal), the first of the minimum requirements is to provide well driller reports within 1/2 mile of the project site. See Figure 3 for the area for which well driller reports were researched and cataloged.



Figure 3: Area of Well Driller Report and Compilation

The search area was all within T. 05 N. and R. 45 E. B.M. in Teton County. In section 10, the Northwest quarter, the north half of the Southwest quarter, the west half of the Northeast quarter, and the Northwest of the Southeast quarter were queried. All of section 10 was included except for the southern row and eastern column of quarter-quarters. The Southwest quarter of section 3 was included along with the western half of the Southeast quarter of section 3 were included in the search area. The area in section 3 was extended a little farther north to encompass an additional well. The remaining well driller report search area included the southeast quarter of section 4, the Northeast quarter of section 9, and the north half of the southeast quarter of section 9. Section 9 was also extended a little west to include an addition well that was close to the line of the area of review.

A total of 25 wells were found within the area of review. Where well use was listed, it was for domestic, most of which were listed as a single residence. There is a well in section 3 that was drilled in 1962 for irrigation supply.

Table 1: Result Summary from IDWR Find a Well Map in the Area of Review

Permit ID	Metal Tag #	Construction Date	Section	Quarter - Quarter	Production Rate (gpm)	Static Water Level (ft bgs)	Casing Diameter (in)	Casing Depth (ft)	Total Depth (ft)
Section 3 Wells									
780854	D0024649	7/16/2002	3	NESW	20	73	6	120	120
703039		7/6/1997	3	NESW	30	60	6	100	
895620	D0083626	8/30/2020	3	NESW	35	10	6	100	100
800174		5/31/1962	3	NESW		11	16	139	142
897398	D0084046	1/28/2021	3	NWSE	20	38	6	118	120
894735	D0081943	7/6/2020	3	NWSE	15	28	6	120	120
887264	D0075647	8/23/2018	3	NWSW		10	6	98	98
701985		8/21/1991	3	SESW	50	15	6		85
702847		5/13/1996	3	SESW	30	64	6	100	
702556		9/17/1994	3	SESW	35	15	6	60	
702232		4/28/1993	3	SWSW	50	105	6	152	
897773	D0084048	3/9/2021	3	SWSE	15	40	6	98	100
886148	D0075610	5/30/2018	3	SWSE		30	6	98	100
838116	D0037981	1/23/2006	3	SWSE	20	46	6	99	100
822910		3/14/1977	3	SWSW		23	6	60	60
702846		5/12/1996	3	SWSW	40	32	6	100	

Permit ID	Metal Tag #	Construction Date	Section	Quarter - Quarter	Production Rate (gpm)	Static Water Level (ft bgs)	Casing Diameter (in)	Casing Depth (ft)	Total Depth (ft)
Section 4 Wells									
770109	D0021196	7/19/2001	4	NESE		35	6	144	145
702566		10/5/1994	4	NESE	0	56	6	99	100
Section 9 Wells									
703513		10/5/1989	9	NENW	0	10	6	59	60
702246		4/7/1993	9	NESE	0	26	6	61	
894881	D0081998	7/16/2020	9	NWNE	47	2	6	78	80
808484	D0027575	10/29/2003	9	NWNE		20	6	100	100
833535		11/18/1962	9	SWNE		12	6	50	50
Section 10 Wells									
849279	D0048827	10/1/2007	10	NWNE		20	6	100	100
826174	D0035757	4/27/2005	10	SWSW		40	16	116	140

(Intentionally Left Blank)

SECTION 3 WELL SUMMARY

The wells in section 3 make up the majority of the wells within the area of review. There were 16 wells located in this section. All the lithologic logs have similar findings with most of them referring to clay, gravel, and sand throughout the depths. The shallowest static water level was 10 feet and the deepest was 105 feet.

SECTION 4 WELL SUMMARY

There are two wells located in section 4 and both have drilling logs associated with them. One log shows clayey gravel from the entire depth to 145 feet with water first encountered at 35 feet bags. The second log shows clay and rocks down to 56 feet, which is also where water was encountered. Then there is a transition to a mixture of clay, gravel, and sand down to a depth of 100 feet.

SECTION 9 WELL SUMMARY

Section 9 has five wells. All these wells have drilling logs, but one well that was constructed in 1962 has an illegible lithologic log. The shallowest level where water was first encountered was at 2 and the deepest was at 35 feet bags. All the drilling logs for these wells found a mix of clay and gravel throughout the log. Two of the logs also found some sand mixed in with the clay and gravel. Total well depths varied from 60 to 100 feet bags.

SECTION 10 WELL SUMMARY

Section 10 has two wells located in the area of review, one was drilled in 2005 and the other in 2007. One of the logs encountered mainly clay and gravel with some sand mixed in throughout the middle of the log. The other log encountered gravel and sand in the shallower depths and then started to encounter some larger gravels from 100 to 140 feet bags. One well had a static water level of 20 feet and the other was 40 feet.

OVERALL WELL LOG AND TOPOGRAPHY OBSERVATIONS



Figure 4: Topographic Map of Area Review

The general topography in the project site area is sloping down from east to west. The project site slopes at approximately 1%. The eastern side of the project property has an elevation of a little less than 6100 feet and the western end has an elevation ranging from about 6090 down to 6080 feet. Down gradient wells are located west of the project site, in the northeast portion of section 9.

The two legible well logs in NWNE show a mixture of clay, gravel, and sand. Depth to groundwater is relatively shallow, which one well having first encountered water at 2 and the other at 20 feet bags.

SOIL AND SURFACE GEOLOGIC CONDITIONS

The United States Department of Agriculture (USDA) Natural Resources Conservation District (NRCS) soil survey for the project area was utilized to supplement the information on soils in the area. A summary of site soils is presented below. The entire soil survey is included in Appendix C



Figure 5: Project Site Soil Survey Excerpt

Table 2: Soil Characteristic Summary

Soil Map Unit Number	Soil Group Name	Soil Description
13101	Redfish-Foxcreek complex, 0 to 2 percent slopes	Mucky peat on the surface underlain by loam progressing to extremely gravelly coarse sand. Soil Group C/D.
13113	Foxcreek mucky peat, 0 to 2 percent slopes	Mucky peat on the surface underlain by loam progressing to extremely gravelly coarse sand. Soil Group C/D.
13430	Alpine – St. Anthony complex, 0 to 2 percent slopes	Gravelly loams progressing to gravel. Well Drained. Soil Group B.
13431	Feltonia-Arimo complex 0 to 2 percent slopes	Loam, progressing to a very gravelly loamy sand. Well Drained. Soil Group B/C.

According to the area geologic map, the project is located in the East Teton Basin, which is influenced by Leigh Creek and Tributaries. The specific surface geology is a combine of Qafe1 and Qafe2. Qafe 1 which is the Alluvial fan 1 of East Teton Basin (late Pliocene). This is a gravel and silt mixture said to be formed by a large flood of Leigh Creek. Qafe2 was formed in the same manner and time as Qafe1. However, Qafe2 is stratified sand and gravel deposited above adjacent Qafe1 surfaces. Please see the excerpt below. The entire geologic map is included in Appendix C.

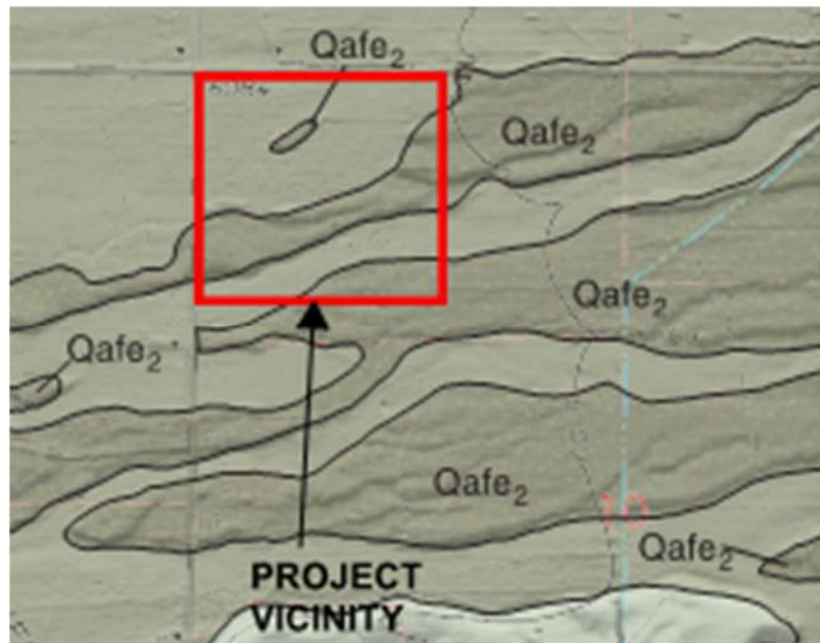


Figure 6: Surface Geology

BACKGROUND NITRATE CONCENTRATION

The Idaho Department of Environmental Quality (IDEQ) 2020 Nitrate Priority Area GIS server was used to determine nearby background nitrate concentrations. The figure below illustrates the nearby sample points. To the north, there are two sample points which are 0.27 and 0.73 mg/L. There are many sample points to the east of the project site, and they have a wide range of values, ranging from 0.18 to 3.44 mg/L Nitrate. The samples located south of the project site range from 1.44 to 3.12 mg/L of Nitrate. There is one sample point that is located southwest of the project site and it has the highest value of 7.87 mg/L.

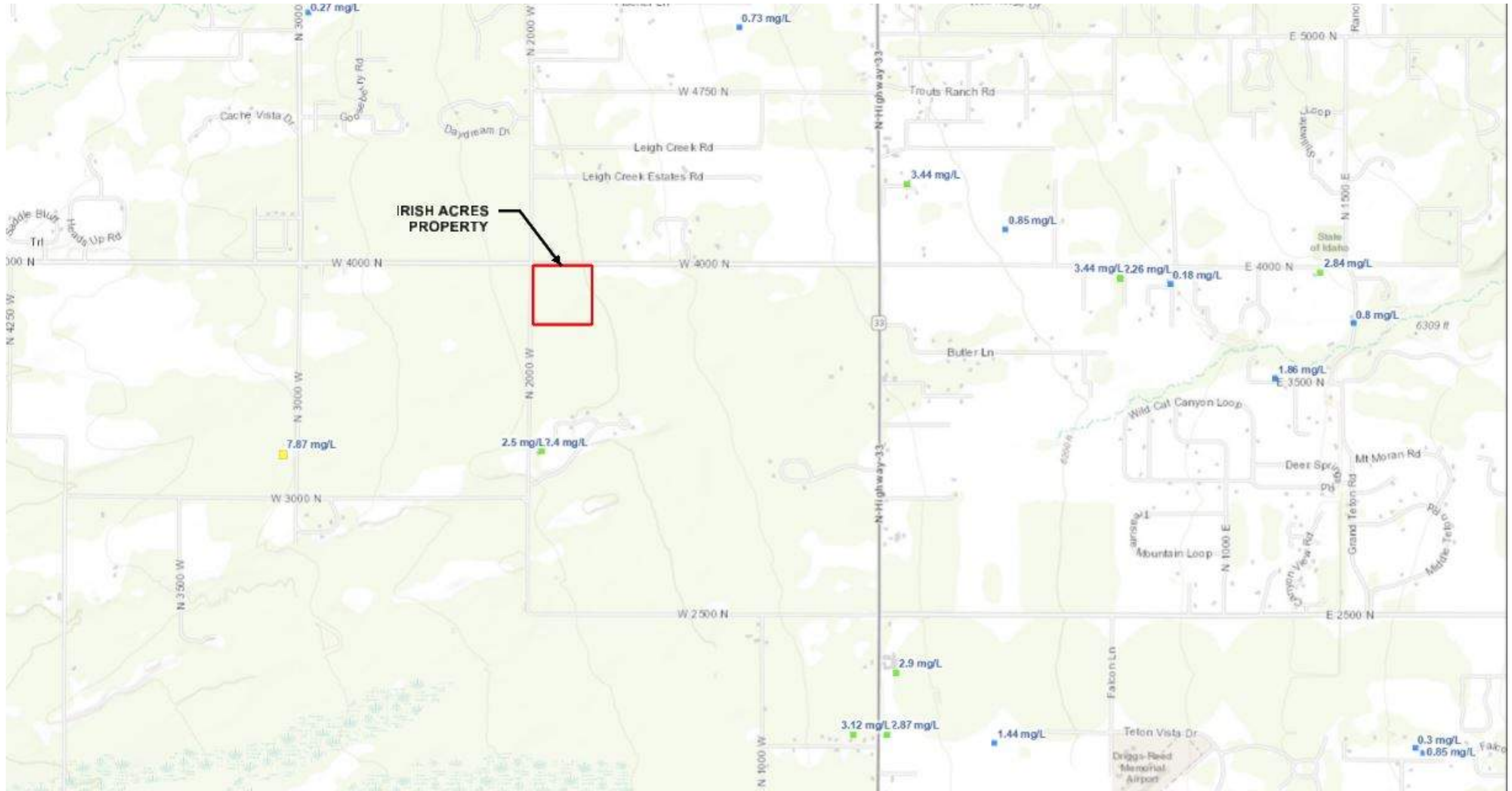











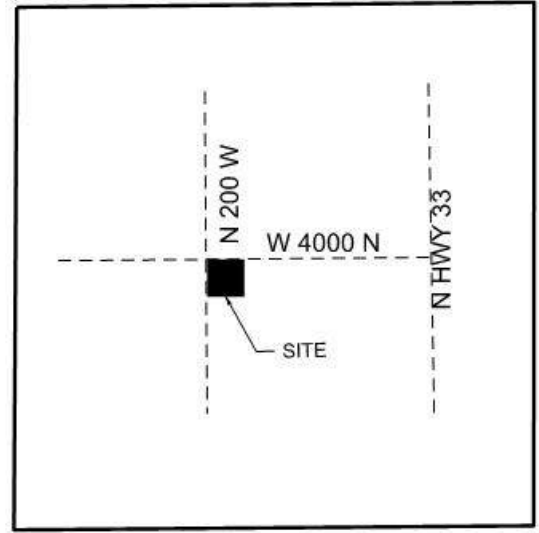
Figure 7: Nitrate Samples Near Project Vicinity

