

Project No.  
**3586.002.022**

November 10, 2022

Wiedemann Ranch GHAD Board of Directors  
Chair Diane Burgis  
Vice Chair Federal D. Glover  
Boardmember John M. Gioia  
Boardmember Candace Andersen  
Boardmember Karen Mitchoff

Wiedemann Ranch Geologic Hazard Abatement District  
651 Pine Street, Room 107  
Martinez, CA 94553-1229

Subject: Norris Canyon Estates  
Contra Costa County, California

**GEOLOGIC HAZARD ABATEMENT DISTRICT  
MONITORING – Fall 2022**

Dear Chair Burgis and Boardmembers:

ENGEO is pleased to submit this monitoring report for the Norris Canyon Estates development within the Wiedemann Ranch Geologic Hazard Abatement District (GHAD). This letter summarizes our observations made during our site visits in April and May 2022 within the Norris Canyon Estates (formerly known as Wiedemann Ranch) development in Contra Costa County, California. The previous spring 2022 monitoring event was completed in April and May 2022 (Reference 1), and a copy has been posted on the GHAD's website at [www.wiedemannranchghad.org](http://www.wiedemannranchghad.org). The Wiedemann Ranch GHAD has acquired Plan of Control monitoring and maintenance responsibilities for all residential and open-space parcels within the Norris Canyon Estates development (Reference 2).

**SCOPE**

The site visit included observation or monitoring of the following items.

- Slopes within the creek corridor, including drainage inlets, outlets, and other structures within the creek channel
- Common area and open-space slopes located adjacent to improvements
- Concrete-lined surface drainage ditches
- Storm drain inlets
- Debris benches
- Subdrain outlets and measurement of discharge volumes
- Settlement/slope monitoring instruments

## **CREEK CHANNELS**

In general, the creek channels within the GHAD-accepted portion of the Norris Canyon Estates development are deeply incised with oversteepened banks that are subject to slope failure. As stated in the Wiedemann Ranch Plan of Control, the creek channels will be allowed to mature naturally, which may include slope failures, unless there are substantial creek bank failures that threaten site improvements (Reference 3).

During the winter of 2016-2017, soil and debris blocked two culvert pipes and caused localized flooding of Ashbourne Drive and Ashbourne Circle. The creek channel repairs at 2310 Ashbourne Drive and adjacent to 3221 Ashbourne Circle (APN 211-410-001) involved removing soil, debris, and repairing riprap-lined basins. As part of the repair work, the Wiedemann Ranch GHAD prepared and submitted California Department of Fish and Wildlife Emergency Work Notification forms for both of these repair projects. The repairs were viewed during the most recent monitoring event and were performing well.

During our spring 2020 monitoring event, we observed a large piece of wood debris lodged against the flow reduction weir at the mouth of the culvert near Wall E and a wood pallet blocked the culvert outlet at Wall J. This debris prevented proper drainage and caused minor standing water within the culverts. The GHAD removed the debris and wood pallet to allow proper flow of the creek through the culverts. During the Fall 2020 monitoring event, we noted that tree branches had accumulated at the flow weir but did not appear to be obstructing channel flow. During this monitoring event, we observed dense accumulation of tree branches and debris at the flow weir (Site Condition A, Appendix A, Figure 1). The GHAD will remove the tree branches and debris during the GHAD's routine maintenance activities.

## **MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS**

In addition to the other structures within the creek channels, we observed the conditions of the mechanically stabilized earth (MSE) retaining walls above or adjacent to the culvert headwall structures. Many of the MSE walls within the development were observed to have some minor cracking. On Walls A, B, E, F, H, I, lower L1, and lower M, cracks ranging from hairline to ¼-inch wide were observed along or adjacent to planned expansion joints above culvert headwalls.

On Wall J, a 1-inch gap along an expansion joint was observed between the concrete headwall and the adjacent MSE retaining wall blocks during the 2002 monitoring event. During the 2007 site visit, it appeared that the gap had widened to approximately 2 inches. During the 2011 site visit, the gap had widened to approximately 2¼ inches. As observed during the most recent monitoring event, the gap has remained at approximately 2¼-inches wide (Site Condition B, Appendix A).

