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550 S. 24<sup>th</sup> STREET W., SUITE 201, BILLINGS, MT 59102 | 406.894.2210

January 14, 2022

County Water District of Billings Heights  
1540 Popelka Drive  
Billings, MT 59105

**Re: Request for Annexation**

Dear County Water District,

This letter is being prepared on behalf of our client, Mr. Owen, for the annexation of their property, Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing, into the County Water District of Billings Heights. Below are the items requested for the annexation petition:

1. Property Legal Description: Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing
2. Property Metes and Boundary Description: Beginning at the northwest corner of Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing, marked by a yellow plastic cap; thence on the north line of said Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing, N88°55'24"E a distance of 149.98 feet to the corner common to said Lot 8, Lot 1, Lot 2, and Lot 7, Block 3 of Spring Hills Acreage Tracts, Second Filing; thence on the line common to said Lot 8 and Lot 7, Block 3 of Spring Hills Acreage Tracts, Second Filing, S00°53'14"E a distance of 299.75 feet to the corner common to said Lot 8 and Lot 7, Block 3 of Spring Hills Acreage Tracts, Second Filing; thence on the line common to said Lot 8 and Lot 7, Block 3 of Spring Hills Acreage Tracts, Second Filing, S88°53'58"W a distance of 149.89 feet to the corner common to said Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing marked by an iron pipe; thence on the west line of said Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing, N00°54'13"W a distance of 299.81 feet to the northwest corner of said Lot 8, Block 3 of Spring Hills Acreage Tracts, Second Filing which is also the Point of Beginning.
3. The original subdivision plat is enclosed.
4. The site plan and design submittal packet for MDEQ review on the property improvements is enclosed.  
[SEE EXHIBIT A]
5. The current zoning of the property is vacant - rural. The proposed use of the property will be for residential.
6. The buy-in fee will be paid directly by Mr. Owen.