LEGEND

-  PROPERTY LINES
-  SETBACK LINE
-  SEPTIC SYSTEM COMPONENTS
-  SEPTIC TANK
-  BUILDING OUTLINE
-  WATER WELL
-  GRAVEL ROAD
-  MAJOR CONTOUR
-  MINOR CONTOUR


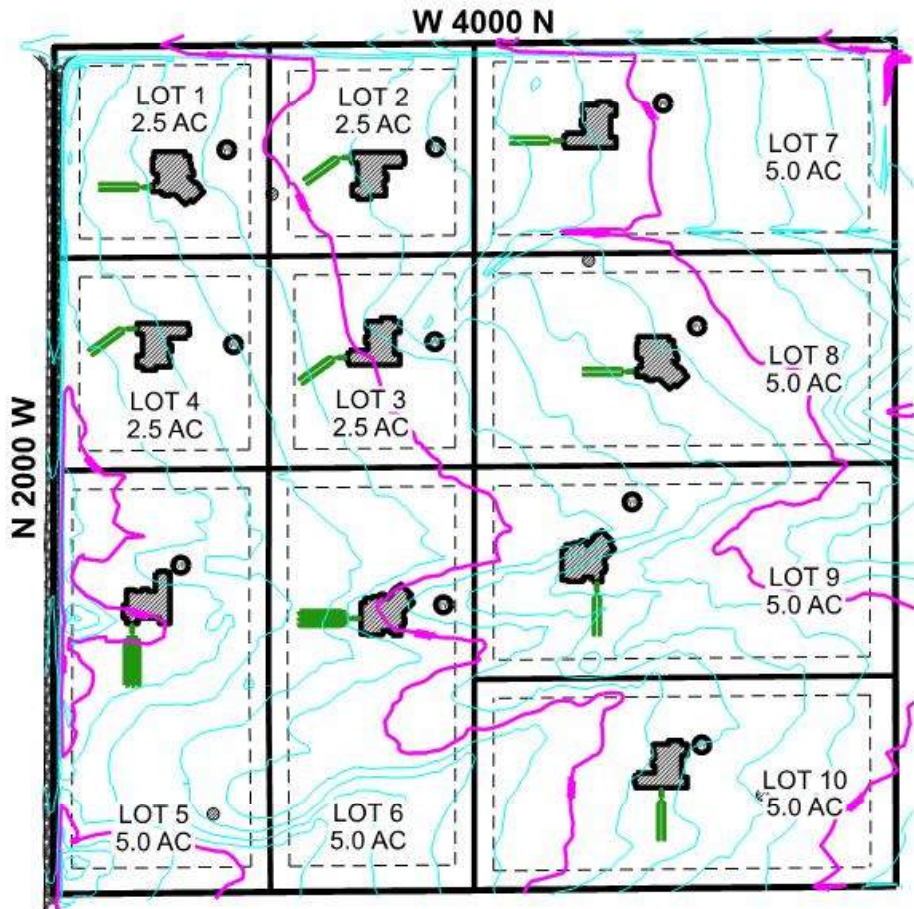
PERMIT ID 702846 & 822910 


PERMIT ID 702556, 701985 & 702847 

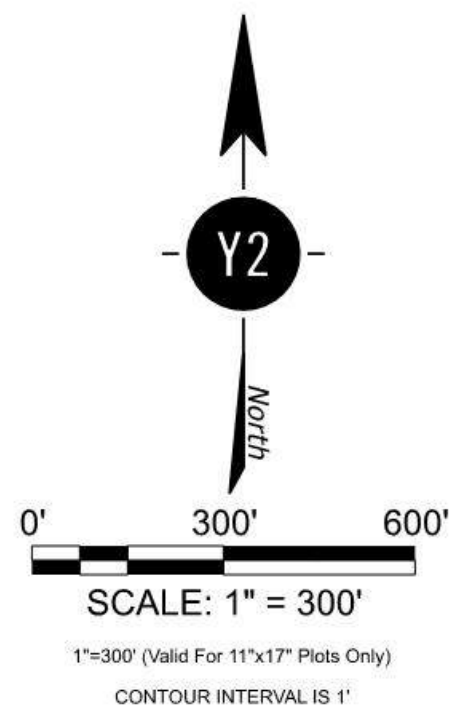


VICINITY MAP
(N.T.S.)

PERMIT ID 703513
THIS IS ACTUALLY MISLOCATED
AND IS TWO QUARTER QUARTERS
(2600 FEET) FURTHER WEST

D0048827 



DATE	DRAWING SET TITLE
6/28/2022	
DRAWN BY:	MMW
CHECKED BY:	JOB #:
	AL

Y2 CONSULTANTS
ENGINEERING, SURVEYING & PLANNING
LANDSCAPE ARCHITECTURE, GIS
NATURAL RESOURCE SERVICES

Y2consultants.com
307 733 2969

SITE PLAN
IRISH ACRES SUBDIVISION
SECTION 10, T5N, R45E BM
TETON COUNTY WYOMING

NITROGEN MASS BALANCE SPREADSHEET

The entire development as well as individual lot boundaries were assessed in the nitrogen mass balance spreadsheet to determine if the proposed systems would increase background concentrations of Nitrate by 1.0 mg/L or more. A summary of the input values is provided below. The individual mass balance sheets are included in Appendix D.

HYDRAULIC CONDUCTIVITY

The test pits, drilling logs, soil survey, and geology for the project site all demonstrate sand and gravel with some silts and clays at leach field and aquifer depths. A conservative hydraulic conductivity of 100 feet per day was used in the model. This conductivity is on the lower side of a sand and gravel aquifer.

HYDRAULIC GRADIENT

The hydraulic gradient was assumed to follow the natural topography of the site. Slope across the site goes from the east towards the west at about 1%. Therefore, the hydraulic gradient was assigned as 0.01 ft/ft.

MIXING ZONE THICKNESS

The default mixing zone thickness was used for all the lots.

LOT LAYOUT PARAMETERS

The site flows almost directly from east to west. The aquifer width perpendicular to flow was the measured distance from the northernmost to the southernmost leach field as laid out on the site plan. The distance is approximately 1,300 feet.

PARCEL IMPERVIOUSNESS

The average lot size is 4 acres. A relatively large house, outbuildings, and an access drive are assumed to use a maximum of 6,000 square feet for each lot. This results in an average imperviousness of 4%.

NATURAL RECHARGE RATE

The natural recharge rate was calculated as 1.65 inches per year from the natural recharge rate calculation in the spreadsheet. The average annual precipitation amount according to the Tetonia Experiment Station is 18.96 inches per year.

Accumulated Precipitation – TETONIA EXPERIMENT STN, ID

Use navigation tools above and below chart to change displayed range; green/black diamonds represent subsequent/missing values

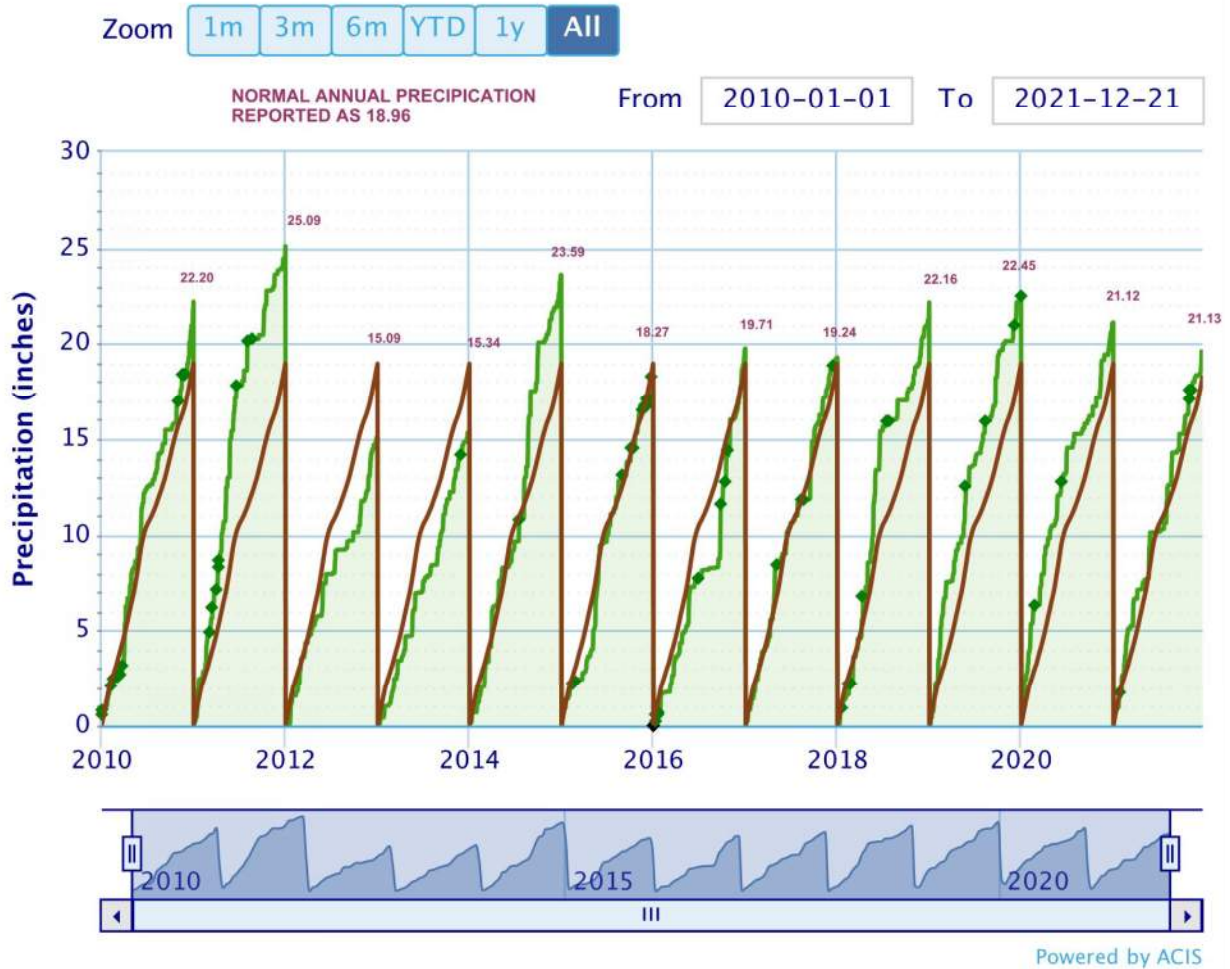


Figure 8: Annual Precipitation Information

BACKGROUND NITRATE CONCENTRATION

The background nitrate concentration of 3.4 mg/L was used from the data point south of the site from the IDEQ 2020 Nitrate Priority Area GIS server. This was the highest value from the upgradient sample points.

MASS BALANCE SPREADSHEET RESULTS

The summary of the downgradient nitrate concentration of each lot is shown in the table below.

Table 3: Nitrate Concentration Results

Lot #	Downgradient Nitrate Concentration (mg/L)	Less than 1 mg/L Nitrate Increase?
Entire Subdivision	4.1	Yes
1	3.7	Yes
2	3.7	Yes
3	3.6	Yes
4	3.6	Yes
5	3.5	Yes
6	3.5	Yes
7	3.7	Yes
8	3.6	Yes
9	3.6	Yes
10	3.7	Yes

CONCLUSION

The proposed layout of the Irish Acres Subdivision will not degrade groundwater. Our findings are that the soil is suitable for traditional septic systems as laid out in the letter from EIPH. In addition, the lots are large enough to provide adequate distance between wastewater and water systems to protect the health and safety of the future users of the subdivision and adjacent landowners.

REFERENCES

Idaho Department of Environmental Quality. July 14, 2021. 2020 Nitrate Priority Areas. <https://mapcase.deq.idaho.gov/npa/>.

Idaho Department of Water Resources. Find a Well Map. June 28, 2022. <https://idwr.idaho.gov/wells/find-a-well-map/>

National Oceanic and Atmospheric Administration. July 14, 2022. <https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USC00109065/detail>

Philips, William M., Glenn F. Embree, and Dean L. Garwood. Geologic Map of the Tetonia Quadrangle, Teton County, Idaho. 2013.

Teton County Code. Title 09 Subdivision Regulations. 2013.

Teton County Online Geographic Information System. July 15, 2022. <https://tetonidaho.maps.arcgis.com/apps/webappviewer/index.html?id=7cad88173b644a6a8e8c1147e94aa524>.

United States Department of Agriculture, Natural Resources Conservation District. Custom Soil Resource Report for Teton Area, Idaho and Cloud Veil, LLC 21094, Teton, ID. Downloaded June 23, 2021.

