

Please discuss DP1 and compare the runoff leaving the site under existing and proposed conditions.

Review C1: State what flow increases are at each location.

Review C2: Unresolved. Please provide comparison of existing and proposed inflow into Pond B. And also, discuss whether the pond B has capacity to handle the increase. Please reassess the capacity of Pond B.

flows from Basins OA1, OA2, A1, A5, A6 southeasterly to PLD-B.

Flows from Basins OA1-OA2, A1, A5, A6, OB1-OB2, and B1-B6 will continue to flow into PLD-B at Design Point #B6.1, with developed peak flows of $Q_5 = 67.2$ cfs and $Q_{100} = 305.2$ cfs (SCS Method). In the event of an overflow of PLD-B, overflows would drain southeasterly across the existing broad, grass-lined overflow swale (designated as "Overflow") flowing southeasterly across Basin B7 to Design Point #2.

JPS Response: In response to the County Stormwater Review Comments on Round #1 (see attached), we are no longer modeling "PLD-A" and "PLD-B" as ponds, so the pond discussion is no longer relevant to this FDR

A5, A6, OB1, and OB2 will continue to combine with on-site Design Point #2, with developed peak flows of $Q_5 = 71.2$ cfs (SCS Method). The developed flow impact at Design Point #2 is a flow increase calculated based on the large size of the off-site (comparison to the relatively small rural subdivision area).

Silverado Ranch Filing No. 2 will not have any developed drainage impact within Basins A, B, or C. The proposed runoff from the minor storm is significantly higher than the existing runoff at DP2. Additionally, since the runoff from DP2 is concentrated, it will adversely impact downstream areas.

C. Stormwater Detention / Water Quality / Porous Landscape Detention (PLD) Areas

Developed runoff impacts from the project will be mitigated by preservation of the two existing PLD areas within the site. While previous drainage reports for this subdivision identified the existing PLD's as "Retention Ponds," these PLD areas are now being discussed and modeled as "Porous Landscape Detention" Areas. The existing PLD areas are natural, historic topographic depressions, and the PLD areas do not have embankments or outlet structures. Given that there are no existing embankments, our understanding is that there are no water rights issues associated with preservation of these natural depression areas, which are common in eastern El Paso County.

Stormwater retention storage capacity was evaluated in detail in the previously approved 2018 "Final Drainage Report for Silverado Ranch Filing No. 1" (see excerpts in Appendix A). As discussed in the previous report, the existing PLD areas will be protected and preserved to the greatest extent possible, matching historic drainage conditions. As previously noted, the existing northwest PLD (PLD-A) has a storage volume of approximately 36.5 acre-feet between the 5845 and 5857 contours. The easterly PLD (PLD-B) has a storage volume of approximately 74.3 acre-feet between the 5790 and 5796 contours. The previous FDR included infiltration calculations projecting a drain time of 23.9 hours for PLD-A and a drain time of 14 hours for PLD-B.

Please specify which storm event these drain times refer to.

As discussed above, there will be a negligible increase in developed flows due to the rural residential nature of the development and the large upstream drainage basin areas in comparison to the subdivision area. As such, there is no need for stormwater detention for this subdivision. While the previous subdivision drainage report included recommendations for improvements to the existing "retention" areas during future phases of the project, no improvements to the existing PLD's are recommended based on the analysis in this report.

What is the function of the pond? Was it designed for full infiltration, partial infiltration, or detention purposes? Please provide a clear description. Additional comments can be found in the excerpts.

Please see comment on the drainage map for pond improvement to meet the current criteria.

Unless official Runoff Reduction calcs are provided to prove it, the grass ditches cannot count as providing water quality treatment. Please re-word this accordingly. I believe that the intent is for the PLDs to provide the WQ treatment for the roadway improvements.

Retention Ponds have permanent pools. Ponds A & B are actually full-infiltration PLD facilities.

- Water quality mitigation for the roadway improvements will be provided by grass-lined roadside ditches flowing to the existing grass-lined Retention Ponds within the subdivision.

Step 4: Consider Need for Industrial and Commercial BMPs

- No industrial or commercial land uses are proposed as part of this development.

V. GENERAL DRAINAGE RECOMMENDATIONS

For Reference:
County
Stormwater
Comments from
Review #1

The plan for the site is to provide and maintain positive drainage away from the site to the established drainage patterns for the overall subdivision. JPS requires that positive drainage be established and maintained away from all buildings on the site in conformance with applicable building codes and geotechnical recommendations.