Sincerely,

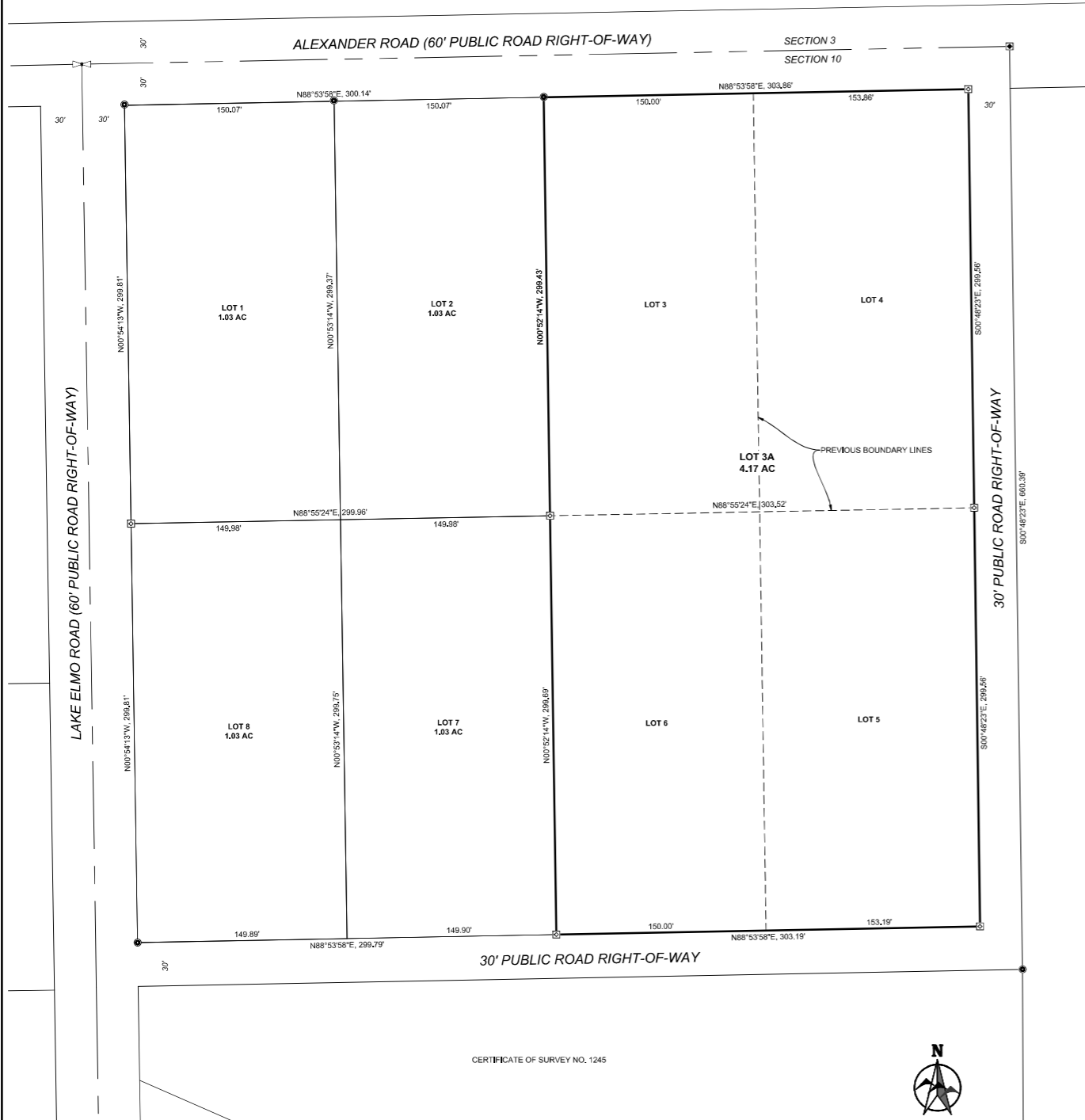
Shawn Thorson  
Professional Engineer

Cc: Mr. Owen

# AMENDED PLAT OF SPRING HILLS ACREAGE TRACTS, SECOND FILING

AMENDING LOTS 3, 4, 5, AND 6 OF BLOCK 3 OF SPRING HILLS ACREAGE TRACTS, SECOND FILING  
 WITHIN NW1/4NE1/4 OF SECTION 10, T01N, R26E, P.M.M.,  
 YELLOWSTONE COUNTY, MONTANA

PREPARED FOR: MR. AND MRS. YOUREE  
 DATE SURVEYED: AUGUST 2020  
 PREPARED BY: WWC ENGINEERING



### LEGAL DESCRIPTION

Lots 3, 4, 5 and 6 of Block 3 of Spring Hills Acreage Tracts, Second Filing filed as Document No. 632977, within NW1/4NE1/4 of Section 10, T01N, R26E, P.M.M., Yellowstone County, Montana.

Said tract of land contains a gross and net area of 4.17 acres, more or less, and is subject to any easements, reservations, or other encumbrances that have been legally acquired.

### LANDOWNERS CERTIFICATE

We hereby certify that the purpose of this survey is to aggregate parcels within a subdivision and boundaries of a larger aggregate parcel is established. Therefore this division of land is exempt from review as a subdivision pursuant to M.C.A. 76-3-207(1)(F).

We further certify that pursuant to ARM 24.183.1104(1)(f)(ii)(C), "The area that is being removed from one tract of record and joined with another tract of record is not itself a tract of record. Said area shall not be available as a reference legal description in any subsequent real property transfer after the initial transfer associated with the [certificate of survey or amended plat] on which said area is described, unless said area is included with or excluded from adjoining tracts of record."

We further certify that this survey is exempt from D.E.Q. review in accordance with ARM 17.36.605(3) for "aggregations of parcels are not subdivisions subject to review, except that an aggregation is subject to review under 76-4-130, MCA, if any parcel included in the aggregation has a previous approval issued under Title 76, Chapter 4, Part 1, M.C.A."

Jimmie Lee Youree Jr.

Teresa Kay Youree

### ACKNOWLEDGEMENT

State of \_\_\_\_\_ )  
 County of \_\_\_\_\_ ) SS

on this \_\_\_\_\_ day of \_\_\_\_\_, 2020, before me, the undersigned a notary public for the State of \_\_\_\_\_, personally appeared Jimmie Lee Youree Jr and Teresa Kay Youree, known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

Notary Public in and for the State of Montana  
 Printed Name \_\_\_\_\_  
 Residing at \_\_\_\_\_  
 My commission expires \_\_\_\_\_

### VICINITY MAP

NOT TO SCALE



### CERTIFICATE OF SURVEYOR

I, Jake K. Ziska, a Professional Land Surveyor registered in the State of Montana, do hereby certify that this survey correctly represents work performed by me or under my direct supervision, and is true and correct to the best of my knowledge and belief.