Appendix A: EIPH LETTER REPORT

06/29/2022

Teton County Planning and Zoning
89 North Main Suite 6
Driggs, Idaho 83422

Cloud Veil LLC
PO Box 1116
Wilson, WY 83014

Re: Irish Acres Subdivision

I have reviewed the application to have RP05N45E103300 subdivided into ten (10) lots to be known as Irish Acres Subdivision and determined the parcel and proposed lots are suitable for sub-surface waste disposal systems to serve residences.

Soil information observed has some minor variations across the parcel. Please see the detailed Test Hole Information page for more thorough soil description of each test hole. The following is a generalization of the soils observed in the 4 test holes.

Test hole one had slightly different make up of soils than did the other three. It consisted of very fine sand with minor silt content becoming more gravelly with depth with 25% rock content. This test pit was dug to 96 inches because this soil type allows drain field bottoms to be as close as four (4) feet to any impermeable or groundwater level. B1 to A2b soil type.

Test holes 2 through 4 consist mainly of very gravelly fine to medium to coarse sand with up to 50% rock content. All test holes were excavated to 120 inches. Rock content increases with depth but remains below 60% of content. A2A soil type.

No groundwater evidence was seen any test hole. No bedrock was encountered in any test hole.

Topography on the parcel varies in elevation. The southern portion of the property is lower by 3 to 5 feet than the north. There is surface undulation across entire parcel. This is not a concern for septic systems, but elevation should be kept in mind when septic systems are permitted as no portion of the drainfield can be deeper than four (4) feet from the natural grade.

The parcel has a very minor slope from the Northeast to the southwest. Areas to the south have been designated as agricultural wetlands due to flood irrigation practices. Once this irrigation is stopped there is no actual wetland. There are no hydric soils or wetland plants in evidence. There is a small area that appears to be a watering hole for livestock in the southwest corner of the parcel. Small irrigation ditches are apparent across the property.

Eastern Idaho Public Health gives preliminary approval of the application to divide RP05N45E103300 creating the Irish Acres Subdivision. The site is suitable for residential sub-surface waste disposal.

Individual subsurface sewage disposal systems may be allowed in accordance with IDAPA 58.01.03 and the Technical Guidance Manual for Individual Subsurface Waste Disposal. All current Idaho Rules must be met. Suitability criteria and required separation distances are to be maintained.

A copy of the final plat is to be provided to the Health District at the time the Health Certificate is signed. The application fee balance if any will also be collected prior to signing the Health Certificate. If this application /plan changes for any reason, please coordinate those changes in advance, with this office.



Kathleen Price
REHS/MSG
Eastern Idaho Public Health District
kprice@eiph.idaho.gov
208-354-2220

TEST HOLE INFORMATION

SUBDIVISION Trish Acres DATE June 2022

Test Hole # 1
 Location: SW corner / lot 6
 Depth: 96"

30" — Brown very fine sand little fine content. No rock content. B1

30" — gravelly fine sand 25% rock content 1-(3-4") Diameter rounded. B1 to A2b

96" — Dry / No Bedrock No GW evidence

Test Hole # 2
 Location: lot 10
 Depth: 120"

6" — ~~Black/Dark~~ gravelly silt loam

Very gravelly medium to coarse sand 35-40% Rock content A2A

120" — Rock content > @ Depth. No Groundwater or Bedrock.

Test Hole # 3
 Location: Lot 7/8 Border
 Depth: 120"

10" — ~~Dark sandy silt~~ minor gravel

Very gravelly fine to medium sand 40-50% Rock content 1-5" rounded clasts. A2A-

120" — Rock content > @ Depth - coarse sand. No Groundwater or Bedrock.

Test Hole # 4
 Location: Lot 1/2 Boundary
 Depth: 120"

Same as T.H. 3. A2A-

120" — Dry / No bedrock.

Test Hole # _____
 Location: _____
 Depth: _____

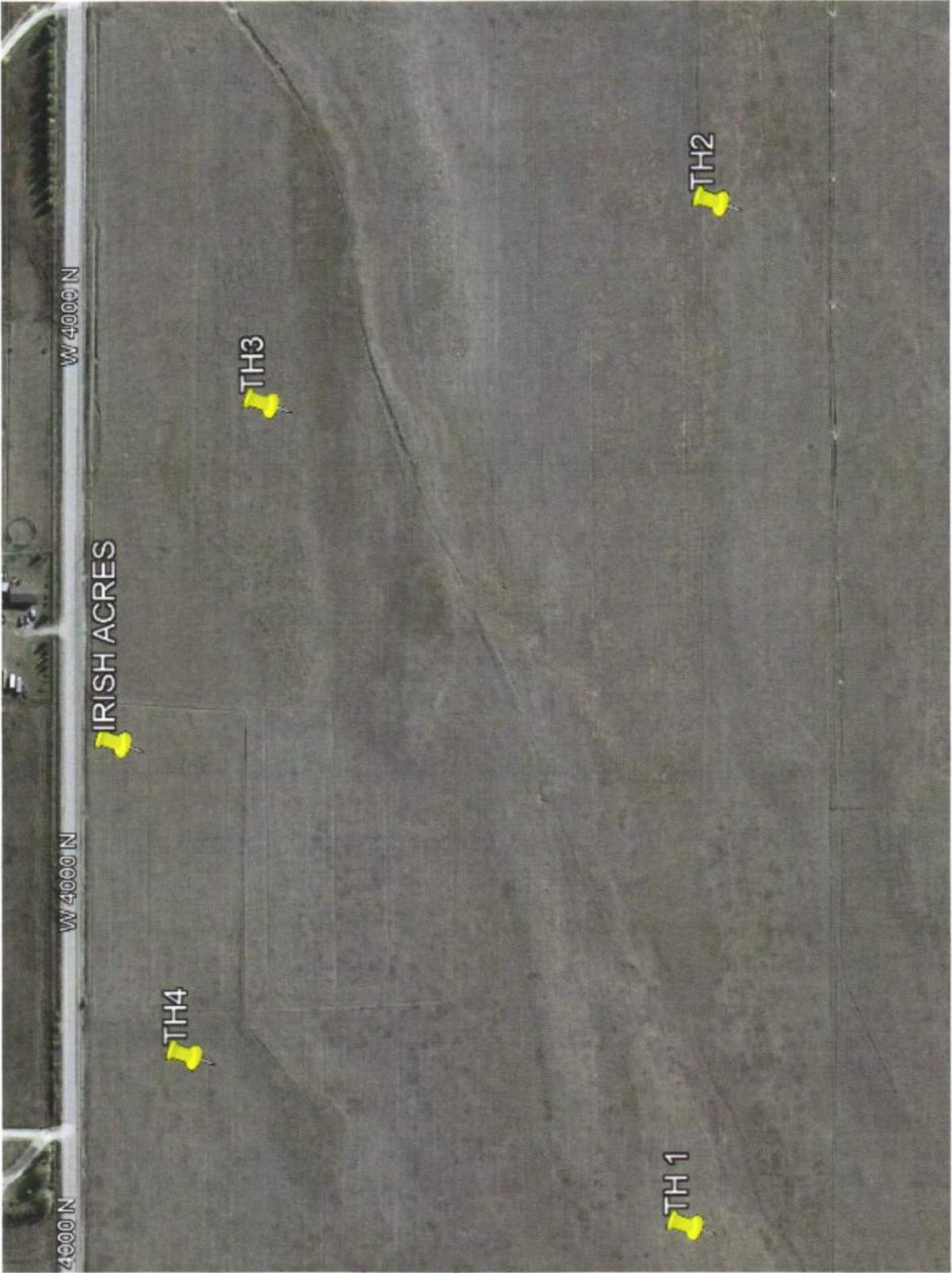
Size systems @ A2b if bottom of trench @ 48"

lot 6 size @ B1 if trench is shallow (24 to 30")

Minor to no slope -

Small well area near SW corner for watering livestock.

Test Hole # _____
 Location: _____
 Depth: _____

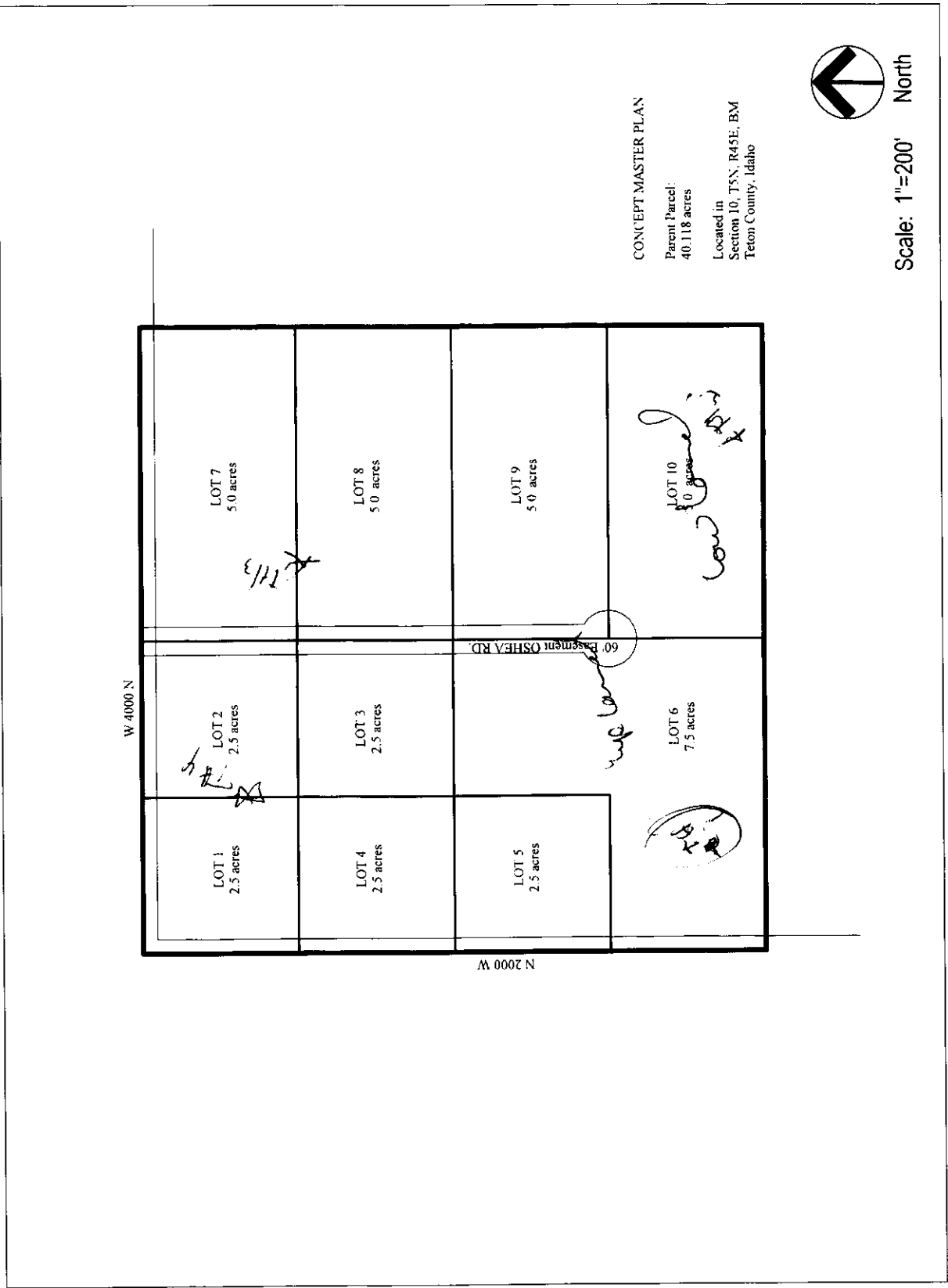


DATE: 01/11/13	BY: [Signature]
SCALE: 1"=200'	DATE: 01/11/13

SUBDIVISION APPLICATION
 IRISH ACRES SUBDIVISION APPLICATION
 40 acres within Sec. 10, Township 5 North, Range 45 East, B.M.
 Teton County IDAHO

PROJECT NO.	212004
DATE	01/11/13
BY	[Signature]
CHECKED	[Signature]
DATE	01/11/13
BY	[Signature]

CONCEPT MASTER PLAN
 SHEET
MAP 1



Appendix B: WELL DRILLER REPORTS

Form 238-11/97

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat: _____ Long: _____

1. WELL TAG NO. D 0024649
DRILLING PERMIT NO. 780854
Other IDWR No. _____

2. OWNER: River Bend Construction
Name _____
Address P.O. Box 588
City Victor State Id Zip 83455

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>5</u> North <input checked="" type="checkbox"/> or South <input type="checkbox"/>	
W		Rge. <u>45</u> East <input checked="" type="checkbox"/> or West <input type="checkbox"/>	
E		Sec. <u>3</u> NE 1/4 <u>SW</u> 1/4 _____ 1/4 _____	
S		Gov't Lot <u>2</u> County <u>Teton</u>	
		Lat: _____ Long: _____	
		Address of Well Site <u>475 N. 125 W.</u>	
		City <u>Tetonia</u>	

(Give at least name of road - Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

- Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

- New Well Modify Abandonment Other _____

6. DRILL METHOD

- Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK		AMOUNT		METHOD
Material	From	To	Sacks or Pounds	
<u>Bentone</u>	<u>0</u>	<u>20</u>	<u>300</u>	<u>outport</u>

Was drive shoe used? Y N Shoe Depth(s) _____
Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6"</u>	<u>72</u>	<u>120</u>	<u>30</u>	<u>STEEL</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations _____ Method _____
Screens _____ Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

73 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

- Pump Bailer Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>207</u>			<u>1 hr.</u>

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>3"</u>	<u>0</u>	<u>1</u>	<u>dirt</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>1</u>	<u>76</u>	<u>Gravel & Sand</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>76</u>	<u>111</u>	<u>Sand & Gravel</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>111</u>	<u>120</u>	<u>Gravel</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

RECEIVED

NOV 12 2002

Department of Water Resources
Eastern Region

Completed _____ Depth 120' (Measurable)
Date: Started 7-17-02 Completed 7/17/02

13. DRILLER'S CERTIFICATION

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

Company Name Teton Water Works S&P Firm No. _____

Firm Official Richie Staal Date 7-17-02

and Driller or Operator Greg Clark Date 7/17/02

(Sign once if Firm Official & Operator)

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

68043

Use Typewriter or Ballpoint Pen

Office Use Only
 Inspected by _____
 Twp _____ Rge _____ Sec _____
 1/4 _____ 1/4 _____ 1/4 _____
 Lat: : : Long: : :

1. DRILLING PERMIT NO. 22-99-E-0055-000

Other IDWR No. _____

Permit ID 703039

2. OWNER:

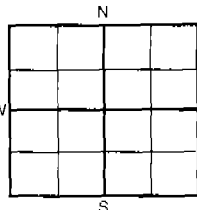
Name DAVE VANESSEN

Address HC 83

City Cascade State ID Zip 83611

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.