Individual lot grading and drainage is the sole responsibility of the individual builders and property owners. Final grading of each home site should establish proper protective slopes and positive drainage in accordance with HUD guidelines and building codes. In general, main floor elevations for each home should be established a minimum of 2 feet above the top of curb (or pavement) of the adjoining street.

We recommend a minimum of 6 inches clearance from the top of concrete foundation walls to adjacent finished site grades. Positive drainage slopes should be maintained away from all structures, with a minimum recommended slope of 5 percent for the first 10 feet away from buildings in landscaped areas, a minimum recommended slope of 2 percent for the first 10 feet away from buildings in paved areas, and a minimum slope of 1 percent for paved areas beyond buildings.

VI. DRAINAGE FACILITY DESIGN

A. General Concept

Development of Silverado Ranch Filing No. 2 will include site grading and roadway construction, resulting in additional impervious areas across the site. The general drainage pattern will consist of grading away from home sites to swales and roadside ditches along the internal roads within the subdivision, conveying runoff flows through the site. Runoff from the site will flow by roadside ditches to cross culverts at low points in the road profiles, and grass-lined channels connecting to existing natural swales at the site boundaries.

The stormwater management concept for Silverado Ranch Filing No. 2 will be to provide roadside ditches and natural swales as required to convey developed drainage through the site to existing natural drainage channel outfalls. Individual lot grading will provide positive drainage away from building sites, and direct developed flows into the system of roadside ditches and drainage swales running through the subdivision.

Review C1: Please provide excerpts that include text, calculations, and a map showing that this site accounts for the two existing retention ponds. Also, please show that two ponds are functioning and meet the current design criteria. Please highlight the relevant information.

Review C2: Unresolved. Please provide more information of the excerpt. Excerpt of pond capacity is required which is DP 6.

C. Comparison of Developed to Historic Discharges

Based on the hydrologic calculations in Appendix B, the proposed development will result in increased peak discharges at key points, although the increased peak discharges are offset by the increased drainage areas. **JPS Response: In response to the County Stormwater Review Comments on Round #1, we are no longer modeling "PLD-A" and "PLD-B" as ponds, so the pond discussion is not relevant to this FDR**

Design Point	Historic Flow			Developed Flow			Comparison of Developed to Historic Flow (Q ₁₀₀)
	Area (ac)	Q ₅ (cfs)	Q ₁₀₀ (cfs)	Area (ac)	Q ₅ (cfs)	Q ₁₀₀ (cfs)	
1	56.3	23.9	60.1	47.4	27.4	64.1	107% (increase + 4.0 cfs)
2	5755	0	355.6	5754	12.1	342.2	96% (decrease - 13.4 cfs)

Based on the large size of the off-site basins impacting this site in comparison to the rural nature of the proposed development, developed flow impacts from the project will be minimal. The developed drainage impacts will be attenuated through preservation of the existing on-site stormwater retention ponds.

D. Retention Ponds

Developed runoff impacts from the project will be mitigated by preservation of two existing stormwater retention ponds within the site. The existing retention ponds provide sufficient volume to meet stormwater detention requirements, mitigating developed drainage impacts from the subdivision.

Stormwater retention storage capacity has been evaluated at each of the existing retention ponds based on Denver Urban Drainage and Flood Control District (UDFCD) design criteria. The UDFCD criteria require stormwater retention ponds to have a storage volume of 1.5 times the 24-hour, 100-year volume. Detention volume sizing parameters are summarized as follows (see details in Appendix D):

Pond	Required 100-Year Retention Volume (ac-ft)	Existing Storage Volume w/ 1' freeboard (ac-ft)
A (DP-A1)	162.3	28.9
B (DP2)	352.5	57.8

As indicated in the table above, based on the large off-site drainage areas flowing into the site, Ponds A and B do not have sufficient capacity to meet the recommended stormwater retention volume, and as such both ponds would be anticipated to overtop during major storm events. Based