Dated the \_\_\_\_\_ day of \_\_\_\_\_, 2020

Jake K. Ziska  
 Registration Number 18636 LS



### CERTIFICATE OF COUNTY ATTORNEY

This Amended Plat has been reviewed by the County Attorney's Office and is acceptable to form.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2020

Reviewed by \_\_\_\_\_

### CERTIFICATE OF RIVERSTONE HEALTH

This Certificate of Survey has been reviewed and approved by the Yellowstone City/County Health Department (d/b/a/ RiverStone Health)

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2020

Reviewed by \_\_\_\_\_

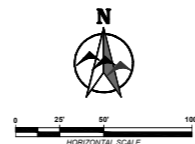
### CERTIFICATE OF COUNTY TREASURER

I hereby certify, pursuant to Section 76-3-207(3), MCA, that all real property taxes and special assessments assessed and levied on the land described on this subdivision plat and encompassed by the proposed division have been paid.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

TREASURER  
 YELLOWSTONE COUNTY, MONTANA

CERTIFICATE OF SURVEY NO. 1245



LEGEND	
	SET 5/8"x24" REBAR W/ YELLOW PLASTIC CAP (ZISKA 18636 LS)
	FOUND XX REBAR
	FOUND 1" IRON PIPE
	1/4 SECTION CORNER - NOTHING FOUND OR SET
	PREVIOUS LOT LINE
	ADJACENT LOT LINE
	MEASURED (THIS SURVEY)
	RECORD (SPRING HILLS ACREAGE TRACTS, SECOND FILING)