Twp. 5 North or South
 Rge. 45 East or West
 Sec. 3 NE 1/4 SW 1/4 1/4
 Gov't Lot _____ County Teton
 Lat: : : Long: : :

Address of Well Site _____

City DRIGGS

(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

- Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

- New Well Modify Abandonment Other _____

6. DRILL METHOD

- Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK		AMOUNT		METHOD
Material	From	To	Sacks or Pounds	
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>100</u>	<u>Overbore</u>

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

Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6" FOI</u>	<u>100</u>	<u>250</u>	<u>250</u>	<u>steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

- Perforations Method _____
 Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

60 ft. below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

- Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>30+</u>			<u>1 hr</u>

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encountered _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>6</u>	<u>0</u>	<u>6</u>	<u>Top Soil</u>		<input checked="" type="checkbox"/>
	<u>6</u>	<u>40</u>	<u>Sand & Gravel, some Clay</u>	<input checked="" type="checkbox"/>	
	<u>40</u>	<u>87</u>	<u>Clay & Gravel</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>87</u>	<u>90</u>	<u>Clay</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>90</u>	<u>100</u>	<u>Gravel</u>	<input checked="" type="checkbox"/>	

RECEIVED

JUL 30 1997

Department of Water Resources
 Eastern Region

RECEIVED

MICROFILMED

AUG 08 1997

OCT 15 1997

Department of Water Resources

Completed Depth 100 (Measurable)

Date: Started 7/7/97 Completed 7/7/97

13. DRILLER'S CERTIFICATION

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

Firm Name Teton Water Works LLC Firm No. 504

Firm Official [Signature] Date 7-8-97

and _____

Supervisor or Operator [Signature] Date 7/7/97

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D0083626

Drilling Permit No. _____
Water right or injection well # _____

2. OWNER: Scott Barlow

Name _____
Address 27614 Robillard Springs Ln.
City Katy State Tx Zip 77494

3. WELL LOCATION:
Twp. 5 North or South Rge. 45 East or West
Sec. 3 10 acres 1/4 40 acres NE 1/4 160 acres SW 1/4

Gov't Lot _____ County Teton
Lat. 43 ° 47.263 (Deg. and Decimal minutes)
Long. 111 ° 07.910 (Deg. and Decimal minutes)
Address of Well Site 1530 Leigh Creek Estates Rd
City Tetonia

(Give at least name of road + Distance to Road or Landmark)
Lot. _____ Blk. _____ Sub. Name _____

4. USE:
 Domestic Municipal Monitor Irrigation Thermal Injection
 Other _____

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>38</u>	<u>1100 LBS</u>	<u>10" temp casing</u>

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
<u>6</u>	<u>+1</u>	<u>100</u>	<u>250</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Was drive shoe used? Y N Shoe Depth(s) 100

9. PERFORATIONS/SCREENS:
Perforations Y N Method _____
Manufactured screen Y N Type _____
Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule

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

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) 10 Static water level (ft) 10
Water temp. (°F) _____ Bottom hole temp. (°F) _____
Describe access port _____

Well test: _____ Test method:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
	<u>35</u>	<u>20</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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>10</u>	<u>0</u>	<u>10</u>	<u>Clay & gravel</u>		<input checked="" type="checkbox"/>
<u>10</u>	<u>10</u>	<u>38</u>	<u>Clay & gravel</u>	<input checked="" type="checkbox"/>	
<u>6</u>	<u>38</u>	<u>100</u>	<u>Clay & gravel</u>	<input checked="" type="checkbox"/>	

RECEIVED
SEP 28 2020
Department of Water Resources
Eastern Region

Completed Depth (Measurable): 100'
Date Started: 8/31/20 Date Completed: 8/31/20

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: Daniel Danning Drilling Co. No. 518
*Principal Driller _____ Date _____
*Driller Brand By Date 9/1/20
*Operator II _____ Date _____
Operator I Brand Piquet Date 9/1/20

* Signature of Principal Driller and rig operator are required.

Permit ID 800174

Department of Reclamation

025222

WELL LOG AND REPORT OF THE STATE RECLAMATION ENGINEER OF IDAHO

Permit No. _____ Well No. 1 County Teton

Owner Earl Spencer

Idaho Falls, Idaho

Address _____

Driller R. P. Cope

Address 927 Poulsen Idaho Falls, Idaho

Well location S¹/₂ 1/4 N¹/₂ 1/4 Sec. 3, T. 5 N/S, R. 45 E/W

Size of drilled hole 16 inch

Total depth of well 142 ft.

Locate well in section

NW ¹ / ₄	NE ¹ / ₄
SW ¹ / ₄	SE ¹ / ₄

Give depth to standing water from the ground 11 ft. Water temp. _____ °Fahr.

On "Pumping Test" delivery was _____ g.p.m. or _____ c.f.s. Drawdown was _____ feet.

Size of pump and motor used to make test _____

Length of time of test _____ hours _____ minutes.

If flowing well, give flow _____ c.f.s. or _____ g.p.m. and of shut off pressure _____

If flowing well, described control works _____

(TYPE AND SIZE OF VALVE, ETC.)

Water will be used for Irrigation Weight of casing per lineal foot _____

Thickness of casing 1/4 in. Casing material Steel

(STEEL, CONCRETE, WOOD, ETC.)

Diameter, length and location of casing 139 ft. of 16" O.D.

(CASING 12" IN DIAMETER OR LESS, GIVE INSIDE DIAMETER; CASING OVER 12" IN DIAMETER, GIVE OUTSIDE DIAMETER)

CASING RECORD

Diam. Casing	From Feet	To Feet	Length	Remarks—seals, grouting, etc.

WSP

Number and size of perforations _____ located _____ feet to _____ feet from ground

Perforated 133 ft.

Date of commencement of well May 1962 Date of completion of well May 1962

SN - 4SE - 3 S¹/₂ N¹/₂

4585

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0084046

Drilling Permit No. _____
Water right or injection well # _____

2. OWNER: _____

Name Randy Dawson

Address PO Box 1535

City Driggs State ID Zip 83422

3. WELL LOCATION:

Twp. 5 North or South Rge. 45 East or West

Sec. 3 1/4 NW 1/4 SE 1/4

Gov't Lot _____ County teton

Lat. 43 47.160 (Deg. and Decimal minutes)

Long. 111 07.747 (Deg. and Decimal minutes)

Address of Well Site: 4283 Log Pines DR

City Tetonia

(Give at least name of road + Distance to Road or Landmark)

Lot. _____ Blk. _____ Sub. Name _____

4. USE:

Domestic Municipal Monitor Irrigation Thermal Injection
 Other _____

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
bentonite	0'	40'	1150 lbs	overbore

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
6"	+1	118'	.250	steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Was drive shoe used? Y N Shoe Depth(s) 118'

9. PERFORATIONS/SCREENS:

Perforations Y N Method _____

Manufactured screen Y N Type _____

Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule

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

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) 38' Static water level (ft) 38'

Water temp. (°F) 58* Bottom hole temp. (°F) 58*

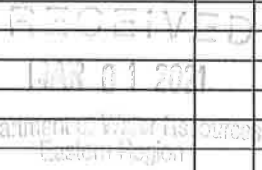
Describe access port _____

Well test:	Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Test method:			
				Pump	Baller	Air	Flowing artesian
110'	20	45	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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
10"	0'	44'	clay gravel	X	
6"	44'	120'	clay gravel	X	



Completed Depth (Measurable): 120'

Date Started: Jan 25, 2021 Date Completed: Jan 29, 2021

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 Denning Well Drilling Co. No. 702

*Principal Driller Steven Justin Farmer Date Feb 1, 2021

*Driller Steven Justin Farmer Date Feb 1, 2021

*Operator II _____ Date _____

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0081943

Drilling Permit No. _____

Water right or injection well # _____

2. OWNER:

Name Riverbend Builders

Address 2810 Wood bridge

City Idaho Falls State ID Zip 83402

3. WELL LOCATION:

Twp. 5 North or South Rge. 45 East or West

Sec. 3 1/4 NW 1/4 SE 1/4

Gov't Lot _____ County Teton

Lat. 43 ° 47.144 (Deg. and Decimal minutes)

Long. 111 ° 07.731 (Deg. and Decimal minutes)

Address of Well Site 1901 Leigh Creeks Estate

City Tetonia

Lot. _____ Blk. _____ Sub. Name _____

4. USE:

Domestic Municipal Monitor Irrigation Thermal Injection
 Other _____

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>40'</u>	<u>1100lbs</u>	<u>Temp Casting Overburden</u>

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
<u>6"</u>	<u>+2'</u>	<u>120'</u>	<u>.250</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Was drive shoe used? Y N Shoe Depth(s) 120'

9. PERFORATIONS/SCREENS:

Perforations Y N Method _____

Manufactured screen Y N Type _____

Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule

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

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) 38' Static water level (ft) 28'

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

Describe access port _____

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
<u>100'</u>	<u>15+gpm</u>	<u>60min</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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>10"</u>	<u>0</u>	<u>20'</u>	<u>topsoil, gravel</u>		<u>N</u>
	<u>20'</u>	<u>40'</u>	<u>gravel, sand</u>	<u>Y</u>	
<u>6"</u>	<u>40'</u>	<u>60'</u>	<u>gravel, clay</u>	<u>Y</u>	
	<u>60'</u>	<u>80'</u>	<u>gravel, clay</u>	<u>Y</u>	
	<u>80'</u>	<u>100'</u>	<u>clay, gravel</u>	<u>Y</u>	
	<u>100'</u>	<u>120'</u>	<u>gravel</u>	<u>Y</u>	

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AUG 13 2020
Department of Water Resources
Eastern Region

Completed Depth (Measurable): 120'
Date Started: 7/6/20 Date Completed: 7/7/20

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 Denning Drilling Co. No. 518

*Principal Driller Donald Denning Date 7-21-20

*Driller Ry Cook Date 7/8/20

*Operator II _____ Date _____

Operator I Riley Hill Date 7/8/20

* Signature of Principal Driller and rig operator are required.

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Don Dabel
Address Star Route Box 343 Wilson
Owner's Permit No. 22-91-E-087 Wyoming

7. WATER LEVEL

Static water level 15' feet below land surface.
Flowing? Yes No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: Valve Cap Plug
Temperature _____ °F. Quality _____
Describe artesian or temperature zones below.

