

Taunton Group

Community Development

July 1, 2020

Garden City Development Services
Jenah Thornborrow, Director
6015 N. Glenwood St.
Garden City, ID 83714
jthorn@gardencityidaho.org

Glass Island View Subdivision Application SUBFY2020-6

Dear Jenah,

On behalf of the applicant, Glass Creek, LLC, I am submitting information related to the Glass Island View Subdivision Preliminary Plat Application SUBFY2020-6. The subdivision is proposed to include three custom infill residential lots and one common lot on the Plantation Country Club property owned by Glass Creek adjacent to the Boise River.

Glass Creek reviewed the public comments received by the City as of June 10, 2020 and a subsequent late letter. The applicant would like to address comments contained in a letter Jake and Valerie Heusinkveld provided to Glass Creek on June 9, 2020. The Heusinkveld property is located west of the proposed subdivision. Specifically, this letter provides information related to the following comments from the Heusinkvelds:

1. The 6500 cubic feet per second (CFS) line depicting the Ordinary High Water Mark (OHWM) and the 70-foot building setback line from the OHWM are not correct on the mapping included in the application
2. As much as 1,300 cubic yards (CY) have been placed on the property in the designated floodway between 2007 and 2019, raising the elevation a possible 7-9 feet

Before directly addressing these assertions, Glass Creek would like the City to be aware of the following:

1. Glass Creek purchased the property on December 21, 2018 and retained the former owner, American Golf Corp. (AGC), to manage the golf course operation. Glass Creek is not aware of any of the claimed filling and was not provided any information by AGC in this regard.
2. AGC hired a new General Manager in January 2018 and a new golf course Superintendent in March 2018 resulting in a loss of institutional memory regarding operations before 2018. Any information for the period before 2018 is anecdotal.
3. As part of a Settlement Agreement dated August 8, 1989 between the State of Idaho, Fireman's Fund Mortgage Corporation (then owner of the Plantation Country Club

property) and others, Fireman’s Fund quit claimed (on April 5, 1990) any right, title or interest in land below the “normal or ordinary high water mark” to the State. Glass Creek’s ownership boundary reflects that transfer. The boundary extends downslope towards the Boise River from the existing riverbank in the subdivision area and reflects the assumed 6500 CFS line in 1989-1990.

The following information represents preliminary engineering intended to assist with discussions at the public hearings in response to comments from the public. It is not: a revised application; is not a substitute for detailed engineering design and construction drawings to be reviewed by the City and other agencies; and is not detailed engineering analysis required by FEMA, all of which would occur after preliminary plat approval.

6500 CFS Line and 70-Foot Building Setback

In an effort to address the location of the 6500 CFS line and 70-foot building setback from the OHWM required by Garden City Code, Glass Creek requested that The Land Group conduct a field survey on June 12, 2020 along the riverbank and under the tree canopy in the subdivision area to compare to the Existing Conditions Map in the application. The survey determined that the riverbank curves further north at the southwest corner of the site. The Land Group updated the topography shown on the Existing Conditions Map and the FEMA Map Analysis exhibit. Attached to the cover email are the revised map and exhibit dated June 26, 2020.

During the survey, The Land Group identified staining on the trees from high water in previous years and conservatively estimated those marks represent the 6500 CFS. However, the tree staining may represent the peak flow rate in 2019 (7340 CFS) or the 2017 historic flow rate (9590 CFS). Please refer to the attached Glenwood gauge chart for 2008-2019.

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
2008	May 20, 2008	10.56	7,270 ⁶
2009	Jun. 07, 2009	9.84	6,320 ⁶
2010	Jun. 11, 2010	9.72	6,180 ⁶
2011	May 18, 2011	10.07	7,230 ⁶
2012	May 05, 2012	10.93	8,310 ⁶
2013	May 21, 2013	6.39	1,520 ⁶
2014	Mar. 31, 2014	6.91	2,130 ⁶
2015	May 19, 2015	6.42	1,770 ⁶
2016	Apr. 11, 2016	9.98	6,420 ⁶
2017	Jun. 06, 2017	11.93	9,590 ⁶
2018	May 28, 2018	9.71	6,520 ⁶
2019	May 06, 2019	10.01	7,340 ⁶

Peak Gage-Height Qualification Codes.