### NOTES

- BASIS OF BEARING: NAD83(2011) MONTANA STATE PLANE COORDINATE SYSTEM, GRID
- DISTANCES: GROUND, INTERNATIONAL FOOT

PAGE 1 OF 1

QRTR.	SEC.	TWP.	RGE.
<input checked="" type="checkbox"/>	10	01N	26E

## AMENDED PLAT OF SPRING HILLS ACREAGE TRACTS, SECOND FILING

JOB#: 2020-230

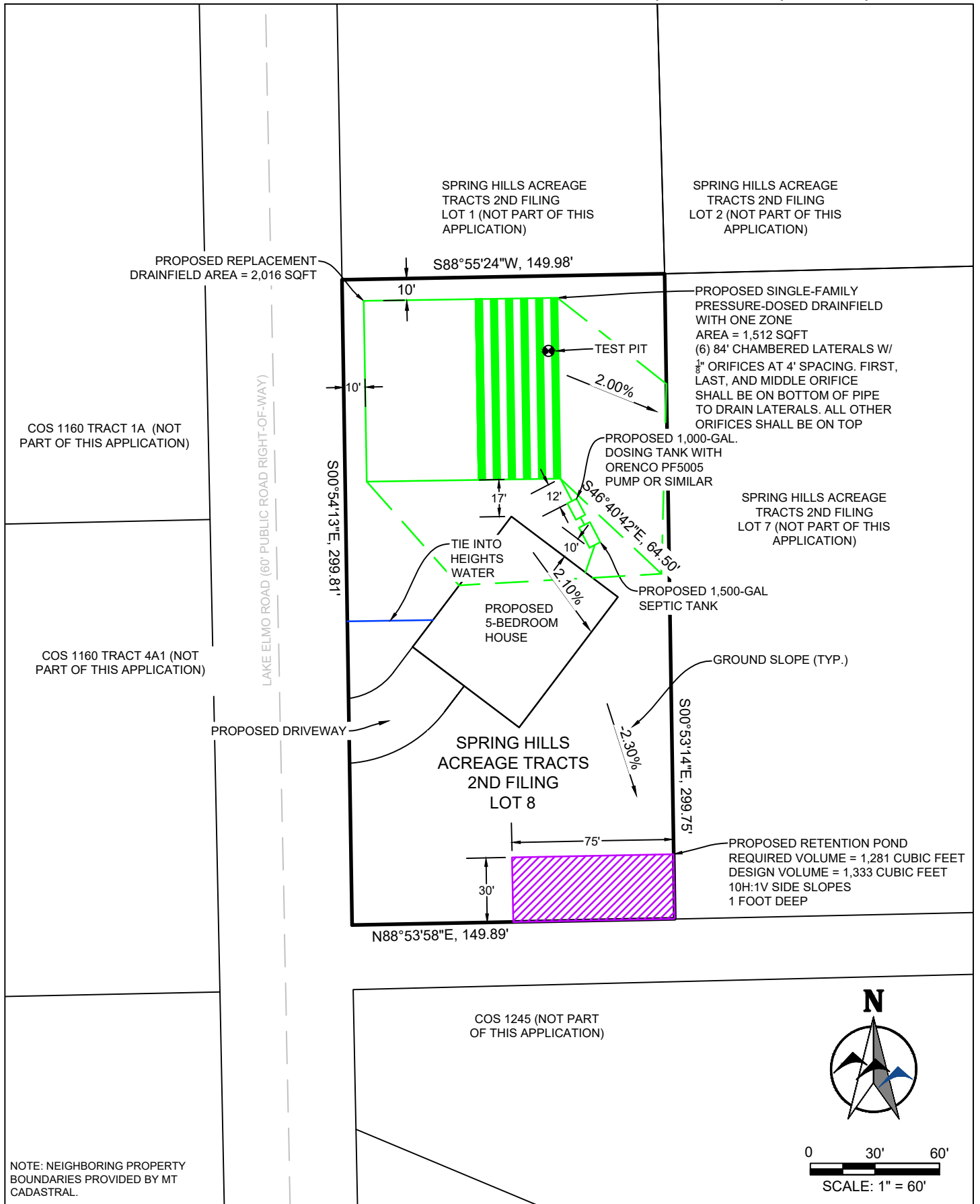
REVISIONS	
Date	By



Drawn By: AMR | Checked by: AMR/UPB | Date: AUGUST 2020 | Scale: 1" = 50'

