

ROLLING HILLS BOOSTER PUMP STATION SMALL SUBDIVISION DRAINAGE REPORT

(THE HILLS AT LORSON RANCH FILING NO. 1)

PCD FILE NO. PPR-21-075



PREPARED BY

Rich Gallegos, P.E., CFM
RESPEC
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Colorado Springs, CO 80903

PREPARED FOR

Widefield Water and Sanitation District
8495 Fontaine Boulevard
Colorado Springs, CO 80925

JUNE 2022



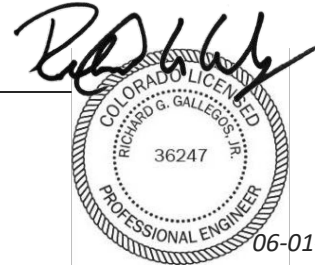


ENGINEER'S STATEMENT

The attached drainage letter plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to criteria established by the City/County for drainage reports, and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

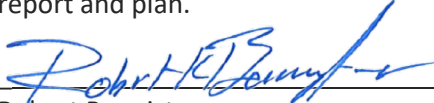
Richard Gallegos, P.E., CFM
Registered Professional Engineer State of Colorado No. 36247

Date



DEVELOPER'S STATEMENT

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.


Robert Bannister
Widefield Water and Sanitation District
8490 Fontaine Boulevard
Colorado Springs, CO 80925

6/3/2022

Date

EL PASO COUNTY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual, and Land Development Code as amended.

Jennifer Irvine, P.E.
County Engineer/ECM Administrator

Date

Conditions:



On behalf of the Widefield Water and Sanitation District, RESPEC Engineering is submitting this Small Subdivision Drainage Report to support the development of the Rolling Hills Booster Pump station.

1. GENERAL PROPERTY DESCRIPTION WITH ACREAGE

The 0.707-acre site is located within the larger Lorson Ranch Master Planned Community east of Marksheffel Road and Fontaine Boulevard. More specifically, the pump station is northeast of the intersection of Grayling Drive and Yellowthroat Terrace.

Two County-approved Drainage Reports were found within the County's files that include the project site:

- *Final Drainage Plan (SSF 21-010) The Hills at Lorson Ranch Filing 1* (Lorson Ranch FDR), by Core Engineering Group, revised March 23, 2021, and approved on August 24, 2021, by the County.
- *Preliminary Drainage Plan (PUDSP 21-002) Skyline at Lorson Ranch*, by Core Engineering Group, revised May 2021 and approved on February 1, 2022, by the County.

Each report provides an existing and proposed condition analysis. The reports also conform to the Drainage Basin Planning Study for Jimmy Camp Creek. Based upon the approval dates listed, the *Preliminary Drainage Plan (PUDSP 21-002) Skyline at Lorson Ranch* has been used as the guiding document for this analysis.

Pertinent excerpts from the Lorson Ranch PDR report are attached to this Small Subdivision Drainage Report.

2. GENERAL EXISTING DRAINAGE CHARACTERISTICS

The site drains to the south toward Grayling Drive with average slopes of 2%-3%. Currently, underground water lines and appurtenances exist on the site. They shall be extended to a new booster pump housing, which is part of a more extensive regional potable water distribution system.

The Skyline at Lorson Ranch PDR included the site as part of the existing conditions analysis within Drainage Area C5.2-ex; see attached Skyline at Lorson Ranch PDR Existing Drainage Area Map. C5.2-ex totals 13.32 acres with peak runoff rates of 3.2 cfs for the 5-year storm event and 21.8 cfs for the 100-year storm event. Flows travel overland and eventually to Jimmy Camp Creek, located to the west.

The site is located in an Unshaded Zone X (areas outside of the 500-year floodplain) flood hazard area per the Federal Emergency Management Agency's Flood Insurance Rate Map panel 08041C0976G, effective date December 7, 2018. See attached floodplain exhibit.

3. GENERAL PROPOSED DRAINAGE CHARACTERISTICS

The site is split between two proposed drainage areas in the Skyline at Lorson Ranch PDR.