2. NATURE OF WORK

New well Deepened Replacement
 Well diameter increase
 Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

8. WELL TEST DATA

Pump Bailer Air Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
<u>50</u>		

3. PROPOSED USE

Domestic Irrigation Test Municipal
 Industrial Stock Waste Disposal or Injection
 Other _____ (specify type)

9. LITHOLOGIC LOG

Bore Diam.	Depth		Material	Water	
	From	To		Yes	No
6"	0	56	Sand + Gravel		<input checked="" type="checkbox"/>
	56	59	Gravel + Brown clay	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	59	85	Sand + Gravel	<input checked="" type="checkbox"/>	

4. METHOD DRILLED

Rotary Air Hydraulic Reverse rotary
 Cable Dug Other _____

5. WELL CONSTRUCTION

Casing schedule: Steel Concrete Other _____
Thickness 0.250 inches Diameter 6" inches From _____ feet To _____ feet
Was casing drive shoe used? Yes No
Was a packer or seal used? Yes No
Perforated? Yes No
How perforated? Factory Knife Torch Gun
Size of perforation _____ inches by _____ inches
Number _____ From _____ To _____
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
Well screen installed? Yes No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? Yes No Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 18' Material used in seal: Cement grout
 Bentonite Puddling clay _____
Sealing procedure used: Slurry pit Temp. surface casing
 Overbore to seal depth
Method of joining casing: Threaded Welded Solvent
Weld
 Cemented between strata
Describe access port _____

10. Work started 8/21/91 finished 8/21/91

6. LOCATION OF WELL

Sketch map location must agree with written location.
Subdivision Name WILSON
MAY 05 1992
Lot No. _____ Block No. _____
County Teton
SE ¼ SW ¼ Sec. 3, T. 5 N. 45 E. X
S R. 45 W

11. DRILLERS CERTIFICATION

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

Firm Name Independent Drilling Firm No. 343
Address 664 W. 200 N. Bluff Date 8/26/91
Signed by (Firm Official) Brent Hendrick
and
(Operator) Kip L. Rahmug

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT 093649

Permit ID 702847

Use Typewriter or Ballpoint Pen

Office Use Only			
Inspected by _____			
Twp	Rge	Sec	
1/4	1/4	1/4	
Lat: _____		Long: _____	

1. DRILLING PERMIT NO. 22-96-E-0037-000

Other IDWR No. _____

2. OWNER:

Name Todd or Cindy Friend
Address P.O. Box 590
City Driggs State ID Zip 83422

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N			
S			

Twp. 5 North or South
Rge. 45 East or West
Sec. 3 SE SW 1/4 1/4
Gov't Lot _____ County Teton
Lat: _____ Long: _____

Address of Well Site _____

(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Bk. _____ Sub. Name _____

4. USE:

- Domestic Municipal Monitor Irrigation
- Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

- New Well Modify Abandonment Other _____

6. DRILL METHOD

- Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Sacks or Pounds		
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>200</u>	<u>over Base</u>	

Was drive shoe used? Y N Shoe Depth(s) _____
Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6 + 2</u>	<u>100</u>	<u>250</u>	<u>250</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

- Perforations Method None
- Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

64 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

- Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>30</u>	<u>100</u>	<u>100</u>	<u>2 Hrs</u>

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: excellent
Depth first Water Encountered 80'

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>6</u>	<u>0</u>	<u>14</u>	<u>Top Soil</u>		<input checked="" type="checkbox"/>
	<u>14</u>	<u>21</u>	<u>clay + gravel</u>		<input checked="" type="checkbox"/>
	<u>21</u>	<u>27</u>	<u>large Black Rock + clay</u>		<input checked="" type="checkbox"/>
	<u>27</u>	<u>40</u>	<u>hard gravel + clay</u>		<input checked="" type="checkbox"/>
	<u>40</u>	<u>55</u>	<u>small gravel + clay</u>		<input checked="" type="checkbox"/>
	<u>55</u>	<u>80</u>	<u>clay</u>	<input checked="" type="checkbox"/>	
<u>6</u>	<u>80</u>	<u>100</u>	<u>clay + small gravel</u>	<input checked="" type="checkbox"/>	

RECEIVED
MAY 17 1996

Department of Water Resources
Eastern District Office

AUG 21 1996

Completed Depth 100' (Measurable)
Date Started 5-14-96 Completed 5-14-96

13. DRILLER'S CERTIFICATION

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

Firm Name Teton Water Works LP Firm No. 506

Firm Official [Signature] Date 5-15-96

Supervisor or Operator [Signature] Date 5-15-96

(Sign once if Firm Official & Operator)

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter
or
Ball Point Pen

55899

1. DRILLING PERMIT NO. 22-94-E-167
Other IDWR No. _____

2. OWNER:
Name Kent Hale
Address P.O. Box 117
City Tetonia State Id Zip 83452

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>5</u> North <input checked="" type="checkbox"/> or South <input type="checkbox"/>	
E		Rge. <u>15</u> East <input checked="" type="checkbox"/> or West <input type="checkbox"/>	
S		Sec. <u>3</u> SE 1/4 <input checked="" type="checkbox"/> SW 1/4 <input type="checkbox"/>	
W		Gov't Lot _____ County <u>TETON</u>	

Address of Well Site 178 W. 400 N
Pucksaddle Rd. City Tetonia
(Give at least name of road + Distance to Road or Landmark)

4. PROPOSED USE:

- Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK

- New Well Modify or Repair Replacement Abandonment

6. DRILL METHOD

- Mud Rotary Air Rotary Cable Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>3</u>	<u>Over bore</u>

Was drive shoe used? Y N

Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6</u>	<u>0</u>	<u>60</u>	<u>250</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS NONE

- Perforations Method _____
 Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

15 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

- Pump Bailer Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>35</u>	<u>55</u>	<u>85</u>	<u>1 Hr</u>

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: Clean + good

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>6</u>	<u>0</u>	<u>20</u>	<u>sand + gravel (12' H₂O)</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>6</u>	<u>2</u>	<u>30</u>	<u>sand</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>6</u>	<u>30</u>	<u>40</u>	<u>washed gravel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>6</u>	<u>40</u>	<u>60</u>	<u>sand + gravel</u>	<input type="checkbox"/>	<input type="checkbox"/>

RECEIVED DEC 23 1994
RECEIVED DEC 14 1994
RECEIVED OCT 14 1994
MAY 08 1995

Completed Depth 60' (Measurable)
Date: Started 9-18-94 Completed 9-18-94

13. DRILLER'S CERTIFICATION

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

Firm Name Teton Water Works Firm No. 506

Firm Official _____ Date 10-12-94

and Supervisor or Operator [Signature] Date _____

(Sign once if Firm Official & Operator)

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department
within 30 days after the completion or abandonment of the

Location Corrected by IDWR To:

T05N R45E Sec. 3 NESWSW

By: mciscell 2012-12-13

1. WELL OWNER

Name Monte Whittier
Address P.O. Box 4833 Pocatello, Id
Drilling Permit No. 22-93E-023-000
Water Right Permit No. A22-02161F A22-02151F

7. WATER LEVEL

Static water level 105 feet below land surface.
Flowing? Yes No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: Valve Cap Plug
Temperature _____ °F. Quality _____
Describe artesian or temperature zones below.

2. NATURE OF WORK

New well Deepened Replacement
 Well diameter increase Modification
 Abandoned (describe abandonment or modification procedures
such as liners, screen, materials, plug depths, etc. in lithologic
log, section 9.)

8. WELL TEST DATA

Pump Bailer Air Other _____
Discharge G.P.M. 50 Pumping Level _____ Hours Pumped 3

3. PROPOSED USE

Domestic Irrigation Monitor
 Industrial Stock Waste Disposal or Injection
 Other _____ (specify type)

9. LITHOLOGIC LOG

107138

Bore Diam.	Depth		Material	Water	
	From	To		Yes	No
	0	30	dirty clay mixed w/ gravel		X
	30	46	real fine sand mixed w/ clay		X
	46	56	dirty water, gravel, sand	X	
	56	108	clay w/ 1/2" to 2' gravel mixed w/ gravel		X
	108	150	water w/ gravel + fine sand kept going	X	
	150	152	gravel - good flow	X	

4. METHOD DRILLED

Rotary Air Auger Reverse rotary
 Cable Mud Other _____
(backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION

Casing schedule: Steel Concrete Other _____
Thickness Diameter From To
250 inches 6 inches + 0 feet 162 feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
Was casing drive shoe used? Yes No
Was a packer or seal used? Yes No
Perforated? Yes No
How perforated? Factory Knife Torch Gun
Size of perforation? _____ inches by _____ inches
Number From To
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
Well screen installed? Yes No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? Yes No Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 20 Material used in seal: Cement grout
 Bentonite Puddling clay _____
Sealing procedure used: Slurry pit
 Temp. surface casing Overbore to seal depth
Method of joining casing: Threaded Welded
 Solvent Weld Cemented between strata
Describe access port _____

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MAY 20 1993

Department of Water Resources
Eastern District Office

FEB 09 1994

6. LOCATION OF WELL

Sketch map location must agree with written location.
Subdivision Name _____
Lot No. _____ Block No. _____
County _____
Address of Well Site Packsaddle road
(give at least name of road)
SW 1/4 NW 1/4 Sec. 3 T. 50 N or S
R. 45 E or W

10.

Work started 3-30-93 finished 4-29-93

11. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were
complied with at the time the rig was removed.
Firm Name Teton Water Firm No. 506
Address Idaho Falls, Id Date 5-18-93
Signed by Drilling Supervisor [Signature]
and
(Operator) _____
(If different than the Drilling Supervisor)

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 00751010

Drilling Permit No. _____

Water right or injection well # _____

2. OWNER: Darren Enrico

Name _____

Address 548 Cobblecrest Rd.

City Driggs State ID Zip 83422

3. WELL LOCATION:

Twp. 5 North or South Rge. 46 East or West

Sec. 3 _____ 1/4 SW 1/4 SE 1/4 _____

Gov't Lot _____ County Teton

Lat. 43 ° 47.023 (Deg. and Decimal minutes)

Long. 111 ° 7.610 (Deg. and Decimal minutes)

Address of Well Site 4183 Los Pinos Dr.

City Teton

(Give at least name of road + Distance to Road or Landmark)

Lot. _____ Blk. _____ Sub. Name _____

4. USE:

Domestic Municipal Monitor Irrigation Thermal Injection

Other _____

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>41'</u>	<u>20 Bags</u>	<u>over bore</u>

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
<u>6"</u>	<u>+2</u>	<u>98'</u>	<u>.230"</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

9. PERFORATIONS/SCREENS:

Perforations Y N Method _____

Manufactured screen Y N Type _____

Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule

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

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) 30' Static water level (ft) 30'

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

Describe access port _____

Well test: _____ Test method:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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>6"</u>	<u>0</u>	<u>40'</u>	<u>Clay Gravel</u>		<u>K</u>
<u>6"</u>	<u>40</u>	<u>65'</u>	<u>Clay Gravel</u>	<u>K</u>	
<u>6"</u>	<u>65'</u>	<u>68'</u>	<u>Clay</u>		<u>K</u>
<u>6"</u>	<u>68</u>	<u>100'</u>	<u>Clay & Gravel</u>	<u>K</u>	

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AUG 13 2018

Department of Water Resources
Eastern Region

Completed Depth (Measurable): 98'

Date Started: 5-30-18 Date Completed: 5-31-18

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 Denning Drilling Co. No. 518

*Principal Driller Daniel Denning Date 6-12-18

*Driller Daniel Denning Date 6-12-18

*Operator II _____ Date _____

Operator I Phil Cook Date 6/12/18

* Signature of Principal Driller and rig operator are required.

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
 Well ID No. _____
 Inspected by _____
 Twp _____ Rge _____ Sec _____
 _____ 1/4 _____ 1/4 _____ 1/4
 Lat: : : Long: : :

22

1. WELL TAG NO. D 0037951
 DRILLING PERMIT NO. _____
 Water Right or Injection Well No. _____

2. OWNER:
 Name Brad R. Nelson
 Address P.O. Box 187
 City Letonia State Id Zip 83452

3. LOCATION OF WELL by legal description:
 You must provide address or Lot, Blk, Sub. or Directions to well.
 Twp. 5 North or South
 Rge. 45 East or West
 Sec. 3 1/4 SW 1/4 SE 1/4
 Gov'l Lot _____ County Letonia
 Lat: : : Long: _____
 Address of Well Site Loc 1 Lospinos Sub P.U.
 City _____
 Lt. 1 Blk. _____ Sub. Name Lospinos

4. USE:
 Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
 New Well Modify Abandonment Other _____

6. DRILL METHOD:
 Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>450</u>	<u>COUPLER</u>

Was drive shoe used? Y N Shoe Depth(s) 99'
 Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6</u>	<u>+1</u>	<u>99</u>	<u>252</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____
 Packer Y N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE
 Perforation Method _____
 Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
46 ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:
 Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>207</u>	<u>450 @ 250</u>	<u>762</u>	

Water Temp. 100 Bottom hole temp 100
 Water Quality test or comments: _____
 Depth first Water Encounter 66'

13. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>8</u>	<u>0</u>	<u>20</u>	<u>Sand & gravel</u>		<input checked="" type="checkbox"/>
<u>6</u>	<u>20</u>	<u>70</u>	<u>CLAY & GRAVEL</u>		
<u>1</u>	<u>70</u>	<u>80</u>	<u>Brown CLAY</u>		
<u>1</u>	<u>80</u>	<u>100</u>	<u>CLAY & GRAVEL</u>		

RECEIVED
 JAN 26 2006
 Department of Water Resources
 Eastern Region

Completed Depth 100' (Measurable)
 Date: Started 1-19-06 Completed 1-24-06

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 MARK MACHILL WELDR Firm No. 612
 Principal Driller [Signature] Date 1-24-06
 and Driller or Operator II _____ Date _____
 Operator I _____ Date _____

Principal Driller and Rig Operator Required.
 Operator I must have signature of Driller/Operator II.