# EXHIBIT A





**SPRING HILLS 2ND FILING, LOT 8**  
**SITE LAYOUT**  
 YELLOWSTONE COUNTY, MT

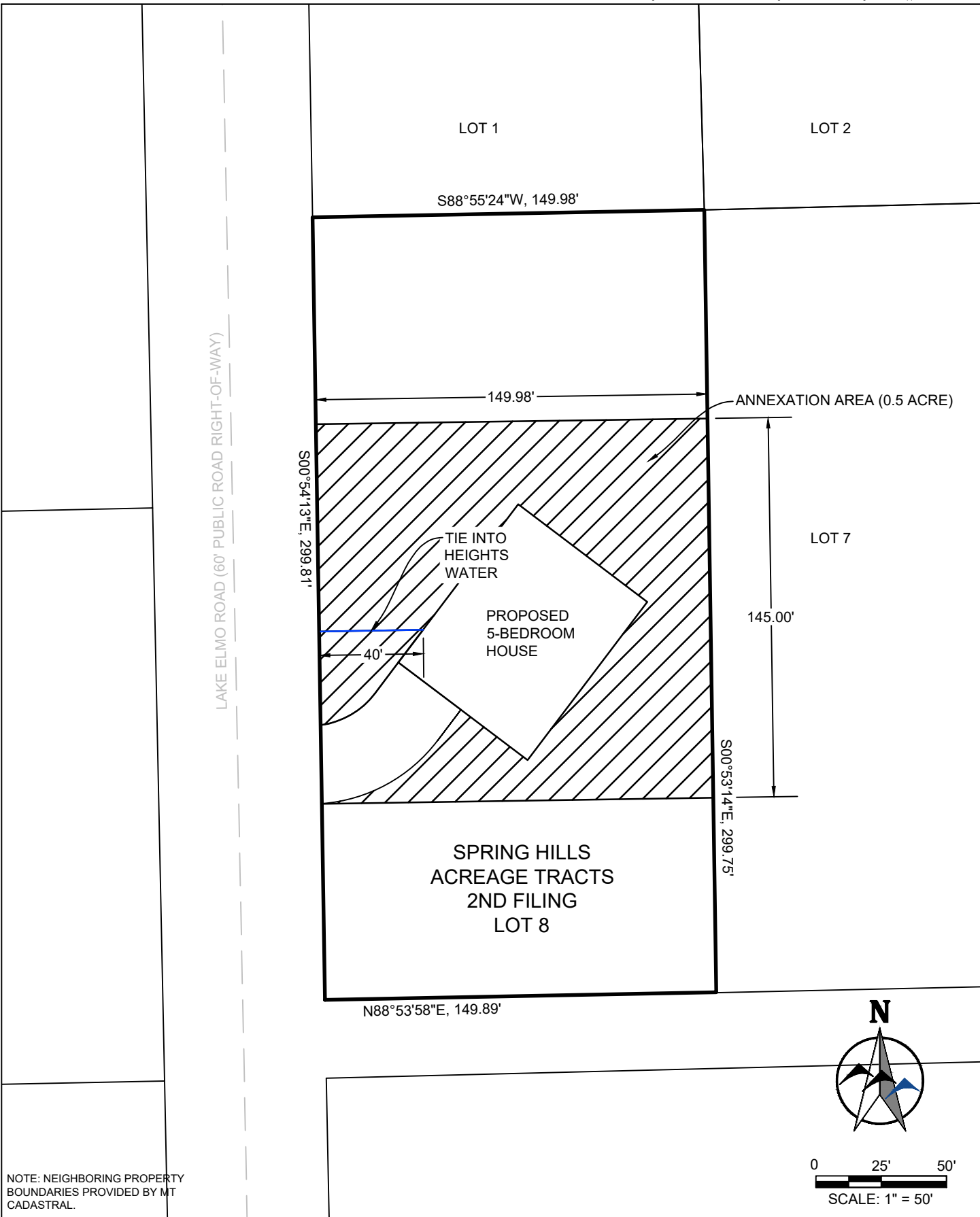
PREPARED FOR  
**BROCK OWEN**

PREPARED BY  
 WWC ENGINEERING

550 S. 24TH ST. W., SUITE 201  
 BILLINGS, MT 59102  
 (406) 894-2210  
 www.wwcengineering.com

DESIGNED BY: SMC  
 DRAWN BY: SMC  
 CHECKED BY: SMT  
 DATE: 11/29/2021

**EXHIBIT A**  
 1 OF 2



NOTE: NEIGHBORING PROPERTY BOUNDARIES PROVIDED BY MT CADASTRAL.



0 25' 50'  
SCALE: 1" = 50'

**SPRING HILLS 2ND FILING, LOT 8**  
**HEIGHTS WATER ANNEXATION**  
 YELLOWSTONE COUNTY, MT

PREPARED FOR  
**BROCK OWEN**

DESIGNED BY: *SMC*  
 DRAWN BY: *SMC*  
 CHECKED BY: *SMT*  
 DATE: 11/29/2021

PREPARED BY  
  
 550 S. 24TH ST. W., SUITE 201  
 BILLINGS, MT 59102  
 (406) 894-2210  
 www.wwcengineering.com

**EXHIBIT A**  
2 OF 2

SPRING HILLS ACREAGE 2<sup>ND</sup> FILING

LOT 8

YELLOWSTONE COUNTY WATER,  
WASTEWATER, STORMWATER, AND  
SOLID WASTE DESIGN REPORT

PREPARED FOR:  
**BROCK OWEN**  
3117 PEREGRINE LANE  
BILLINGS, MT 59106

PREPARED BY:



550 S 24<sup>TH</sup> STREET W, SUITE 201  
BILLINGS, MT 59102  
(406) 894-2210  
[WWW.WWCENGINEERING.COM](http://WWW.WWCENGINEERING.COM)

NOVEMBER 2021

# SPRING HILLS ACREAGE 2<sup>ND</sup> FILING LOT 8

## YELLOWSTONE COUNTY WATER, WASTEWATER, STORMWATER, AND SOLID WASTE DESIGN REPORT

*Prepared for:* Brock Owen  
3117 Peregrine Lane  
Billings, MT 59106

*Prepared by:* WWC Engineering  
550 S 24<sup>th</sup> Street W, Suite 201  
Billings, MT 59102  
(406) 894-2210