On the southern side of the upper portion of Wall M, cracks up to ¼-inch wide were observed in the wall, which is located at the base of the southern 1:1 (horizontal:vertical) creek bank slope. The cracks are not associated with an expansion joint. The cracks were first observed during the 2002 monitoring and do not appear to have significantly changed since the first observation.

Since the spring 2018 monitoring event, a few of the wall blocks were observed to be knocked off at the top of the MSE retaining walls. These missing wall blocks do not appear to be affecting the performance of the walls.



Observation of the above-listed retaining wall conditions should be included in future monitoring events.

### **COMMON AREA AND OPEN-SPACE SLOPES**

Since 2018, several minor landslides were observed along the 1:1 (horizontal:vertical) engineered fill slope, north of Lyndhurst Place, downhill from the nearby residences (Site Condition D, Appendix A, Figure 1). These shallow landslides were not of immediate concern but have been monitored during subsequent scheduled monitoring events. During this monitoring event, these landslides did not show any significant movement and the landslide areas were revegetated with wild grasses. The GHAD will continue monitoring these areas for slope stability.

During the spring 2018 monitoring event, we observed minor erosion that extended east of 2263 Ashbourne Drive (Lot 47). The erosion gully was located below a riprap dissipater located on the property. During our Fall 2021 monitoring visit, we observed the area was vegetated and the erosion had not significantly increased. Conditions were observed to be unchanged during this monitoring event (Site Condition E.1, Appendix A, Figure 1). This area will be monitored in future monitoring events and the erosion gully will be repaired as necessary. We also observed a minor erosion rill extending southwest of 539 Wycombe Court (Lot 106). The erosion rill begins at the property fence line and appeared to be caused by an open or damaged irrigation drip line (Site Condition E.2, Appendix A, Figure 1). The development Homeowner's Association (HOA) and property owner will be notified of the need for irrigation repairs, and the area will be monitored in future events.

During the winter of 2017/2018, a landslide occurred south of Ardleigh Court measuring approximately 35 feet in length, 35 feet in width, and up to 5 feet in depth. In October 2018, the GHAD repaired the landslide and restored the slope to the original graded condition. The repaired slope was observed during this monitoring event and appeared to be performing well (Site Condition F, Appendix A, Figure 2). This area will be monitored in future events to ensure the effectiveness of the repair.

We noted during our fall 2020 monitoring event that linear cracking parallel to the adjacent MSE Retaining Wall L2 and top of slope had occurred in the asphaltic concrete (AC) pavement along Ashbourne Drive. The cracks in the street ranged in width from hairline to 1 inch. We did not see evidence of any instability failure of the MSE retaining wall or downhill slope adjacent to the road at the time of our visit. During this monitoring event, the cracking within the street was visible due to recent wear and degradation of previously crack sealing of the asphalt paving on the roadways. The GHAD has an ongoing investigation to determine if the cracks in the AC are related to movement of the slope or MSE retaining wall.

During our spring 2021 monitoring event, we observed that the eastern slope of 3327 Ashbourne Circle (Lot 38) was saturated, as well as the access road downslope from the residence. This saturation caused the eastern slope of the access road to begin eroding. During this monitoring event, we did not observe overly saturated conditions along the eastern slopes of Lot 38 or the access road, and slope erosion appeared to be unchanged (Site Condition L, Appendix A, Figure 2). The GHAD will continue monitoring these areas for slope stability.

### **CONCRETE-LINED SURFACE DRAINAGE DITCHES**

The concrete drainage ditches were checked for accumulation of debris/sediment and for obvious distress, such as cracking or shifting of the concrete. Some minor cracking was observed in the concrete drainage ditches, but the cracks do not appear to be related to significant slope movement nor do they substantially impact the integrity of the ditches. As part of annual maintenance, the GHAD removes debris from the concrete-lined drainage ditches.