- 2 -- Gage height not the maximum for the year

Peak Streamflow Qualification Codes.

- 1 -- Discharge is a Maximum Daily Average
- 5 -- Discharge affected to unknown degree by Regulation or Diversion
- 6 -- Discharge affected by Regulation or Diversion

Based on the revised topographic survey and the conservative location of the 6500 CFS line, it appears the 70-foot setback would expand north on Lot 1, remain about the same on Lot 2, and move riverward on Lot 3. However, Glass Creek conducted further survey work on the Heusinkveld's property with the owner on July 1, 2020 to help define the 6500 CFS line. Based on this survey work, Glass Creek will provide the City with an updated preliminary plat map showing any adjustments to the 70-foot building setback line before the Planning & Zoning Commission hearing on July 15, 2020.

Filling in the Floodway

Glass Creek disputes the claim that up to 1,300 CY of fill from organic plugs/cores during aerification of the golf course in Spring and Fall was placed on hole 16 in the floodway. The assertion is based on a comparison of 2007 and 2019 LiDAR mapping.

The sheer amount of material required to produce a fill of 1,300 CY demonstrates that the assertions are not realistic. To put the amount in perspective, a typical dump truck has an average capacity of 10 CY and a concrete truck averages 8 CY. To move 1,300 CY of material to the site would require 130 trips by a dump truck and 162 trips by a concrete truck. Rather, any material moved using golf course equipment involved transporting with a core harvester cart holding 1.25-1.5 CY. It would require 866 loads to move 1,300 CY. Obviously, none of this occurred.



Glass Creek asked The Land Group to calculate the volume of material that theoretically would be removed from five greens (holes 12-16) adjacent the site. These greens are the logical source. The engineers computed the volume of each cylinder plug (1/2-inch diameter X 3-inch depth) multiplied by the grid created on the area of each green from the machine (2-inch X 1/2-inch tine spacing). The theoretic volume result is 13 CY. However, since the plugs are organic material and will fall apart, 10 CY is a more realistic total estimate. If 12 years of plugs were deposited twice a year, the theoretical total amount would be approximately 240 CY, not the 1,300 CY speculated by the Heusinkvelds.

Glass Creek has determined that during its ownership any cores deposited in 2019 were later removed. No cores were deposited in Spring 2020. The amount of material possibly placed in

prior years from aerification of the course is unknown to Glass Creek. However, the Superintendent advised that there are small mounds of soil existing from an irrigation repair in 2019, which can be easily removed.



Glass Creek also doubted the accuracy of comparing the 2007 LiDAR elevation data sets to the 2019 LiDAR data sets. Glass Creek asked SPF Water Engineering to provide a letter report on the accuracy. The report states that the 1,300 CY estimate “does not account for the accuracy limitations of the LiDAR.” Below are the summary points from the report:

- Quadrant Consulting Inc. estimated 1,300 CY of fill based on LiDAR data
- Vertical accuracy of the data was not factored into Quadrant’s estimate
- Accounting for vertical accuracy of the LiDAR, the true estimate is a range between 1,100 CY of cut, and 2,550 CY of fill between 2007 and 2019
- Without a verified ground survey, estimating cut and fill quantities more accurately than the range given above is not possible

The June 30 SPF letter report is attached to the cover email.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "B. taunton".

Bob Taunton, President
Taunton Group, LLC
2724 S. Palmatier Way
Boise ID 83716
208-401-5505
bobtaunton@tauntongroup.com

June 30, 2020

Bob Taunton
President – Taunton Group
Sent via email to bobtaunton@tauntongroup.com

Subject: Incorporating accuracy statistics when attempting to quantify cut & fill volumes based on LiDAR data.

Dear Bob,

This letter was drafted in response to a land-owner's assertion that fill has been placed by the Plantation Golf Course near their property on the north bank of the Lower Boise River in Garden City, Idaho. The claim, as I understand it, is that Plantation Golf Course has reportedly used this area as a disposal site for turf aeration plugs for several years, which over time has led to gradual in-filling of the area.