*Principal Author:* Steven Carreiro, Associate Engineer

*Reviewed by:* Jack Fritz, P.E., Director of Operations

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Appendix B	Vicinity Map and Site Layout
Appendix C	FIRMette
Appendix D	USGS Topographic Map
Appendix E	Hydraulic Gradient and Well Logs
Appendix F	Test Pit Log
Appendix G	Drainfield Sizing and Dosing Calculations
Appendix H	Water Analysis
Appendix I	Nitrate Sensitivity Analysis and Conductivity
Appendix J	Phosphorus Breakthrough Analysis
Appendix K	Stormwater Analysis
Appendix L	Sage Grouse



## OVERVIEW

The project is located approximately 0.8 mile north of Lake Elmo in Billings, MT, on Lot 8 of the Amended Plat of Spring Hills Acreage Tracts, Second Filing (the Property), in the NW ¼ NE ¼, Section 10, T01N, R26E, P.M.M., Yellowstone County. The certificate of survey is provided in Appendix A. A vicinity map is provided in Appendix B.

The project includes developing Lot 8 to include a 5-bedroom, single-family residence. Water will be supplied to the residence from Heights Water. Wastewater will be treated and disposed in an individual septic system.

## SITE DESCRIPTION

The Property is currently undeveloped with no facilities. General topography of the site slopes at about 2% to the southeast. A topographic map is included in Appendix D. A site layout included in Appendix B shows the proposed lot layout, drainage directions, and proposed stormwater controls. The tract of land is located in “Zone X - Area of Minimal Flood Hazard” as indicated by the Federal Emergency management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 30111C1280E, from which a FIRMette (scaled version of a FIRM) of the subdivision is provided in Appendix C.

## WATER AVAILABILITY

Water will be provided to the Property by tapping into the Heights Water main on Lake Elmo Road west of the Property. A letter of approval is included in Appendix E.

## WASTEWATER SYSTEM DESIGN

The wastewater design for the Property includes a proposed drainfield with a 1,500-gallon septic tank sized per Circular DEQ-4, Section 5.1.6. The design flow rate for the 5-bedroom house is 400 gpd.

General information utilized in the design includes the following:

- Hydraulic Gradient
  - S46° 40' 42"E at 0.006667 ft/ft
- The hydraulic gradient direction and slope were developed using the “One-Third Regional Topographic Slope” method from DEQ’s “How to Perform a Nondegradation Analysis.” Calculations for the slope are included in Appendix E. With this method, the groundwater direction is assumed to move in the same direction as the overall topographic slope at a gradient of one-third of the topographic gradient.

WWC conducted a site visit to sample one test pit on June 9, 2020. Based on the sandy clay soil encountered in the pit, an application rate of 0.2 gpd/sqft was assigned. The test pit log is provided in Appendix F. No groundwater was encountered down to 10 feet to the bottom of the pit. Based on the test pit log and the groundwater elevations gathered from well logs of nearby wells, seasonally high groundwater is more than 4 feet below natural soil from the bottom of the infiltrative surface. The area of the drainfield was calculated in accordance with Circular DEQ-4 by dividing the wastewater flow rate by the application rate. Per Circular DEQ-4, 25% reduction is acceptable with the use of chambers, therefore requiring a smaller drainfield area. The drainfield will be pressure-dosed because the calculated drainfield area

is greater than 1,000 sqft per Circular DEQ-4, Section 4.2.3.3.B. The drainfield design includes a trench width of 3 feet and 4-foot spacing between trenches. A summary of design features for the drainfield is provided in Table 1.

Table 1. Wastewater System Design

Lot Number	Wastewater Flow Rate (gpd)	Application Rate (gpd/sqft)	Calculated Drainfield Size (sqft)	Reduced Drainfield Size (sqft)	Number of Trenches	Trench Length (ft)	Trench Width (ft)
Lot 8	400	0.20	2,000	1,500	6	84	3

The Property will have a dosing tank and pump due to the need for pressure dosing. The dosing system was designed in accordance with Circular DEQ-4, Section 4.2.3.3. A 1,000-gallon dosing tank (Billings Precast DT10 or similar) equipped with Orenco PF5005 or similar pump will be used for the pressure-dosed system. The drainfield and piping sizes are shown with the calculations in Appendix G.

## NONDEGRADATION ANALYSIS

A water sample was collected from a well approximately 0.2 mile south of the site (GWIC ID 238467) on August 21, 2020. Laboratory results indicate a total background nitrogen concentration of 2.0 mg/L (Appendix H). A nondegradation analysis was performed according to ARM 17.30.715 to protect Montana’s high-quality ground and surface waters.