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

Office Use Only
 Inspected by _____
 Twp _____ Rge _____ Sec _____
 _____ 1/4 _____ 1/4 _____ 1/4
 Lat: _____ : _____ Long: _____ : _____

1. WELL TAG NO. D 0021196
 DRILLING PERMIT NO. 7-70109
 Other IDWR No. _____

2. OWNER:
 Name Harold Robinson
 Address 140 2 5th East
 City DRiggs State ID Zip 83422

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

Twp. 5 North or South
 Rge. 45 East or West
 Sec. 4 1/4 NE 1/4 SE 1/4
 Gov't Lot _____ County Teton
 Lat: _____ Long: _____
 Address of Well Site Hwy 33
 City DRiggs

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
 Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
 New Well Modify Abandonment Other _____

6. DRILL METHOD
 Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK		AMOUNT		METHOD
Material	From	To	Sacks or Pounds	
<u>Bentonite</u>	<u>0</u>	<u>20'</u>	<u>250 LBS</u>	<u>OVER BORE</u>

Was drive shoe used? Y N Shoe Depth(s) _____
 Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6"</u>	<u>+1</u>	<u>144'</u>	<u>250"</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations _____ Method _____
 Screens _____ Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

35 ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>8"</u>	<u>0'</u>	<u>20'</u>	<u>Clay Gravel</u>		<input checked="" type="checkbox"/>
<u>6"</u>	<u>20'</u>	<u>35'</u>	<u>Clay Gravel</u>		<input checked="" type="checkbox"/>
<u>6"</u>	<u>35'</u>	<u>145'</u>	<u>Clay Gravel</u>	<input checked="" type="checkbox"/>	

RECEIVED

JUL 27 2001

Department of Water Resources
Eastern Region

RECEIVED

AUG -9 2001

Department of Water Resources

Completed Depth 145' (Measurable)
 Date: Started 7-20-01 Completed 7-20-01

13. DRILLER'S CERTIFICATION

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

Company Name Denning Drilling Firm No. 518

Firm Official Clayton Denning Date 7-20-01

and Driller or Operator _____ Date _____

(Sign once if Firm Official & Operator)

DMP

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only			
Well ID No.	_____		
Inspected by	_____		
Twp	Rge	Sec	
_____	_____	_____	
Lat: _____	: _____	Long: _____	: _____

1. **WELL TAG NO. D** 0027575
 DRILLING PERMIT NO. _____
 Water Right or Injection Well No. 22

2. **OWNER:**
 Name Harold Gee
 Address 2272 E Hwy 33
 City Sugar City State ID Zip 83448

3. **LOCATION OF WELL by legal description:**
 You must provide address or Lot, Blk, Sub. or Directions to well.
 Twp. S North or South
 Rge. 45 East or West
 Sec. 9 1/4 NW 1/4 NE 1/4
 Gov't Lot _____ County Teton
 Lat: _____ Long: _____
 Address of Well Site 375 N 300W
 City Driggs
 Lt. _____ Blk _____ Sub. Name _____

4. **USE:**
 Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. **TYPE OF WORK** check all that apply (Replacement etc.)
 New Well Modify Abandonment Other _____

6. **DRILL METHOD:**
 Air Rotary Cable Mud Rotary Other _____

7. **SEALING PROCEDURES**

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>400 #</u>	<u>overbore</u>

Was drive shoe used? Y N Shoe Depth(s) _____
 Was drive shoe seal tested? Y N How? _____

8. **CASING/LINER:**

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6"</u>	<u>+</u>	<u>100</u>	<u>250</u>	<u>Steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____
 Packer Y N Type _____

9. **PERFORATIONS/SCREENS PACKER TYPE**

Perforation Method _____
 Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. **FILTER PACK**

Filter Material	From	To	Weight / Volume	Placement Method

11. **STATIC WATER LEVEL OR ARTESIAN PRESSURE:**
20' ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____

12. **WELL TESTS:**
 Pump Bailer Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
 Water Quality test or comments: _____

13. **LITHOLOGIC LOG: (Describe repairs or abandonment)**

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>6"</u>	<u>0'</u>	<u>20'</u>	<u>Dirt, clay, gravel</u>		<input checked="" type="checkbox"/>
<u>6"</u>	<u>20'</u>	<u>68'</u>	<u>clay gravel</u>	<input checked="" type="checkbox"/>	
<u>6"</u>	<u>68'</u>	<u>90'</u>	<u>clay sand gravel</u>	<input checked="" type="checkbox"/>	
<u>6"</u>	<u>90'</u>	<u>100'</u>	<u>clay gravel</u>	<input checked="" type="checkbox"/>	

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 DEC 08 2003
 Department of Water Resources
 Eastern Region

Completed Depth 100' (Measurable)
 Date: Started 10/28/03 Completed 10/30/03

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 Denning Well Drilling Firm No. 518
 Principal Driller James Denning Date 11-3-03
 and
 Driller or Operator II James Denning Date 10/30/03
 Operator I _____ Date _____

Principal Driller and Rig Operator Required
 Operator I must have signature of Driller/Operator II.

Permit ID 833535

RECEIVED
DEC 21 1962

WELL LOG AND REPORT OF THE 026859 STATE RECLAMATION ENGINEER OF IDAHO

Permit No. _____ Well No. _____ County Latah

Owner Ray Hanes

Address Idonia

Driller Walter Harris

Address Highway Idaho

Well location 5 1/2 mile 1/4 NE 1/4 Sec. 9, T. 5 N 1/2 R. 45 E 1/4

Size of drilled hole 6"

Total depth of well 50'

Locate well in section

NW 1/4	NE 1/4
SW 1/4	SE 1/4

Give depth to standing water from the ground 12" Water temp. _____ °Fahr.

On "Pumping Test" delivery was _____ g.p.m. or _____ c.f.s. Drawdown was _____ feet.

Size of pump and motor used to make test _____

Length of time of test _____ hours _____ minutes.

If flowing well, give flow _____ c.f.s. or _____ g.p.m. and of shut off pressure _____

If flowing well, described control works _____

(TYPE AND SIZE OF VALVE, ETC.)

Water will be used for Domestic Weight of casing per lineal foot _____

Thickness of casing _____ Casing material steel
(STEEL, CONCRETE, WOOD, ETC.)

Diameter, length and location of casing 6" 50' to 50'
(CASING 12" IN DIAMETER OR LESS, GIVE INSIDE DIAMETER;
CASING OVER 12" IN DIAMETER, GIVE OUTSIDE DIAMETER)

CASING RECORD

Diam. Casing	From Feet	To Feet	Length	Remarks—seals, grouting, etc.
<u>6"</u>	<u>1</u>	<u>50</u>	<u>50'</u>	

Number and size of perforations _____ located _____ feet to _____ feet from ground

Date of commencement of well Nov 17-62 Date of completion of well Nov 19-62

5N-45E-9 5 1/2 NE 4587

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

22

Office Use Only			
Well ID No.	_____		
Inspected by	_____		
Twp	Rge	Sec	
1/4	1/4	1/4	
Lat: : :	Long: : :		

1. WELL TAG NO. D 0048827
DRILLING PERMIT NO. _____
Water Right or Injection Well No. _____

2. OWNER:
Name Shawn Perkins
Address 307 North Hwy 33
City Driggs State ID Zip 83455

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North or South
Rge. 45 East or West
Sec. 10 1/4 NW 1/4 NE 1/4
Gov't Lot _____ County Teton
Lat: 43:46:869 Long: 111:07:899
Address of Well Site 400 N. 95 West
City Driggs
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
 Domestic Municipal Monitor Irrigation
 Thermal Injection Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
 New Well Modify Abandonment Other _____

6. DRILL METHOD:
 Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>benzite</u>	<u>0'</u>	<u>18'</u>	<u>450 lbs</u>	<u>overbore</u>

Was drive shoe used? Y N Shoe Depth(s) 100'
Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6"</u>	<u>0'</u>	<u>100'</u>	<u>290</u>	<u>steel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____
Packer Y N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____
Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						<input type="checkbox"/>	<input type="checkbox"/>

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
20 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:
 Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>8"</u>	<u>0'</u>	<u>18'</u>	<u>clay-gravels</u>		<input checked="" type="checkbox"/>
<u>6"</u>	<u>18'</u>	<u>45'</u>	<u>clay-gravels</u>	<input checked="" type="checkbox"/>	
<u>6"</u>	<u>45'</u>	<u>60'</u>	<u>clay-sand-gravels</u>	<input checked="" type="checkbox"/>	
<u>6"</u>	<u>60'</u>	<u>80'</u>	<u>clay-sand-gravels</u>	<input checked="" type="checkbox"/>	
<u>6"</u>	<u>80'</u>	<u>100'</u>	<u>clay-gravels</u>	<input checked="" type="checkbox"/>	

Completed Depth 100' (Measurable)
Date: Started 10-2-07 Completed 10-2-07

RECEIVED
OCT 11 2007
Department of Water Resources
Eastern Region

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 Deming Drilling Firm No. 518
Principal Driller Armed Deming Date 10-3-07
and
Driller or Operator II Armed Deming Date 10-3-07
Operator I John Deming Date 10-5-07
Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

DWO

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

22

Office Use Only			
Well ID No.	_____		
Inspected by	_____		
Twp _____	Rge _____	Sec _____	
1/4 _____		1/4 _____	1/4 _____
Lat: _____	: _____	Long: _____	: _____

1. WELL TAG NO. D 0035757
 DRILLING PERMIT NO. _____
 Water Right or Injection Well No. _____

2. OWNER:
 Name Highland Meadows LLC
 Address PO BOX 408
 City Driggs State ID Zip 83422

3. LOCATION OF WELL by legal description:
 You must provide address or Lot, Blk, Sub. or Directions to well.
 Twp. 5N North or South
 Rge. 45E East or West
 Sec. 10 1/4 SW 1/4 SW 1/4
 Gov't Lot _____ To acres _____ County Teton
 Lat: _____ Long: _____
 Address of Well Site _____

(Give at least name of road + Distance to Road or Landmark)
 Lt. _____ Blk. _____ Sub. Name Highland Meadows Subdivision

4. USE:
 Domestic Municipal Monitor Irrigation
 Thermal Injection Other Subdivision - Domestic

5. TYPE OF WORK check all that apply (Replacement etc.)
 New Well Modify Abandonment Other _____

6. DRILL METHOD:
 Air Rotary Cable Mud Rotary Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
NEAT Cement	0'	60'	3 1/2 yds	over Bore

Was drive shoe used? Y N Shoe Depth(s) 140'
 Was drive shoe seal tested? Y N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
16"	#1	60'	.50	Steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12"	#1	116'	.322	Steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Length of Headpipe _____ Length of Tailpipe _____
 Packer Y N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method Johanson Wirewrap (Stainless)
 Screen Type & Method of Installation Forward w/ Packer

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
116'	140'	.080"	Tele	12"	Stainless	<input type="checkbox"/>	<input type="checkbox"/>

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
35' ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:

Pump Bailor Air Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
 Water Quality test or comments: _____
 Depth first Water Encounter 40'

13. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
16"	0'	20'	Gravels, Sand		<input checked="" type="checkbox"/>
16"	20'	40'	Gravels, Sand	<input checked="" type="checkbox"/>	
16"	40'	50'	13clones, Gravel	<input checked="" type="checkbox"/>	
16"	50'	60'	Gravels (Small)	<input checked="" type="checkbox"/>	
12"	60'	80'	Gravels (Small)	<input checked="" type="checkbox"/>	
12"	80'	100'	Gravels (Small)	<input checked="" type="checkbox"/>	
12"	100'	120'	Gravel (Large)	<input checked="" type="checkbox"/>	
12"	120'	140'	Gravel (mixed)	<input checked="" type="checkbox"/>	

Completed Depth 140' (Measurable)
 Date: Started 11-26-04 Completed 4-28-05

RECEIVED
 MAY 06 2005

Department of Water Resources
 Eastern Region

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 Denning Well Drilling Firm No. 518
 Principal Driller Denning Date 4-28-05
 and Driller or Operator II _____ Date _____
 Operator I Denning Date 2/17/05
 Principal Driller and Rig Operator Required.
 Operator I must have signature of Driller/Operator II.

APPENDIX C: SOIL RESOURCES



United States
Department of
Agriculture

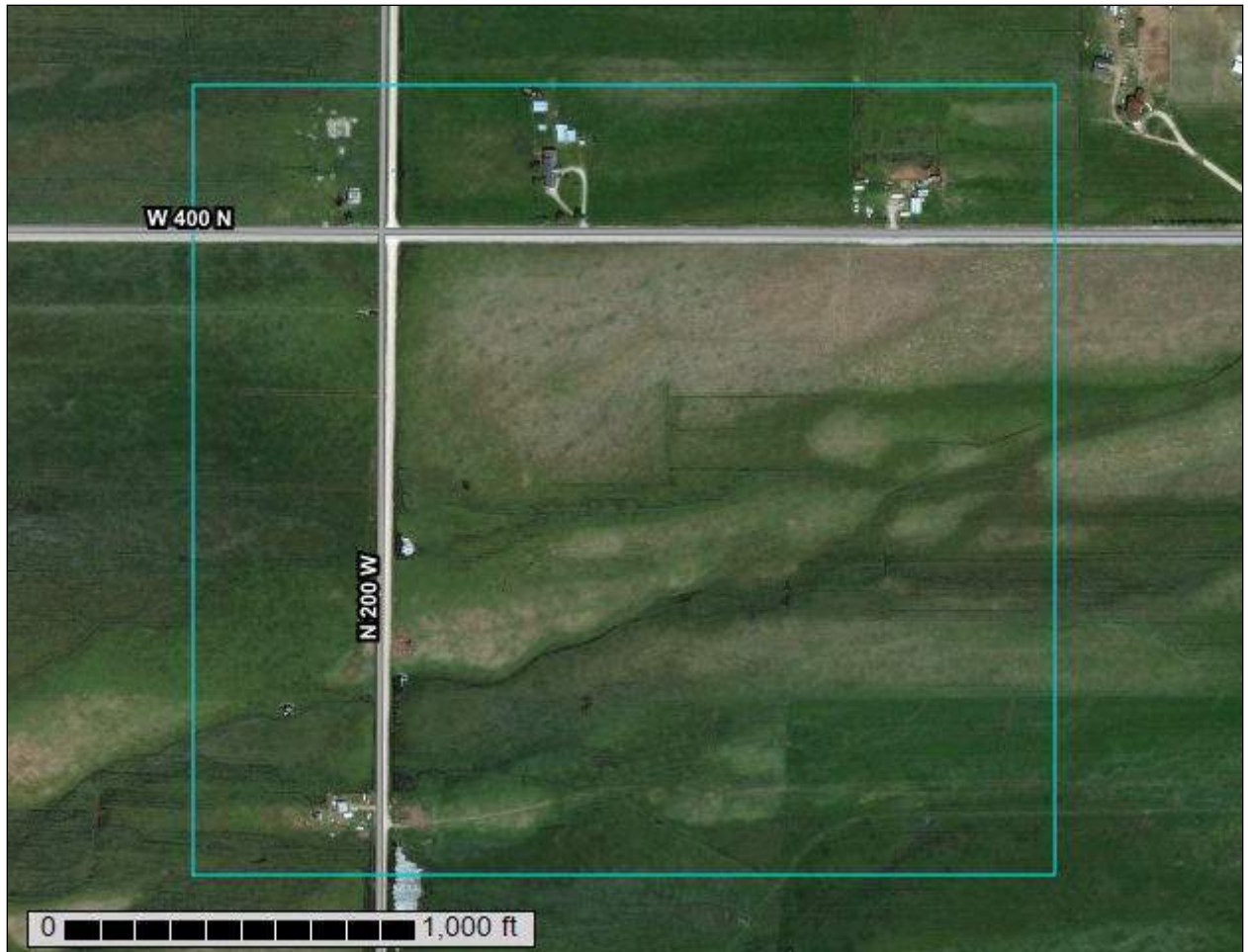
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Teton Area, Idaho and Wyoming**