Documentation provided to me contains an estimate of fill by Quadrant Consulting Inc. estimating 1300 cubic yards of fill has been placed in the area by comparing two LiDAR (Light Detection And Ranging) elevation data sets, one from 2007 and the other from 2019. This estimate does not account for the accuracy limitations of the LiDAR.

This letter makes no assertions or claims regarding whether fill was or was not placed in the area. Rather the purpose of this letter is to outline and discuss the importance of incorporating the reported accuracy of the LiDAR data and argue that these accuracies must be considered when using LiDAR data to determine whether or not any fill was placed in the area.

- Quadrant Consulting Inc. estimated 1,300 cubic yards of fill based on LiDAR data
- Vertical accuracy of the data was not factored into their estimate
- Accounting for vertical accuracy of the LiDAR, the true estimate is a range between 1,100 cubic yards of cut, and 2,550 cubic yards of fill between 2007 and 2019
- Without a verified ground survey, estimating cut and fill quantities more accurately than the range given above is not possible

The site of interest is located on the north bank of the lower Boise approximately 0.90 miles upstream of the Glenwood Road Bridge. The area encompassing the bank is heavily vegetated with naturally occurring underbrush, trees, and woody debris. This is based on a review of aerial imagery as well as photos included in the complaint.

It is important to first discuss how LiDAR data are collected and the specific challenges vegetation presents to accurate data collection. LiDAR uses lasers which beam downward and upon striking an object, are reflected back up to the sensor resulting in a cloud of points. The points are indiscriminate, bouncing off of everything (water, ground, leaves, roofs, branches, etc.). This point cloud must then be processed to achieve a representation of “bare earth”. LiDAR collection companies have invested heavily in technologies to process the point cloud data, but there is no perfect method. To assess the vertical and horizontal accuracy of the LiDAR survey, locations on the ground are surveyed with more accurate methods and compared to the LiDAR elevation data.

Areas of heavy vegetation present a challenge to LiDAR accuracy due to bare ground being obscured. The information below summarizes the reported vertical accuracy in vegetated areas of both data sets.

Reported 2019 LiDAR vertical accuracy (Hyde, S.J., 2020):

Lidar Vegetated Vertical Accuracies

QSI also assessed vertical accuracy using Vegetated Vertical Accuracy (VVA) reporting. VVA compares known ground check point data collected over vegetated surfaces using land class descriptions to the triangulated ground surface generated by the ground classified lidar points. VVA is evaluated at the 95th percentile (Table 14, Figure 13).

Table 14: Vegetated Vertical Accuracy for the Boise River Flood Control District #10 Project

Vegetated Vertical Accuracy (VVA)	
Sample	9 points
Average Dz	0.253 ft 0.077 m
Median	0.230 ft 0.070 m
RMSE	0.306 ft 0.093 m
Standard Deviation (1σ)	0.182 ft 0.056 m
95 th Percentile	0.545 ft 0.166 m

The Root Mean Squared Error (RMSE) in vegetated areas is 0.306 ft (3.67 inches).

Accuracy reported by the USGS for the 2007 LiDAR (Skinner, K.D., 2009):

Ground-survey area	Trees absent				Trees present			
	Root Mean Square Error (m)				Root Mean Square Error (m)			
	1	2	3	Combined	1	2	3	Combined
Channel	0.292	0.400	0.571	0.440	0.149	0.442	n.d.	0.361
Bank	0.199	0.637	0.289	0.371	0.327	0.333	0.184	0.325
Floodplain	0.184	0.090	0.158	0.159	0.496	0.190	0.201	0.433
Grid	0.138	0.106	0.082	0.111	n/a	n/a	n/a	n/a