### MIXING ZONE

The mixing zone for the proposed drainfield was sized in accordance with ARM 17.30.517(1)(d)(viii)(A). The standard mixing zone for a single-family septic system drainfield where the individual lots are less than 2 acres is 100 feet long. However, due to site constraints, a 64.5-foot Source Specific Mixing Zone (SSMZ) is proposed. As described in the Nitrate Analysis sections of this report, the nitrate dilution calculations show that the proposed mixing zone meet the DEQ dilution requirements. The mixing zone, a theoretical thickness that the effluent plume will mix in the vertical direction below the water table, was set to 9.675 feet, which was determined by the ratio of length of the SSMZ to a standard mixing zone, then reducing the thickness from 15 feet by that ratio. The ratio of mixing zones was 64.5:100, resulting in a 9.675-foot mixing zone thickness. The mixing zone width was determined to be the total width of the primary drainfield as measured perpendicular to the groundwater flow direction. The width increases down gradient from the drainfield according to ARM 17.30.517(1)(d)(iii)(B), which states that the width of a standard mixing zone is “equal to the width of the source plus the distance determined by the tangent of 5° times the length of the mixing zone on both sides of the source.”

### NITRATE ANALYSIS

A nitrate dilution model was performed for the Property to calculate the nitrate concentration at the end of the mixing zone. The default value for effluent total nitrogen concentration, 50 mg/L, was used for the nitrate analysis as required by DEQ. The background nitrate concentration from the laboratory analysis is 2.0 mg/L (see Appendix H). The

calculated nitrate concentration at the end of the mixing zone was determined to be below DEQ's requirement of 5.0 mg/L as specified in ARM 17.30.715(1)(d)(ii). Nitrate sensitivity analysis calculations are provided in Appendix I. Hydraulic conductivity was calculated from the well logs provided in Appendix E.

### PHOSPHORUS BREAKTHROUGH ANALYSIS

Phosphorus breakthrough was analyzed for the wastewater treatment system. For the analysis to pass, the 50-year breakthrough length from the drainfield cannot intersect a high-quality surface water. Appendix J includes the calculations for the 50-year phosphorus breakthrough length. The calculated length was only 1 foot for more than 50 years of breakthrough time. Since the nearest high-quality water source is much farther away from the drainfield (see next section), the site passes the phosphorus breakthrough analysis per ARM 17.30.715(1)(e).

### NITRATE AND PHOSPHORUS TRIGGER POINT ANALYSIS

The nearest high-quality surface water is Five Mile Creek, which is about 0.4 mile south of the Property at its closest point. Per Appendix T of DEQ's "How to Perform a Nondegradation Analysis," because the nearest high-quality surface water is more than 0.25 mile away from the drainfield and the site has an application rate of 0.2 gpd/sqft, which is less than the required 0.5 gpd/sqft to run trigger analysis, a nitrate trigger analysis is not required. A phosphorus trigger analysis is not required because the 50-year breakthrough criteria is met by the system.

Although there is a canal located 660 feet north of the Property, it is not in the direction of the groundwater gradient, so it is not considered in the analysis.

### SOLID WASTE AVAILABILITY

Solid waste disposal is available to the Property by Republic Services. Solid waste disposal would be conducted at the City of Billings Regional Landfill.

### STORMWATER ANALYSIS

Stormwater will be stored in a retention pond. Circular DEQ-8, Simplified Storm Drainage Plan, was used to quantify the amount of stormwater that needs to be stored. The retention pond is proposed on the drainage point of the lot.

Appendix K includes the stormwater calculations. The required storage volume is 1,281 cubic feet, and the designed volume is 1,333 cubic feet. The designed pond is sufficient to hold the excess site runoff.

### SAGE GROUSE

In response to Senate Bill 261 and Executive Orders 12-2015 and 21-2015, all Sanitarian in Subdivision Act applications and Public Water or Wastewater Plan reviews in counties hosting Greater sage grouse habitat must include a letter of comment from the DNRC Sage Grouse Habitat Conservation Program. Using the program's online mapper located at <http://sagegrouse.mt.gov/projects/>, the Property was determined to be in a General Habitat Management Area. Voluntary recommendations for construction and sustainable use of the land are provided in Appendix L.