The majority of the improvements will be located in Drainage Area C10.8. Per the PDR, basin C10.8 totals 1.89-acres and generates peak runoff rates of 3.4 cfs for the 5-year storm event and 7.4 cfs for the 100-year storm event. In addition, the drainage area includes portions of a future single-family development located to the north. Runoff rates are based upon a land-use of 1/8 acre single-family lots, with an assumed percent impervious cover of 65%.

The easternmost portion of the site is located in Drainage Area C10.9, which is 3.73-acres in size and will be comprised of future single-family lots, the pump station site, and an easement for overhead electrical lines. Peak runoff rates for the drainage area are listed as 5.9 cfs for the 5-year storm event and 13.0 cfs for the 100-year storm event in the Skyline at Lorson Ranch PDR. Land use for this area is assumed to be predominately 1/8 acre single-family lots with 65% impervious cover.

Runoff from both drainage areas listed above is designed to surface flow to Grayling Drive. Based upon the Skyline at Lorson Ranch PDR, flows from both drainage areas will be collected by a 25' Type R inlet and conveyed to existing Detention Pond C3 via public 30" and 48" RCP storm sewers. Detention Basin C3 has sufficient detention and water quality capacity to develop the Rolling Hills Booster Pump Station.

4. HYDROLOGICAL CALCULATIONS

For this drainage analysis, we have completed two evaluations. The first is to compute the overall percent of impervious cover to verify that the proposed land use complies with the assumptions outlined in the Skyline at Lorson Ranch PDR. The second is to establish the flow rates within the site to size two sidewalk chases properly.

Compliance with the Skyline at Lorson Ranch PDR:

As part of the analysis of the proposed conditions completed for Lorson Ranch, the assumptions for the two drainage areas (C10.8 and C10.9) were reviewed. Both areas assume a hydrologic soil type "B" and a maximum percent impervious of 65%. The overall percent impervious calculation for the Rolling Hills Booster Pump Station as designed was completed to verify that the proposed development complies with the PDR analysis.

- Total Acreage: 0.707-acres
 - Total area of pavement/building: 0.07-acres @ 100% Impervious
 - Total area of Gravel Drive/Rock Landscaping: 0.39-acres @ 80% Impervious
 - Total area of vegetated area: 0.25-ac @ 0% Impervious
- Computed Site Percent Impervious: 54%
- Maximum Allowable Percent Impervious: 65%

The site as designed has an overall percent impervious of 54%, which is less than the maximum allowed by the Skyline at Lorson Ranch PDR of 65%; therefore, the land use design complies with the approved master drainage plan. Sufficient stormwater mitigation capacity and water quality exist within Detention Pond C3.



Sidewalk Chase Calculations:

Two drainage areas were delineated to compute flows directed to two sidewalk chases. Each area considers the proposed grades for the Future Lorson Ranch development, which is imminent. The Rational Method was used to determine the peak 5-year and 100-year flows and utilize the same assumptions given within the Skyline at Lorson Ranch PDR.

The 5-year, $C(5) = 0.45$, and 100-year, $C(100) = 0.59$, runoff coefficients as those given in the PDR are used to compute peak flow rates. The drainage areas delineated specifically for this analysis also are contained within the larger PDR drainage delineations given within the County approved report.

Drainage Area PR1 consists of 0.29-acres of area on the western portion of the project limits. The drainage area extends offsite and will accept minor sheet flow from the adjacent single-family development. Computed peak flow rates of $Q(5) = 0.7$ cfs and $Q(100) = 1.5$ cfs will surface flow to a 2' wide sidewalk chase and into Grayling Drive at a minimum 2% grade to accommodate the 100-year peak flow rate and remain in compliance with the recommendations given in the Skyline at Lorson Ranch drainage report. The concrete chase will be extended past the sidewalk to the curb and gutter in Grayling Drive at a 45-degree angle. The sidewalk chase will be installed when ROW sidewalk and landscaping improvements are installed to maintain proper drainage patterns. A license agreement for the construction and maintenance of the sidewalk chase may be required and will be addressed with the final construction document approval.