Retaining Wall L-5 subdrain outlet discharges directly over a separated drainage ditch expansion joint, and potential subdrain and/or surface water can seep through the separation and potentially saturate the soil of the slope (Site Condition H, Appendix A, Figure 2). During this monitoring event, the surrounding slope did not show significant saturation or movement. The expansion joint between segments of the concrete-lined drainage ditch should be sealed/patched, and the GHAD will continue monitoring the area for slope stability concerns.

During the spring 2021 monitoring event, we observed that Subdrain KL-18A outlet pipe was damaged. As a result, the subdrain pipe was shortened and unable to adequately discharge to the concrete-lined drainage ditch, and the discharge water caused minor erosion beneath the drainage ditch. During this monitoring event, we observed that the subdrain pipe had been repaired to provide proper discharge and prevent further erosion.

### **STORM DRAIN IMPROVEMENTS**

Storm drain improvements within the open space area of the GHAD appeared to be relatively clear of debris with the exception of some materials accumulating in drainage ditches and within drain inlet boxes where concrete-lined drainage ditches discharge into the inlets. Any accumulated material will be removed as part of the GHAD's ditch maintenance work.

During the Spring 2020 monitoring event, the top of the storm drain inlet box at the concrete-lined drainage ditch, located southwest of 3057 Ashbourne Circle (Lot 85), showed cracking and significant separation from the inlet box structure. At the time of this monitoring event, the cracking had not progressed (Site Condition I, Appendix A, Figure 2). The inlet box and cracks should continue to be monitored and, if needed, sealed or replaced to maintain the integrity and longevity of the drain inlet.

### **DEBRIS BENCHES**

The debris benches within the development were relatively free of debris and do not appear to require cleaning at this time.

## SUBDRAIN OUTLET MONITORING AND LOCATION

Subdrain outlet locations were observed and/or monitored during the site visit. Discharge levels flowing from the subdrain outlets are shown in Tables A and B (attached). We noted during our Spring 2022 monitoring event that many of the subdrain outlets were completely or partially blocked or not able to be located, and we were unable to measure flow volumes from these subdrains. Prior to this monitoring event, the GHAD had located, exposed and/or cleaned the subdrain outlets to provide proper drainage and monitoring of the subdrain discharges.

As shown in Tables A and B, we were unable to locate some of the subdrain outlets. The GHAD will continue to search for the surveyed locations of these outlets during future site monitoring, and, if possible, will locate, expose, and mark the outlets in the field for future monitoring.

## INCLINOMETER AND SONDEX SETTLEMENT MONITORING

In order to monitor engineered fill and graded slope performance, two monitoring devices were installed at 149 Lyndhurst Place (Lot 8) in December 1998. The monitoring devices, a slope inclinometer and a Sondex settlement monument, are located at the northwestern corner of the rear yard of the lot near the top of slope. A slope inclinometer is used to measure the lateral movement, if any, within the slope. The Sondex monitoring instrument is used to measure vertical movement within the engineered fill.

We attempted to contact the homeowner of Lot 8 during this monitoring event, but they were not available at this time to allow access to their rear yard. As access is provided to the GHAD, we will report monitoring results for the Sondex and inclinometer instruments in future monitoring letters.

As previously mentioned in this report, The GHAD has an ongoing investigation in regard to AC cracking along Ashbourne Drive, which includes monitoring of two slope inclinometers installed between Ashbourne Drive and MSE Retaining Wall L2 (Figure 1). Test results of the inclinometer readings performed during this monitoring event are presented in Appendix B.

If you have any questions regarding the contents of this letter, please contact us.


Sincerely,

ENGEO Incorporated



Greg Hudson

gh/eh/ca



Jeffrey A. Adams, PhD, PE



Attachments: Selected References  
Tables A and B  
Appendix A – Site Condition Summary with Photographs  
Appendix B – Inclinometer Test Results  
Figures 1 and 2 – Site Plan

## SELECTED REFERENCES

1. ENGEO. 2022. Geologic Hazard Abatement District Monitoring – Spring 2022, Norris Canyon Estates, Contra Costa County, California. June 30, 2022. Project No. 3586.002.021.
2. ENGEO. 2020. Wiedemann Ranch Geologic Hazard Abatement District Plan of Control Transfer Acceptance of Selected Parcels, Norris Canyon Estates, Contra Costa County, California. July 27, 2020. Project No. 3586.002.020.
3. ENGEO. 1998. Plan of Control for Wiedemann Ranch Geologic Hazard Abatement District (GHAD), Contra Costa County, California. May 1, 1998, Revised August 17, 1998. Project No. 3586-W4.