APPENDIX D

**RETENTION POND CALCULATIONS AND
OPERATION & MAINTENANCE MANUAL**

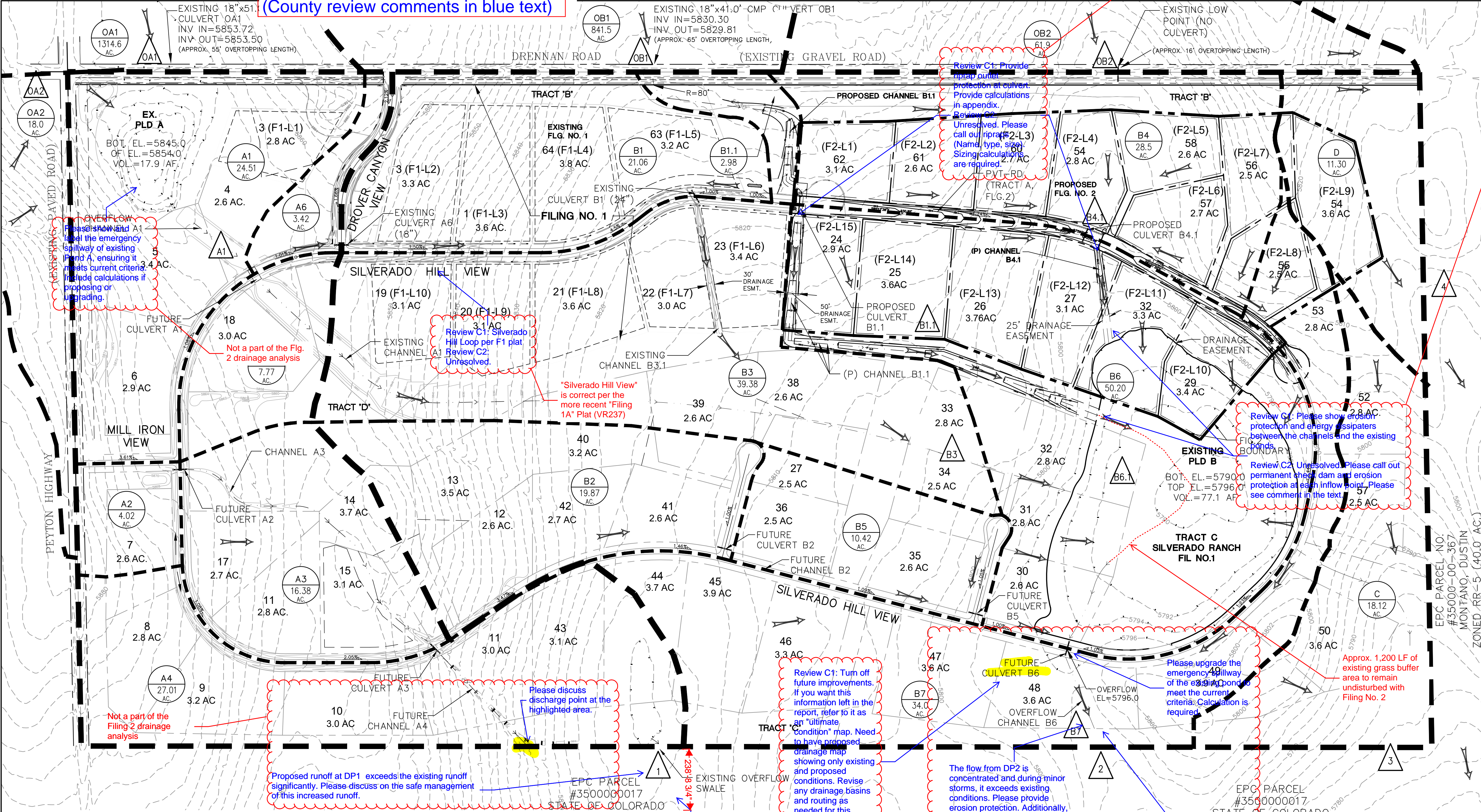
It appears that this excerpt is insufficient for an infiltration pond calculation. The excerpt mentions that this pond is temporary and not recommended as a permanent structure. Furthermore, the geotechnical report is unclear. Please arrange for a percolation test conducted by a licensed Geotechnical Engineer in the State of Colorado. Additionally, the plan view of the pond must clearly show and label the locations of infiltration test points. Further comments will be provided once these issues are addressed.