Drainage Area PR2 is 0.56-acres in size, encompassing the east side of the project site. Flows from this drainage area include adjacent single-family lots and open space in the Future Lorson Ranch development area. Peak flow rates of $Q(5) = 1.2$ cfs and $Q(100) = 2.4$ cfs were computed PR2. A proposed 2' wide concrete sidewalk chase at a 2% flowline grade will convey flows to Grayling Drive to accommodate the 100-year peak flow rate and remain in compliance with the recommendations given in the Skyline at Lorson Ranch drainage report. The concrete chase will be extended past the sidewalk to the curb and gutter in Grayling Drive at a 45-degree angle. The sidewalk chase will be installed when ROW sidewalk and landscaping improvements are installed to maintain proper drainage patterns. A license agreement for the construction and maintenance of the sidewalk chase may be required and will be addressed with the final construction document approval.

5. DRAINAGE FEES

The site is located within an existing easement and will not be platted at this time. Drainage fees will be required when Skyline at Lorson Ranch Filling #1 is platted and will include the area. Per previous agreements with the Lorson Ranch Metro District, the Metro District will compile and submit to the County on a yearly basis the Drainage and Bridge fees for the approved plat and shall show all credits they have received for the same annual timeframe.



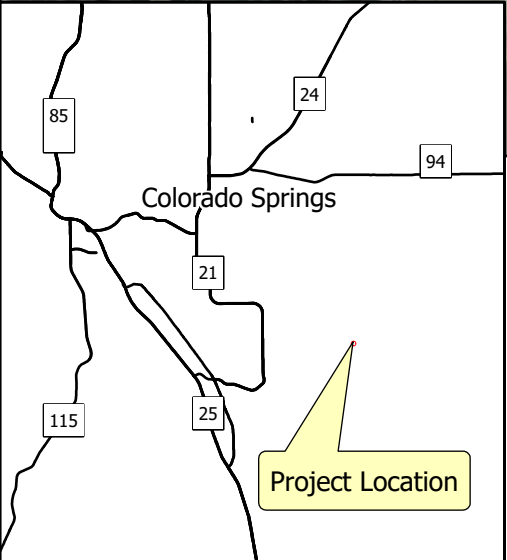
Project Location

Fontaine Blvd

lvd

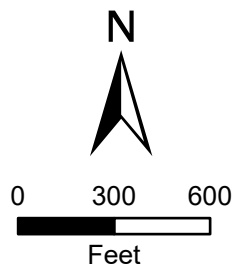
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Colorado Springs

Project Location



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ROLLING HILLS BOOSTER PUMP STATION

VICINITY MAP

Job No.: Date: December 2021 By: RLM



Project Location

Zone AE (100-year studied floodplain)

Ivd

Fontaine Blvd

NFP

PANEL 0976G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO
AND INCORPORATED AREAS

PANEL 976 OF 1300
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS CITY OF	080090	0976	G
EL PASO COUNTY	080059	0976	G

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0976G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

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0 300 600

Feet

Prepared by:

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ROLLING HILLS BOOSTER PUMP STATION