## **TABLES**

**Table A – Keyway Subdrains**

**Table B – MSE Retaining Wall Subdrains**

**TABLE A: Keyway Subdrains**

LABEL/LOCATION	FLOW (GALLONS/DAY)	COMMENTS
K-1	2; EST	Low flow
K-1A	-	UTM/UTL (beneath riprap embankment)
K-2 (west)	2282	
K-2 (east)	23; EST	Pipe invert at ground surface
K-3	46	
K-5	0	Dry
K-5A	274	
K-6	-	UTM/UTL (beneath riprap apron)
K-7	0	Dry
K-8 (north)	-	UTM (pipe outlet not visible/obstructed by riprap and soil)
K-8 (south)	1712	
K-9 (west)	23	
K-9 (east)	-	UTM/UTL (beneath riprap apron)
K-11	2; EST	Low flow
K-14	342	
K-16	0	Dry
K-17 (northwest)	0	Dry
K-17 (southeast)	913	
K-17 (east)	228	
K-21 (west)	23	
K-21 (east)	0	
K-22 (west)	23	
K-22 (east)	91	
K-24	456; EST	Pipe outlet visible but not accessible
K-26	23	
K-32	228	
K-33	0	Dry
K-39	0	Dry
K-39A	0	Dry
K-41	0	Dry
K-41A	0	Dry
K-42	342	
K-43	1369	
K-43A	1141	
K-43B	0	Wet
K-43C	-	UTM/UTL
K-45 (west)	1141	
K-45A	0	Dry



**TABLE A: Keyway Subdrains (Continued)**

LABEL/LOCATION	FLOW (GALLONS/DAY)	COMMENTS
K-45N	0	Dry
K-45 (east)	1141; EST	Pipe outlet visible but not accessible
K-46	-	UTL
K-47	114	
K-47A	0	Dry
K-58	23	
K-66	-	UTM/UTL (silted over by SD outfall wash)
K-70	0	Dry
K-D	-	UTM/UTA (within SD structure)
K-B	0	Dry
K-T	0	Dry
K-0S	0	Dry
S-3	685	
Lot 1	0	Dry
Lot 50, 7578	-	UTM/UTL (within homeowner property)
EVA Roadway	0	Dry
Bishop Tank Site	0	Dry
Ashbourne Drive Landslide	0	Dry
Ashbourne Drive	0	Dry
SAR-1	0	Dry
KL-1	0	Dry
KL-18A	0	Dry
KL-22	0	Wet
KL-22A	0	Dry
KL-22B	0	Dry
KL-22C	0	Dry
KL-28	0	Dry
KL-38	0	Dry
KL-48	0	Wet
KL-58	0	Dry
KL-60	23	
KL-92	-	UTM/UTL (within homeowner property)
KL-99	0	Dry
KL-101	0	Dry
KL-103	23	
KL-118	0	Dry
KL-121	-	UTM/UTL (within homeowner property)

**TABLE A: Keyway Subdrains (Continued)**

LABEL/LOCATION	FLOW (GALLONS/DAY)	COMMENTS
KL-122	0	Dry
KL-123	0	Dry
KL-124	0	Wet
KL-125	0	Dry
Ardleigh Drive Landslide	0	Dry
S-100	0	Dry
S-101	0	Dry
S-102	0	Dry
S-103	228	

**LEGEND**

- EST - Estimate
- UTM – Unable to monitor
- UTL – Unable to locate
- UTA – Unable to access