Ground survey area	Mean Signed Error (m)				Mean Signed Error (m)			
	1	2	3	Combined	1	2	3	Combined
	Channel	-0.041	0.071	0.447	0.008	0.105	0.231	n.d.
Bank	-0.134	-0.076	-0.112	-0.109	-0.203	-0.082	-0.080	-0.116
Floodplain	-0.088	-0.002	-0.013	-0.024	-0.382	0.073	-0.063	-0.262
Grid	-0.095	0.008	-0.017	-0.035	n/a	n/a	n/a	n/a

Ground survey area	Number of Comparisons (n)				Number of Comparisons (n)			
	1	2	3	Combined	1	2	3	Combined
	Channel	94	73	95	262	6	10	0
Bank	15	14	42	71	25	60	5	90
Floodplain	12	4	67	83	44	14	3	61
Grid	100	100	100	300	n/a	n/a	n/a	n/a

Ground-survey area #2 was used in the figure above as the basis of comparison. This area is located nearest our area of interest on the north channel of Eagle Island just downstream of Eagle Road. The Root Mean Square Error for banks with trees present is 0.333 m (1.09 ft or 13 inches).

The vertical accuracy of the data sets must be taken into account when attempting to quantify fill. When we incorporate the RMSE of each data set into the comparison we create a range of volumes. We tried to match Quadrant’s area of comparison (figure below). Note that not all of the area is vegetated but a more precise analysis was not possible at the time. We can say the volume change over time lies somewhere between 1,100 cubic yards of cut and 2,550 cubic yards of net fill between 2007 and 2019.

	Net Change (cu.yds)
Upper Limit Estimate	2,550 (Fill)
Unadjusted Estimate	790 (Fill)
Lower Limit Estimate	1,100 (Cut)



Please feel free to contact me if you have any questions.

Sincerely,

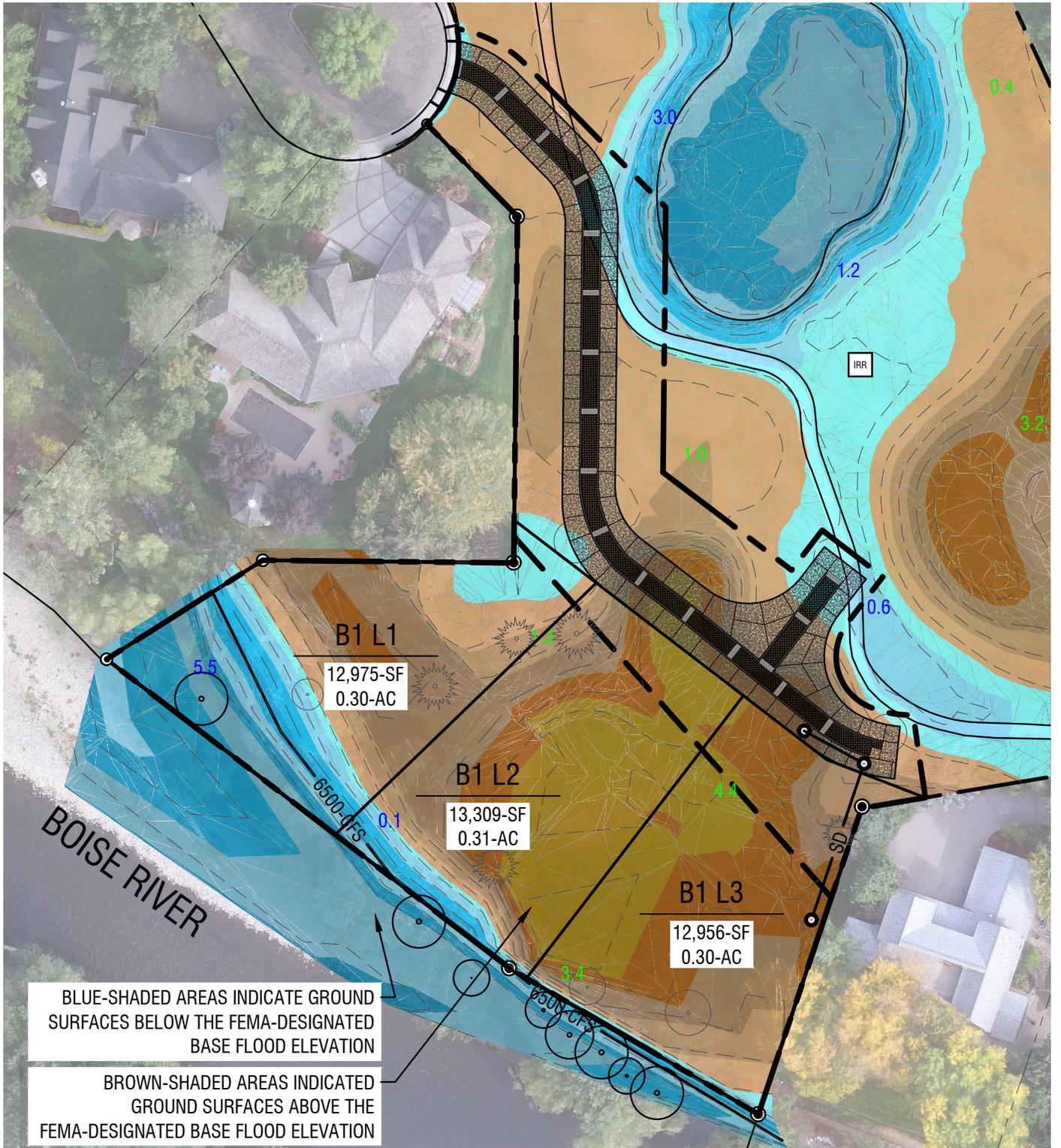
Ron Manning, M.S., P.E., C.F.M.
SPF Water Engineering, LLC.