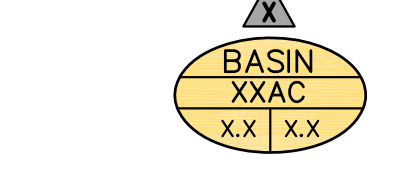


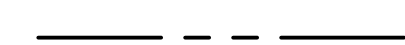



FLOOD INSURANCE RATE MAP

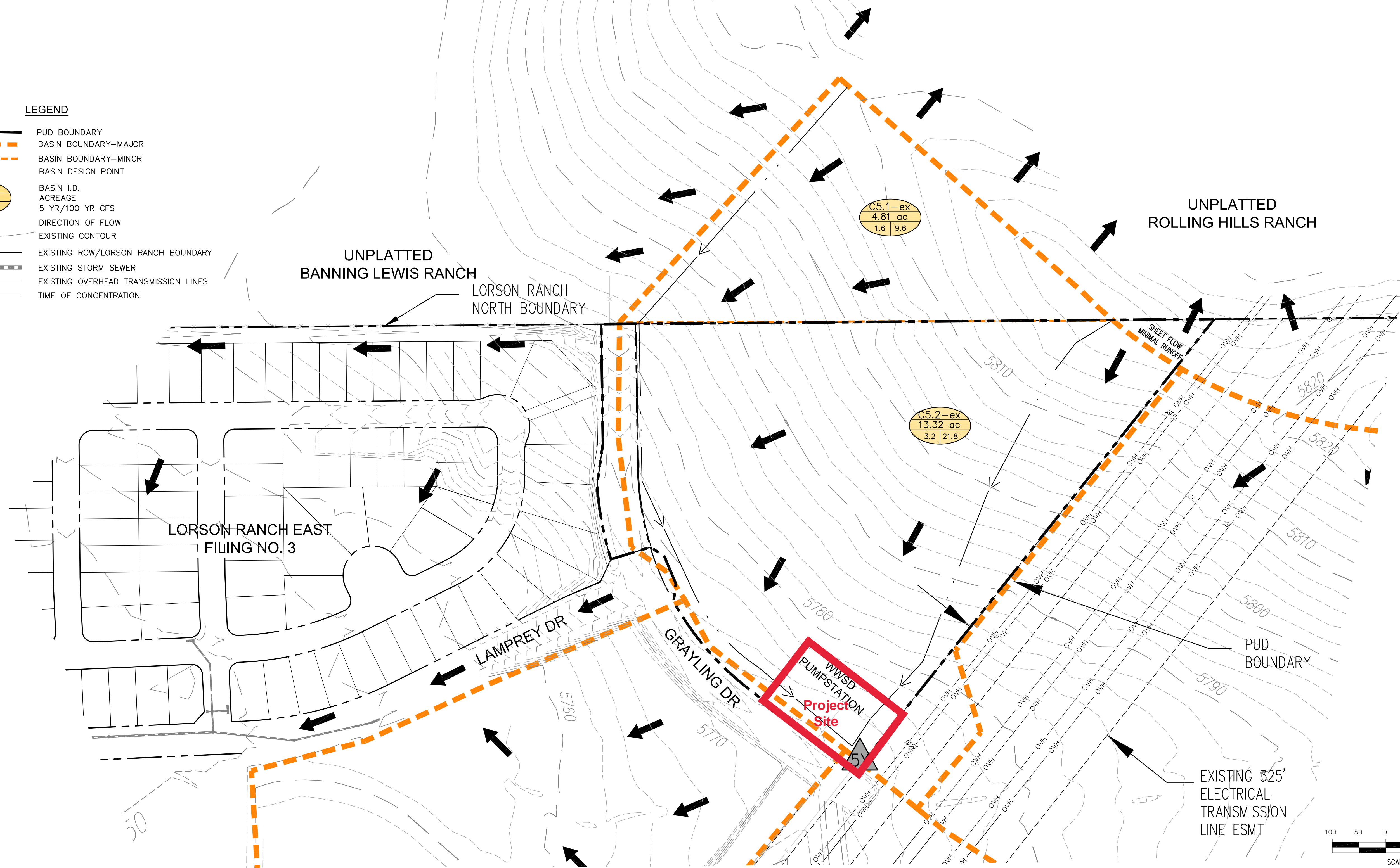
Job No.:	Date: December 2021	By: RLM
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DESIGN POINT SUMMARY TABLE					
DESIGN POINT	Basin	DRAINAGE AREA (AC)	RUNOFF 5 YR (CFS)	RUNOFF 100 YR (CFS)	COMMENT
5X	C5-ex	18.13	4.2cfs	27.2cfs	EX. FLOW

LEGEND

-  PUD BOUNDARY
-  BASIN BOUNDARY-MAJOR
-  BASIN BOUNDARY-MINOR
-  BASIN DESIGN POINT
-  BASIN I.D. ACREAGE 5 YR/100 YR CFS
-  DIRECTION OF FLOW
-  EXISTING CONTOUR
-  EXISTING ROW/LORSON RANCH BOUNDARY
-  EXISTING STORM SEWER
-  EXISTING OVERHEAD TRANSMISSION LINES
-  TIME OF CONCENTRATION