**21094 CLOUD VEIL LLC, Teton
ID**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

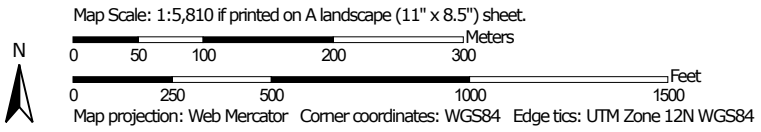
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

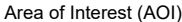



































Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Soils**
 -  Soil Map Unit Polygons
 -  Soil Map Unit Lines
 -  Soil Map Unit Points
- Special Point Features**
 -  Blowout
 -  Borrow Pit
 -  Clay Spot
 -  Closed Depression
 -  Gravel Pit
 -  Gravelly Spot
 -  Landfill
 -  Lava Flow
 -  Marsh or swamp
 -  Mine or Quarry
 -  Miscellaneous Water
 -  Perennial Water
 -  Rock Outcrop
 -  Saline Spot
 -  Sandy Spot
 -  Severely Eroded Spot
 -  Sinkhole
 -  Slide or Slip
 -  Sodic Spot
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background**
 -  Aerial Photography
- Other Features**
 -  Spoil Area
 -  Stony Spot
 -  Very Stony Spot
 -  Wet Spot
 -  Other
 -  Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Teton Area, Idaho and Wyoming
 Survey Area Data: Version 9, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 24, 2011—Oct 25, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13101	Redfish-Foxcreek complex, 0 to 2 percent slopes	68.2	53.4%
13113	Foxcreek mucky peat, 0 to 2 percent slopes	10.3	8.1%
13429	Alpine gravelly loam, 0 to 2 percent slopes	9.4	7.4%
13430	Alpine-St. Anthony complex, 0 to 2 percent slopes	17.5	13.7%
13431	Feltonia-Arimo complex, 0 to 2 percent slopes	22.1	17.3%
Totals for Area of Interest		127.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Teton Area, Idaho and Wyoming

13101—Redfish-Foxcreek complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qmkh
Elevation: 5,920 to 6,230 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 38 to 44 degrees F
Frost-free period: 20 to 50 days
Farmland classification: Not prime farmland

Map Unit Composition

Redfish and similar soils: 70 percent
Foxcreek and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Redfish

Setting

Landform: Fan remnants, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Oe - 0 to 2 inches: mucky peat
A - 2 to 10 inches: loam
AB - 10 to 13 inches: gravelly loam
2BC - 13 to 16 inches: very gravelly loamy sand
2C - 16 to 43 inches: extremely gravelly sand
2Cg - 43 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): 6c
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C/D
Ecological site: R013XY050ID - RIPARIAN WET MEADOW SALIX/CAREX
Hydric soil rating: Yes

Description of Foxcreek

Setting

Landform: Flood plains, drainageways

Down-slope shape: Linear

Across-slope shape: Linear, concave

Parent material: Mixed alluvium

Typical profile

Oe - 0 to 2 inches: mucky peat

Ag - 2 to 8 inches: loam

ABg - 8 to 15 inches: loam

Bg1 - 15 to 21 inches: loam

2Bg2 - 21 to 26 inches: very gravelly coarse sandy loam

2Bkg - 26 to 42 inches: very gravelly loamy sand

2Cg - 42 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 0.57 in/hr)

Depth to water table: About 0 to 10 inches

Frequency of flooding: OccasionalNone

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 6c

Land capability classification (nonirrigated): 6c

Hydrologic Soil Group: C/D

Ecological site: R013XY050ID - RIPARIAN WET MEADOW SALIX/CAREX

Hydric soil rating: Yes

13113—Foxcreek mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qmks

Elevation: 5,920 to 6,520 feet

Mean annual precipitation: 16 to 18 inches

Mean annual air temperature: 38 to 44 degrees F

Frost-free period: 20 to 50 days

Farmland classification: Not prime farmland

Map Unit Composition

Foxcreek and similar soils: 90 percent

Custom Soil Resource Report

Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Foxcreek

Setting

Landform: Flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Mixed alluvium

Typical profile

Oe - 0 to 2 inches: mucky peat
Ag - 2 to 8 inches: loam
ABg - 8 to 15 inches: loam
Bg1 - 15 to 21 inches: loam
2Bg2 - 21 to 26 inches: very gravelly coarse sandy loam
2Bkg - 26 to 42 inches: very gravelly loamy sand
2Cg - 42 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 0.57 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 6c
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C/D
Ecological site: R013XY050ID - RIPARIAN WET MEADOW SALIX/CAREX
Hydric soil rating: Yes

Minor Components

Zufelt, occasionally flooded

Percent of map unit: 10 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: R013XY039ID - DRY MEADOW PONE-PHAL2
Hydric soil rating: Yes

13429—Alpine gravelly loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1v280
Elevation: 5,970 to 6,500 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 38 to 44 degrees F
Frost-free period: 50 to 90 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alpine and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alpine

Setting

Landform: Fan remnants
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Mixed alluvium

Typical profile

A1 - 0 to 2 inches: gravelly loam
A2 - 2 to 11 inches: very gravelly loam
ABk - 11 to 17 inches: extremely gravelly loam
Bk - 17 to 25 inches: extremely gravelly sandy loam
Bkq - 25 to 31 inches: extremely gravelly loamy sand
Bk' - 31 to 35 inches: extremely gravelly sandy loam
Bkq' - 35 to 44 inches: extremely gravelly loamy sand
Bk1" - 44 to 51 inches: extremely gravelly sandy loam
Bk2" - 51 to 60 inches: gravel

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): 4c
Land capability classification (nonirrigated): 6s

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Hydrologic Soil Group: B

Ecological site: R013XY004ID - SHALLOW GRAVELLY 12-16 ARTRV/PSSPS

Hydric soil rating: No

13430—Alpine-St. Anthony complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1vghp

Elevation: 5,910 to 6,480 feet

Mean annual precipitation: 16 to 18 inches

Mean annual air temperature: 38 to 44 degrees F

Frost-free period: 50 to 90 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alpine and similar soils: 50 percent

St. anthony and similar soils: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alpine

Setting

Landform: Stream terraces, fan remnants

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Mixed alluvium

Typical profile

A1 - 0 to 2 inches: gravelly loam

A2 - 2 to 11 inches: very gravelly loam

ABk - 11 to 17 inches: extremely gravelly loam

Bk - 17 to 25 inches: extremely gravelly sandy loam

Bkq - 25 to 31 inches: extremely gravelly loamy sand

Bk' - 31 to 35 inches: extremely gravelly sandy loam

Bkq' - 35 to 44 inches: extremely gravelly loamy sand

Bk1" - 44 to 51 inches: extremely gravelly sandy loam

Bk2" - 51 to 60 inches: gravel

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 75 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): 4c
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: R013XY004ID - SHALLOW GRAVELLY 12-16 ARTRV/PSSPS
Hydric soil rating: No

Description of St. Anthony

Setting

Landform: Swales on fan remnants
Down-slope shape: Convex, concave, linear
Across-slope shape: Linear, concave
Parent material: Gravelly mixed alluvium

Typical profile

A1 - 0 to 7 inches: gravelly loam
A2 - 7 to 12 inches: gravelly loam
Bw - 12 to 23 inches: very gravelly sandy loam
BC - 23 to 47 inches: extremely gravelly coarse sandy loam
2C - 47 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 4c
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: R013XY004ID - SHALLOW GRAVELLY 12-16 ARTRV/PSSPS
Hydric soil rating: No

13431—Feltonia-Arimo complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1vlkd
Elevation: 5,950 to 6,240 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 38 to 44 degrees F
Frost-free period: 50 to 90 days

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Farmland classification: Prime farmland if irrigated

Map Unit Composition

Feltonia and similar soils: 75 percent

Arimo and similar soils: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Feltonia

Setting

Landform: Fan remnants, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear, convex

Parent material: Mixed alluvium with loess influence

Typical profile

Ap - 0 to 6 inches: loam

A - 6 to 12 inches: loam

Bw1 - 12 to 20 inches: loam

Bw2 - 20 to 27 inches: loam

Bk1 - 27 to 36 inches: loam

Bk2 - 36 to 49 inches: very gravelly loam

2Bk3 - 49 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 4c

Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: C

Ecological site: R013XY001ID - LOAMY 12-16 - Provisional

Hydric soil rating: No

Description of Arimo

Setting

Landform: Fan remnants, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium with loess influence

Typical profile

Ap1 - 0 to 2 inches: loam

Ap2 - 2 to 13 inches: loam

Bw - 13 to 15 inches: loam

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Bk1 - 15 to 25 inches: loam
Bk2 - 25 to 29 inches: very gravelly sandy loam
2Bkq - 29 to 35 inches: extremely gravelly loamy sand
2C - 35 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 36 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 4c
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R013XY001ID - LOAMY 12-16 - Provisional
Hydric soil rating: No

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Vegetative Productivity

This folder contains a collection of tabular reports that present vegetative productivity data. The reports (tables) include all selected map units and components for each map unit. Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition (21094 CLOUD VEIL LLC)

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

This table shows, for each soil that supports vegetation, the ecological site, plant association, or habitat type; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average

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percentage of each species. An explanation of the column headings in the table follows.

An ecological site, plant association, or habitat type is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site, plant association, or habitat type is typified by an association of species that differs from that of other ecological sites, plant associations, or habitat types in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service (NRCS). Descriptions of plant associations or habitat types are available from local U.S. Forest Service offices.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation (the grasses, forbs, shrubs, and understory trees that make up most of the potential natural plant community on each soil) is listed by common name. Under *rangeland composition and forest understory*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The percentages are by dry weight for rangeland. Percentages for forest understory are by either dry weight or canopy cover. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in the "National Range and Pasture Handbook," which is available in local offices of NRCS or on the Internet.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity

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index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service, [National range and pasture handbook](#).