Supplemental geotechnical report has been prepared by Entech as requested (see Appendix E of revised FDR)

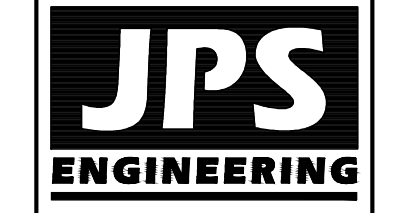
JPS responses to comments in red text
(County review comments in blue text)

Added RR callouts; RR calculations provided in Appendix D2

Added permanent Rock Check Dam and Riprap Apron call outs at each inflow point



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No.	REVISION	BY	DATE

MASTER DEVELOPMENT DRAINAGE PLAN

HORIZ. SCALE: 1"=200'	DRAWN: PV
VERT. SCALE: 1"=200'	DESIGNED: JPS
SURVEYED: N/A	CHECKED: LWA
CREATED: 8/28/06	LAST MODIFIED: 06/07/24
PROJECT NO: 080603	MODIFIED BY: PV
SHEET:	

D1

LEGEND

- PROPERTY LINES
- MAJOR DRAINAGE BASIN BOUNDARY
- MINOR DRAINAGE BASIN BOUNDARY
- 6520 --- EXISTING CONTOUR
- FLOW DIRECTION ARROW
- FLOWLINE
- 3 DESIGN POINT
- C14 DEVELOPED BASIN DESIGNATION
- 23.21 AC BASIN AREA (ACRES)

SUMMARY HYDROLOGY TABLE

DESIGN POINT	Q5 (CFS)	Q100 (CFS)
1	16.5	79.6
OA1	22.9	165.3
OA2	0.9	6.1
A1	25.1	171.2
OB1	15.9	113.7
OB2	2.5	16.6
B1.1	14.3	102.9
B3	17.5	84.1
B4.1	5.8	38.6
B6.1	67.2	305.2
B7	8.6	41.4
2	71.2	309.5
3	4.0	19.2
4	4.6	22.0

BASIN SUMMARY TABLE

BASIN	Q5 (CFS)	Q100 (CFS)
B3	17.5	84.1
B4	17.7	85.1
B6	21.5	103.6
B7	8.6	41.4
C	4.0	19.2
D	4.6	22.0

Proposed runoff at DP1 exceeds the existing runoff significantly. Please discuss on the safe management of this increased runoff.

Existing contours are shown extending over 200 feet beyond boundaries

Please display the off-site contour 50-100 feet beyond the boundary or drainage basin delineation line to illustrate how the runoff diverges from the site

Review C1: Turn off future improvements. If you want this information left in the report, refer to it as an "ultimate condition" map. Need to have proposed drainage map showing only existing and proposed conditions. Revise any drainage basins and routing as needed for this condition.

Review C2: Unresolved.

Sh. D1.2: Filing 2 Developed Drainage Plan was previously added in response to this comment: Title for this sheet has been updated to "Ultimate Conditions; For Reference Only"

Review C1: Include all basins and design points on the hydrology calculation spreadsheets which are shown on drainage maps
Review C2: Unresolved.

All basins and design points have been provided

OVERFLOW
Please show and label the emergency spillway of existing Pond A, ensuring it meets current criteria. Include calculations if proposing or upgrading.

Not a part of the Fig. 2 drainage analysis

Review C1: Silverado Hill Loop per F1 plat
Review C2: Unresolved.

"Silverado Hill View" is correct per the more recent "Filing 1A" Plat (VR237)

Review C1: Please show erosion protection and energy dissipaters between the channels and the existing ponds
Review C2: Unresolved. Please call out permanent check dam and erosion protection at each inflow point. Please see comment in the text.

Review C2: Unresolved. Please call out permanent check dam and erosion protection at each inflow point. Please see comment in the text.

Please upgrade the emergency spillway of the existing pond to meet the current criteria. Calculation is required.

Approx. 1,200 LF of existing grass buffer area to remain undisturbed with Filing No. 2

The flow from DP2 is concentrated and during minor storms, it exceeds existing conditions. Please provide erosion protection. Additionally, how can this concentrated flow downstream be mitigated?

Review C1: List all storm facilities/structures as public or private

Review C2: Unresolved.

Review C1: Easement lines missing. Please turn on
Review C2: Unresolved.

These comments will be addressed with the applicable future phase; this area will not be disturbed during Filing No. 2

This comment was addressed by adding a note at bottom of Sh. D1.2 stating "All Proposed Storm Facilities Are Private (HOA-Maintained)"

NOTE: SEE ADJOINING PARCEL OWNER INFO ON SH. EX2