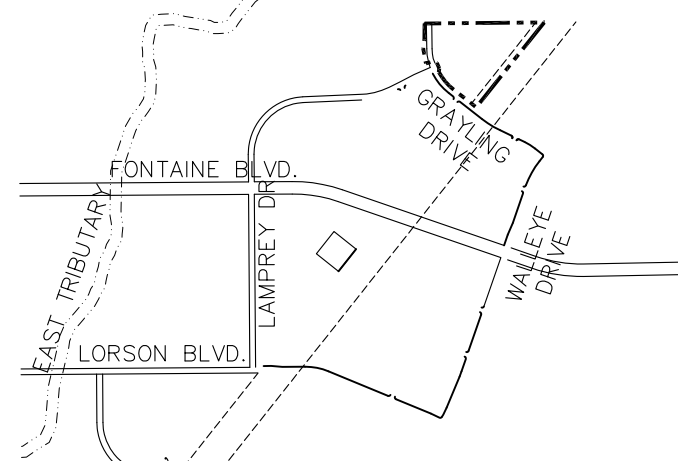


**EXISTING CONDITIONS
 PUD / PRELIMINARY PLAN
 SKYLINE AT LORSON RANCH**

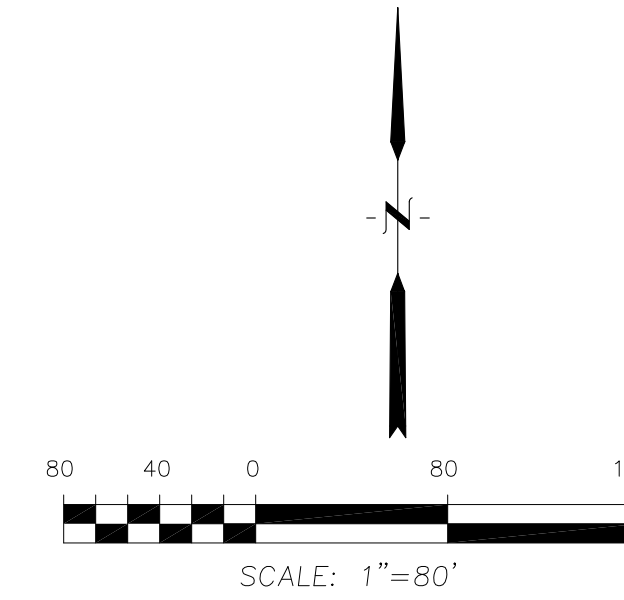
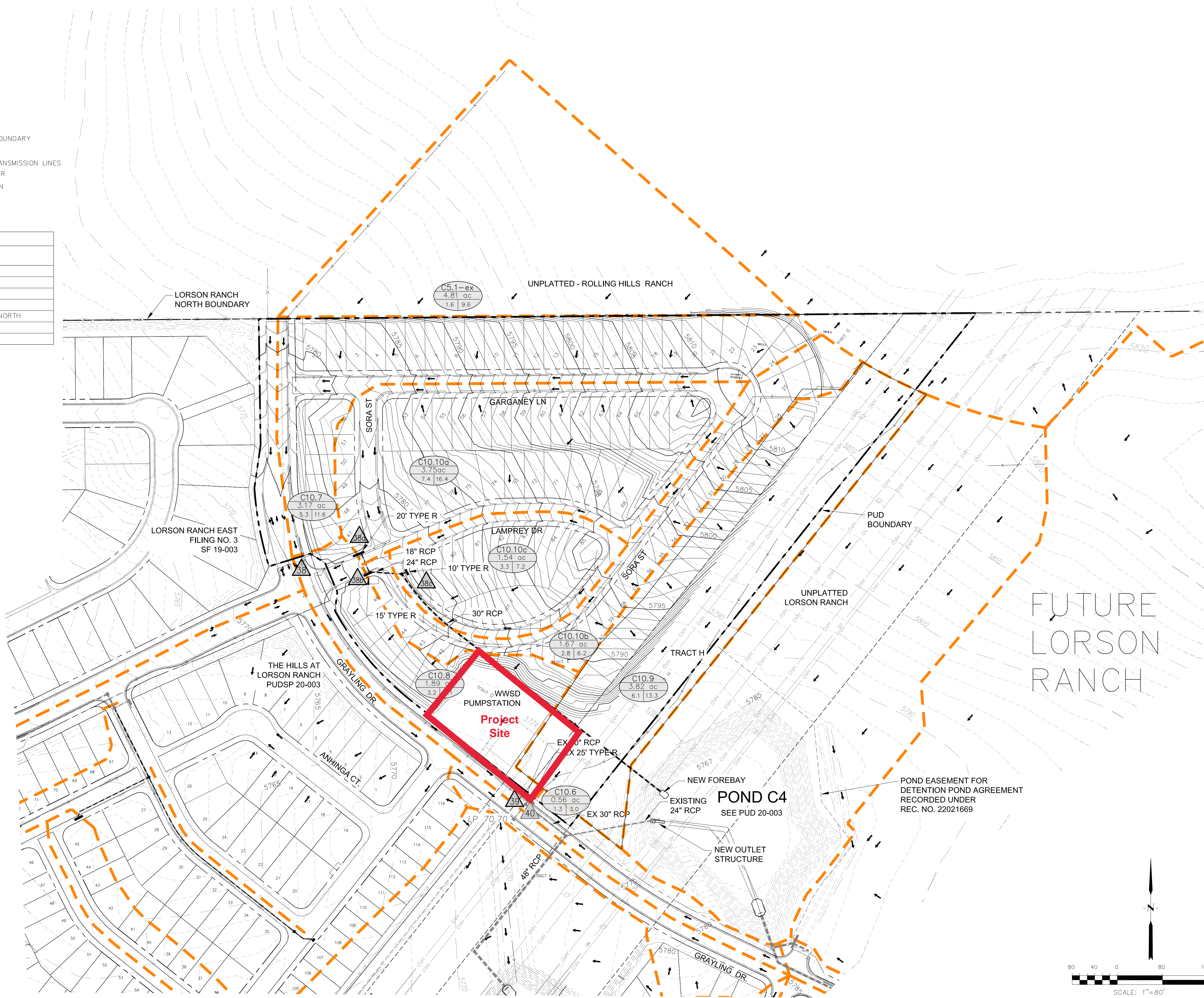
LEGEND