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Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition—Teton Area, Idaho and Wyoming								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition	Rangeland	Forest understory
		Favorable year	Normal year	Unfavorable year				
		<i>Lb/ac</i>	<i>Lb/ac</i>	<i>Lb/ac</i>		<i>Pct dry wt</i>	<i>Pct dry wt</i>	
13101—Redfish-Foxcreek complex, 0 to 2 percent slopes								
Redfish	RIPARIAN WET MEADOW SALIX/CAREX (R013XY050ID)	3,500	2,500	2,000	beaked sedge	25		
					water sedge	25		
					willow	25		
					Baltic rush	10		
					Shrubby cinquefoil	5		
Foxcreek	RIPARIAN WET MEADOW SALIX/CAREX (R013XY050ID)	3,500	2,500	2,000	beaked sedge	25		
					water sedge	25		
					willow	25		
					Baltic rush	10		
					Shrubby cinquefoil	5		
13113—Foxcreek mucky peat, 0 to 2 percent slopes								
Foxcreek	RIPARIAN WET MEADOW SALIX/CAREX (R013XY050ID)	3,500	2,500	2,000	beaked sedge	25		
					water sedge	25		
					willow	25		
					Baltic rush	10		
					Shrubby cinquefoil	5		

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Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition—Teton Area, Idaho and Wyoming								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition	Rangeland	Forest understory
		Favorable year	Normal year	Unfavorable year				
		<i>Lb/ac</i>	<i>Lb/ac</i>	<i>Lb/ac</i>		<i>Pct dry wt</i>	<i>Pct dry wt</i>	
13429—Alpine gravelly loam, 0 to 2 percent slopes								
Alpine	SHALLOW GRAVELLY 12-16 ARTRV/PSSPS (R013XY004ID)	1,000	750	400	bluebunch wheatgrass	40		
					mountain big sagebrush	20		
					Idaho fescue	10		
					tapertip hawksbeard	8		
					antelope bitterbrush	5		
13430—Alpine-St. Anthony complex, 0 to 2 percent slopes								
Alpine	SHALLOW GRAVELLY 12-16 ARTRV/PSSPS (R013XY004ID)	1,000	750	400	bluebunch wheatgrass	40		
					mountain big sagebrush	20		
					Idaho fescue	10		
					tapertip hawksbeard	8		
					antelope bitterbrush	5		
St. anthony	SHALLOW GRAVELLY 12-16 ARTRV/PSSPS (R013XY004ID)	1,000	750	400	bluebunch wheatgrass	40		
					mountain big sagebrush	20		
					Idaho fescue	10		
					tapertip hawksbeard	8		
					antelope bitterbrush	5		

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Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition—Teton Area, Idaho and Wyoming								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition	Rangeland	Forest understory
		Favorable year	Normal year	Unfavorable year				
		<i>Lb/ac</i>	<i>Lb/ac</i>	<i>Lb/ac</i>		<i>Pct dry wt</i>	<i>Pct dry wt</i>	
13431—Feltonia-Arimo complex, 0 to 2 percent slopes								
Feltonia	LOAMY 12-16 - Provisional (R013XY001ID)	1,800	1,200	800	bluebunch wheatgrass	40		
					mountain big sagebrush	15		
					arrowleaf balsamroot	10		
					Idaho fescue	10		
					Letterman's needlegrass	10		
					antelope bitterbrush	5		
					common snowberry	5		
Arimo	LOAMY 12-16 - Provisional (R013XY001ID)	1,800	1,200	800	bluebunch wheatgrass	40		
					mountain big sagebrush	15		
					arrowleaf balsamroot	10		
					Idaho fescue	10		
					Letterman's needlegrass	10		
					antelope bitterbrush	5		
					common snowberry	5		

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APPENDIX D: NUTRIENT MASS BALANCE SPREADSHEETS

IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

This spreadsheet is based on the mass balance approach documented in: 1985.Bauman, B.J. and W.M. Schaefer. Estimating Ground-Water Quality Impacts From On-Site Sewage Treatment Systems. In Proceedings of 5th Northwest On-Site Wastewater Treatment Shortcourse, September 10-11, 1985. University of Washington, Seattle, WA. Pages 23-41. See **Instructions for Use** below.

INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	2.02E+05	95.0
Hydraulic Gradient	0.01	Site-specific		Effluent	4.14E+03	2.0
Mixing Zone Thickness (ft)	15	15	Default	Recharge	6.51E+03	3.1
Aquifer Width Perpendicular to Flow (ft)	1300	Site-specific		Total Water Volume	2.12E+05	
Parcel Area (acres)	40	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	10.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	4.1	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	4.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	6.86E+08	78.4
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+08	21.3
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.95E+06	0.2
				Total Nitrate Mass	8.74E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP * 0.0046$
TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Entire Property	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
Disclaimer: Considerable care was exercised in developing this software. However, the Idaho Department of Environmental Quality makes no warranty regarding its accuracy and shall not be held liable for any damages resulting from its use.	
	

IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

This spreadsheet is based on the mass balance approach documented in: 1985.Bauman, B.J. and W.M. Schaefer. Estimating Ground-Water Quality Impacts From On-Site Sewage Treatment Systems. In Proceedings of 5th Northwest On-Site Wastewater Treatment Shortcourse, September 10-11, 1985. University of Washington, Seattle, WA. Pages 23-41. See **Instructions for Use** below.

INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	5.99E+04	98.6
Hydraulic Gradient	0.0117	Site-specific		Efluent	4.14E+02	0.7
Mixing Zone Thickness (ft)	15	15	Default	Recharge	4.07E+02	0.7
Aquifer Width Perpendicular to Flow (ft)	330	Site-specific		Total Water Volume	6.07E+04	
Parcel Area (acres)	2.5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.7	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	2.5	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.04E+08	91.6
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	8.4
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.22E+05	0.1
				Total Nitrate Mass	2.22E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 1	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
Disclaimer: Considerable care was exercised in developing this software. However, the Idaho Department of Environmental Quality makes no warranty regarding its accuracy and shall not be held liable for any damages resulting from its use.	
	

IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

This spreadsheet is based on the mass balance approach documented in: 1985.Bauman, B.J. and W.M. Schaefer. Estimating Ground-Water Quality Impacts From On-Site Sewage Treatment Systems. In Proceedings of 5th Northwest On-Site Wastewater Treatment Shortcourse, September 10-11, 1985. University of Washington, Seattle, WA. Pages 23-41. See **Instructions for Use** below.

INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	6.20E+04	98.7
Hydraulic Gradient	0.01159	Site-specific		Effluent	4.14E+02	0.7
Mixing Zone Thickness (ft)	15	15	Default	Recharge	4.07E+02	0.6
Aquifer Width Perpendicular to Flow (ft)	345	Site-specific		Total Water Volume	6.29E+04	
Parcel Area (acres)	2.5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.7	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	2.5	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.11E+08	91.8
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	8.1
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.22E+05	0.1
				Total Nitrate Mass	2.30E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 2	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	8.44E+04	99.0
Hydraulic Gradient	0.0147	Site-specific		Efluent	4.14E+02	0.5
Mixing Zone Thickness (ft)	15	15	Default	Recharge	4.07E+02	0.5
Aquifer Width Perpendicular to Flow (ft)	370	Site-specific		Total Water Volume	8.52E+04	
Parcel Area (acres)	2.5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.6	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	2.5	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.87E+08	93.9
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	6.1
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.22E+05	0.0
				Total Nitrate Mass	3.06E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 3	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	7.38E+04	98.9
Hydraulic Gradient	0.012195	Site-specific		Effluent	4.14E+02	0.6
Mixing Zone Thickness (ft)	15	15	Default	Recharge	4.07E+02	0.5
Aquifer Width Perpendicular to Flow (ft)	390	Site-specific		Total Water Volume	7.46E+04	
Parcel Area (acres)	2.5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.6	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	2.5	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.51E+08	93.0
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	6.9
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.22E+05	0.0
				Total Nitrate Mass	2.70E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 4	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	1.98E+05	99.4
Hydraulic Gradient	0.019337	Site-specific		Efluent	4.14E+02	0.2
Mixing Zone Thickness (ft)	15	15	Default	Recharge	8.14E+02	0.4
Aquifer Width Perpendicular to Flow (ft)	660	Site-specific		Total Water Volume	1.99E+05	
Parcel Area (acres)	5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.5	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	5.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	6.73E+08	97.3
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	2.7
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	2.44E+05	0.0
				Total Nitrate Mass	6.92E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 5	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	1.82E+05	99.3
Hydraulic Gradient	0.01773	Site-specific		Efluent	4.14E+02	0.2
Mixing Zone Thickness (ft)	15	15	Default	Recharge	8.14E+02	0.4
Aquifer Width Perpendicular to Flow (ft)	660	Site-specific		Total Water Volume	1.83E+05	
Parcel Area (acres)	5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.5	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	5.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	6.17E+08	97.0
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	2.9
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	2.44E+05	0.0
				Total Nitrate Mass	6.36E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$ (inches/yr) = (TAP)² * 0.0046
TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 6	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	5.39E+04	97.8
Hydraulic Gradient	0.010526	Site-specific		Efluent	4.14E+02	0.8
Mixing Zone Thickness (ft)	15	15	Default	Recharge	8.14E+02	1.5
Aquifer Width Perpendicular to Flow (ft)	330	Site-specific		Total Water Volume	5.51E+04	
Parcel Area (acres)	5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.7	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	5.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	1.83E+08	90.7
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	9.2
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	2.44E+05	0.1
				Total Nitrate Mass	2.02E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


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Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 7	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	7.06E+04	98.3
Hydraulic Gradient	0.010343	Site-specific		Efluent	4.14E+02	0.6
Mixing Zone Thickness (ft)	15	15	Default	Recharge	8.14E+02	1.1
Aquifer Width Perpendicular to Flow (ft)	440	Site-specific		Total Water Volume	7.18E+04	
Parcel Area (acres)	5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.6	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	5.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.40E+08	92.7
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	7.2
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	2.44E+05	0.1
				Total Nitrate Mass	2.59E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP * 0.0046$ (inches/yr) = (TAP)² * 0.0046
TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 8	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

This spreadsheet is based on the mass balance approach documented in: 1985.Bauman, B.J. and W.M. Schaefer. Estimating Ground-Water Quality Impacts From On-Site Sewage Treatment Systems. In Proceedings of 5th Northwest On-Site Wastewater Treatment Shortcourse, September 10-11, 1985. University of Washington, Seattle, WA. Pages 23-41. See **Instructions for Use** below.

INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	7.67E+04	98.7
Hydraulic Gradient	0.0112296	Site-specific		Efluent	4.14E+02	0.5
Mixing Zone Thickness (ft)	15	15	Default	Recharge	5.70E+02	0.7
Aquifer Width Perpendicular to Flow (ft)	440	Site-specific		Total Water Volume	7.76E+04	
Parcel Area (acres)	3.5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.6	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	3.5	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	2.61E+08	93.3
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	6.7
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	1.71E+05	0.1
				Total Nitrate Mass	2.79E+08	

Instructions for Use

Input parameter values appropriate to conditions at the site under consideration are entered in the **blue shaded cells** on the **INPUT** side of the spreadsheet. These input values form the basis for calculating yearly water and nitrogen budgets. Default values for selected parameters are provided, as described in the accompanying N-P guidance. Selecting values other than these defaults will require providing adequate justification. Sources of water and nitrogen include ground water inflow from upgradient, natural recharge on pervious portions of the site, and from septic tank effluent. The total yearly nitrogen mass input is then divided by the total yearly volume of water available to recharge groundwater to arrive at an estimated **Average Downgradient Nitrate Concentration in GW** (shown in the **OUTPUT** side of the spreadsheet).


As values are input into the **blue shaded cells** the totals and percent of total for various components of the water and nitrogen budgets are calculated and shown on the **OUTPUT** side of the spreadsheet. The **Avg. Downgradient Nitrate Concentration in GW** is also calculated. The Density button allows the calculation of both the Acceptable Number of Homes in the Parcel (shown in the **INPUT** area) as well as the acceptable lot size. Clicking the Density button opens an input box that allows the input of the **Point of Compliance Nitrate Concentration Goal**. The number of homes in the parcel is then adjusted to meet the specified goal. This calculation can be redone iteratively along with changing other site input parameters to examine the resultant impact on nitrate concentrations.

Aquifer Width Perpendicular to Flow: For land development projects not completely oriented perpendicular to ground water flow, the site specific aquifer width value is determined using the average property width that is perpendicular to flow.

Ranges of Hydraulic Conductivity (K) for Unconsolidated Sediments (feet/day)	
Silt and sandy silt	0.003 to 0.3
Silty sands and fine sands	0.03 to 3
Well-sorted sands and glacial outwash	3 to 300
Well-sorted gravel	30 to 3000
Typical Range of Hydraulic Gradient	0.0001 to 0.1

Natural Recharge Rate (NRR) can be estimated from total annual precipitation (TAP) using the equation: $NRR = TAP \times 0.0046$. TAP is input in inches/yr.

SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 9	Parcel Identification
9/25/2022	Date
Adrienne Lemmers, PE Y2 Consultants, LLC	Prepared By
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IDEQ LEVEL 1 NUTRIENT-PATHOGEN EVALUATION NITROGEN MASS-BALANCE SPREADSHEET

V. 1.3 5/2/2002

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INPUT				OUTPUT		
Water Budget	Input Value	Default Value		Yearly Water Budget	Volume (m³)	% of Total
Hydraulic Conductivity (ft/day)	100.000	Site-specific		Ground Water	5.44E+04	97.8
Hydraulic Gradient	0.010025	Site-specific		Effluent	4.14E+02	0.7
Mixing Zone Thickness (ft)	15	15	Default	Recharge	8.14E+02	1.5
Aquifer Width Perpendicular to Flow (ft)	350	Site-specific		Total Water Volume	5.57E+04	
Parcel Area (acres)	5	Site-specific				
Percent of Parcel That Is Impervious (Percent)	4	Site-specific		Point of Compliance Nitrate Concentration Goal (mg/l)	4.4	
Current/Acceptable Number of Homes in Parcel	1.0	Site-specific				
Septic Tank Effluent (gallons/d/home)	300	300	Default	Avg. Downgradient Nitrate Concentration in GW (mg/l)	3.7	
Natural Recharge rate (inches/yr)	1.65	Site-specific		Current/Acceptable Lot Size (Acres)	5.0	
Nitrogen Budget (all concentrations represent nitrate nitrogen)				Yearly Nitrogen Budget		
Upgradient Ground Water Concentration (mg/l)	3.4	Site-specific			Mass (mg)	% of Total
Septic Tank Effluent Concentration (mg/l)	45.0	45.0	Default	Background GW Nitrate Mass	1.85E+08	90.7
Denitrification Rate (decimal fraction)		0	Default	Septic Tank Effluent Nitrate Mass	1.87E+07	9.1
Nitrate in Natural Recharge (mg/l)	0.3	0.3	Default	Recharge Nitrate Mass	2.44E+05	0.1
				Total Nitrate Mass	2.04E+08	

Instructions for Use

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SITE INFORMATION

Irish Acres Subdivision	Site Name
Lot 10	Parcel Identification
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