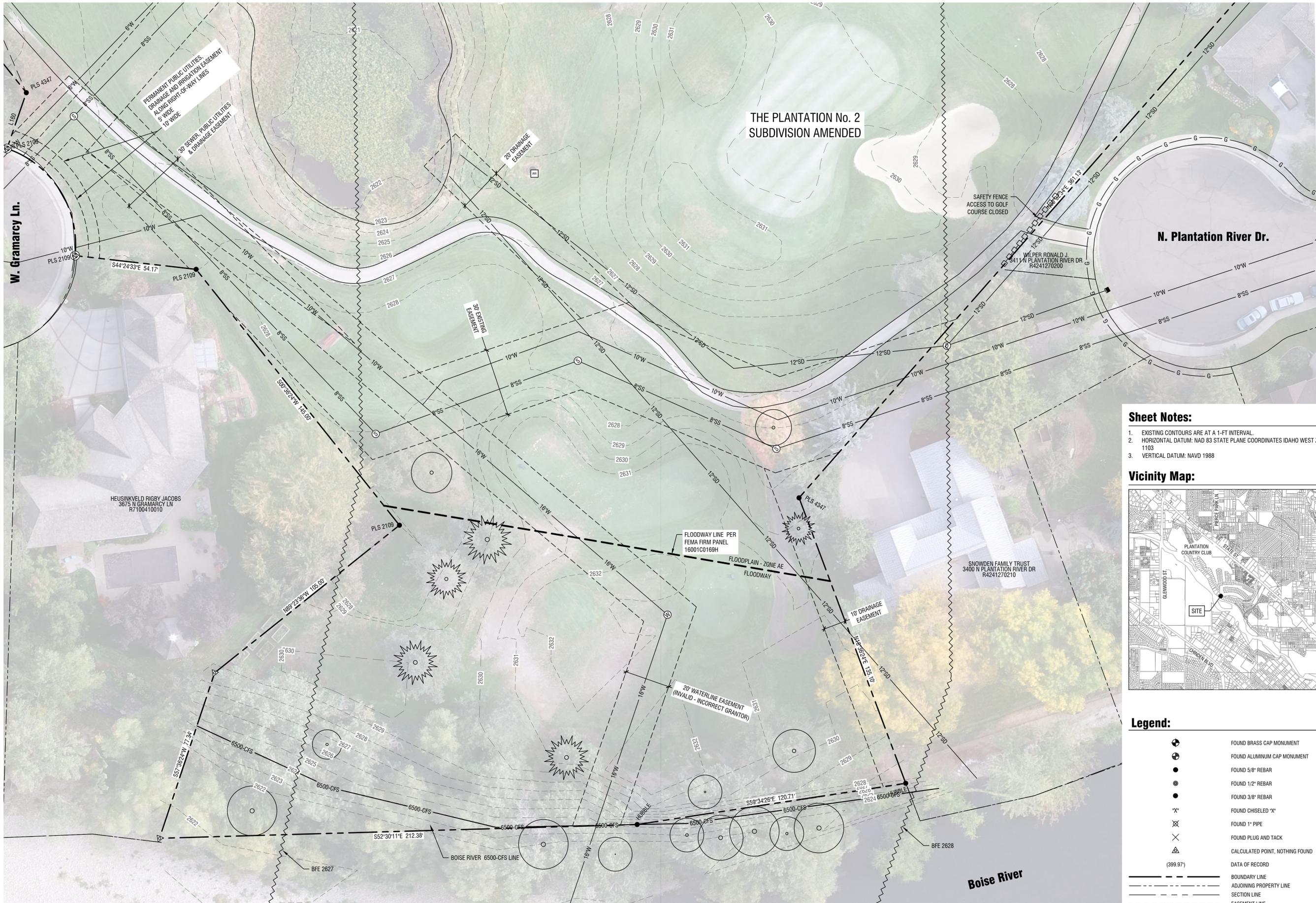


References

Skinner, K.D., 2009, Evaluation of LiDAR-acquired bathymetric and topographic data accuracy in various hydrogeomorphic settings in the lower Boise River, southwestern Idaho, 2007: U.S. Geological Survey Scientific Investigations Report 2009-5260, 12 p.

Hyde, S.J., 2020, Topobathymetric Lidar Technical Data Report – Boise River Flood Control District #10, Idaho, 2019: Quantum Spatial Inc.

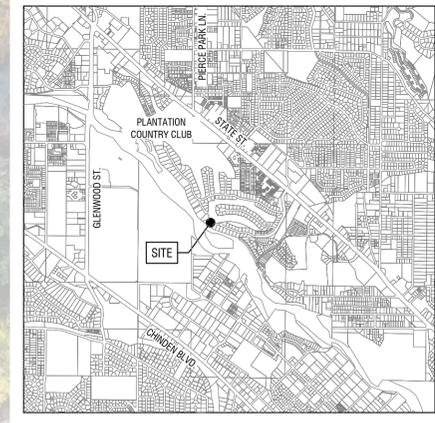




Sheet Notes:

- EXISTING CONTOURS ARE AT A 1-FT INTERVAL.
- HORIZONTAL DATUM: NAD 83 STATE PLANE COORDINATES IDAHO WEST ZONE 1103
- VERTICAL DATUM: NAVD 1988

Vicinity Map:



Legend:

	FOUND BRASS CAP MONUMENT
	FOUND ALUMINUM CAP MONUMENT
	FOUND 5/8" REBAR
	FOUND 1/2" REBAR
	FOUND 3/8" REBAR
	FOUND CHISELED "X"
	FOUND 1" PIPE
	FOUND PLUG AND TACK
	CALCULATED POINT, NOTHING FOUND
	DATA OF RECORD
	BOUNDARY LINE
	ADJOINING PROPERTY LINE
	SECTION LINE
	EASEMENT LINE
	GROUND CONTOUR (1-FT INTERVAL)

**GLASS ISLAND VIEW SUBDIVISION
PRELIMINARY PLAT**

N. PLANTATION RIVER DR.
GARDEN CITY, IDAHO

Revisions

1.	



Project No.: 118161
Date of Issuance: 06-26-2020
Project Milestone: PRELIMINARY PLAT

**Existing Conditions -
Topographic Survey -
Project Area**

PLAT NO. 2020-0111 (PLAT), APPROVED BY THE BOARD OF COUNTY COMMISSIONERS OF GARDEN CITY, IDAHO, ON 06/26/2020. THE PLAT IS SUBJECT TO THE IDAHO CONVEYANCE ACT.