- PUD BOUNDARY
- BASIN BOUNDARY
- BASIN DESIGN POINT
- BASIN I.D.
XX AC
5 YR/100 YR CFS
- DIRECTION OF FLOW
- EXISTING CONTOUR
- PROPOSED CONTOUR
- ROW/LORSON RANCH BOUNDARY
- EXISTING STORM SEWER
- EXISTING OVERHEAD TRANSMISSION LINES
- PROPOSED STORM SEWER
- TIME OF CONCENTRATION
- HIGH POINT
- LOW POINT

RUNOFF SUMMARY				
D.P.	AREA (acres)	5 YEAR cfs	100 YEAR cfs	NOTES
38	7.98 ac	6.8	22.1	STREET FLOW
38a	3.75 ac	7.4	16.4	STREET FLOW
38b	5.42 ac	2.8	6.2	STREET FLOW
38c	6.96 ac	3.3	7.2	STREET FLOW
39	9.87 ac	8.5	25.1	STREET FLOW FROM NORTH
40	14.25 ac	14.7	38.7	STREET FLOW



VICINITY MAP
NO SCALE



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212 N. WAHSAUCH AVE. SUITE 301
COLORADO SPRINGS, COLORADO 80903
CONTACT: JEFF MARK

DRAWN: RLS
DESIGNED: LAB
CHECKED: LAB

**DEVELOPED CONDITIONS
SKYLINE AT LORSON RANCH
C10 BASIN**

DATE: MAY 20, 2021

PROJECT NO.: 100.063

SHEET NUMBER: 1

TOTAL SHEETS: 1