**TABLE B: MSE Retaining Wall Subdrains**

LABEL/LOCATION	FLOW (GALLONS/DAY)	COMMENTS
B (south)	2; EST	Low flow
B (north)	0	Dry
E	23	
F (east)	-	UTM (pipe outlet not visible/obstructed by riprap and soil)
G	0	Dry
I	0	Dry
J (south)	0	Dry
J (north)	0	Dry
L-2	0	Dry
L-5	0	Dry
M (northwest)	0	Wet
M (southeast)	0	Dry
P	114	
Q	0	Dry
V	0	Dry
RW-26	0	Wet
RW-31	-	UTM (within homeowner property)
RW-33	0	Dry
RW-54	-	UTM/UTL (within homeowner property)
RW-57	0	Dry
RW-61	0	Dry
RW-62	0	Dry
RW-67	0	Dry
RW-69	-	UTL
RW-70	0	Dry
RW-70A	-	UTM/UTL (within homeowner property)
RW-71	0	Dry
RW-71A	0	Dry
RW-72	0	Dry
RW-72A	0	Dry
RW-77	0	Dry
RW-96	-	UTM/UTL (within homeowner property)
RW-104	0	Dry
RW-105	-	UTM/UTL (within homeowner property)

**LEGEND**

EST - Estimate  
 UTM – Unable to monitor  
 UTL – Unable to locate  
 UTA – Unable to access

**APPENDIX A**

**Norris Canyon Estates  
Site Condition Summary with Photographs**

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Site Condition: A  
Observation Date: 09/29/2022  
Description: Dense accumulation of tree branches and debris at culvert weir.  
Recommendation: Remove tree branches and debris to allow for proper drainage.  
Field Representative: GH



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Site Condition: B  
Observation Date: 09/29/2022  
Description: 2 1/4-inch gap along retaining wall expansion joint.  
Recommendation: Continue to monitor.  
Field Representative: GH



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Site Condition: D  
Observation Date: 09/29/2022  
Description: Shallow landslides along 1:1 slope.  
Recommendation: Continue to monitor.  
Field Representative: GH



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Site Condition: E.1  
Observation Date: 09/29/2022  
Description: Minor erosion gully below riprap dissipator.  
Recommendation: Continue to monitor.  
Field Representative: GH



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Site Condition: E.2  
Observation Date: 10/03/2022  
Description: Minor erosion rill in slope caused by homeowner irrigation (Lot 106).  
Recommendation: Request HOA and homeowner to cap open drip line.  
Field Representative: None



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Site Condition: F  
Observation Date: 10/03/2022  
Description: Landslide repair.  
Recommendation: Continue to monitor.  
Field Representative: GH



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Site Condition: H  
Observation Date: 10/03/2022  
Description: Concrete-lined drainage ditch separated at expansion joint. Approximate 1-inch separation.  
Recommendation: Seal expansion joint separation.  
Field Representative: GH



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Site Condition: I  
Observation Date: 10/03/2022  
Description: Crack along top portion of DI box.  
Recommendation: Continue to monitor and replace if cracking affects DI function.  
Field Representative: None





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Site Condition: L  
Observation Date: 10/04/2022  
Description: Minor surface erosion along eastern side of rear yard slopes and access road slope.  
Recommendation: Continue to monitor.  
Field Representative: None

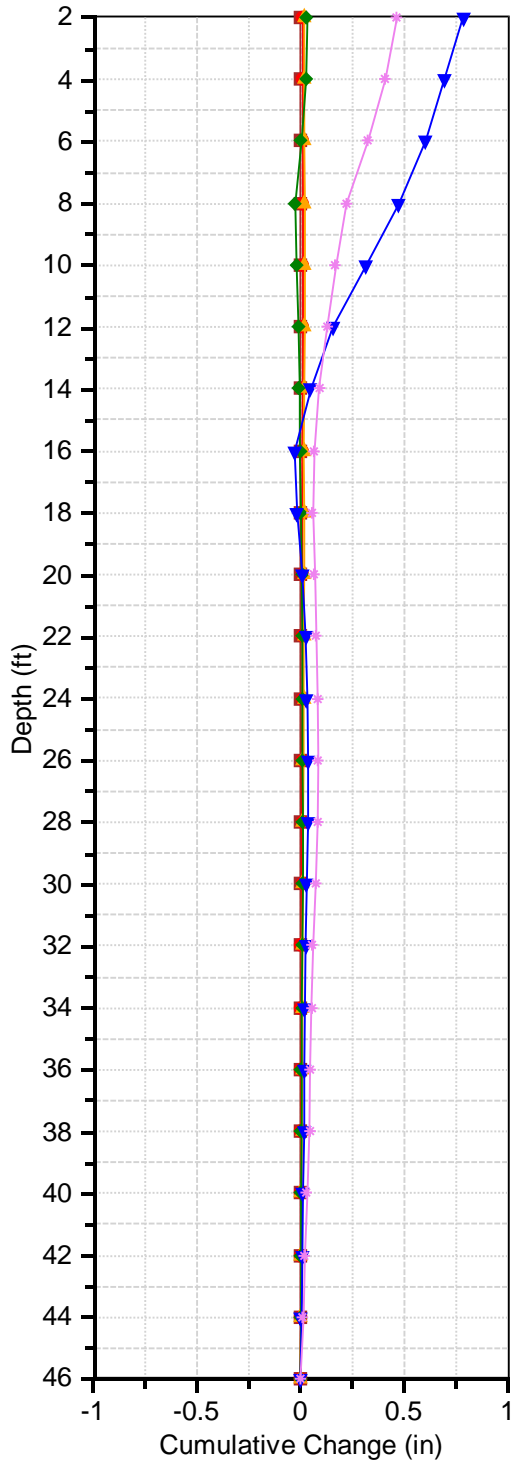


## **APPENDIX B**

### **Inclinometer Test Results**

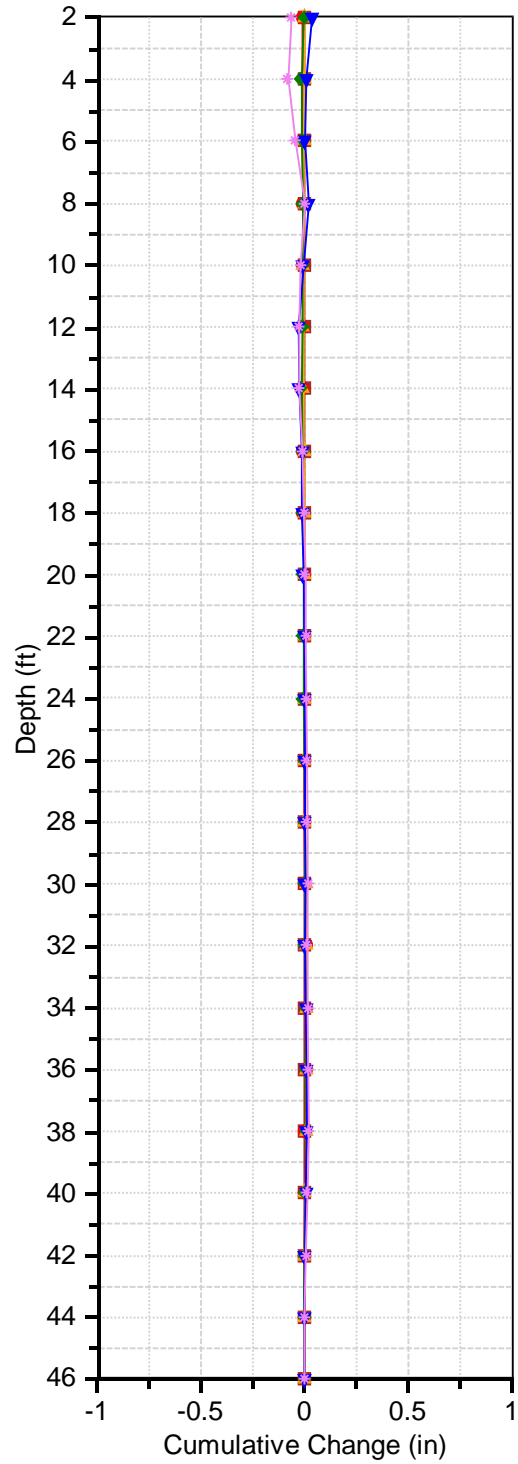
Norris SI-1 A

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12/2/2021 5/13/2022 10/4/2022



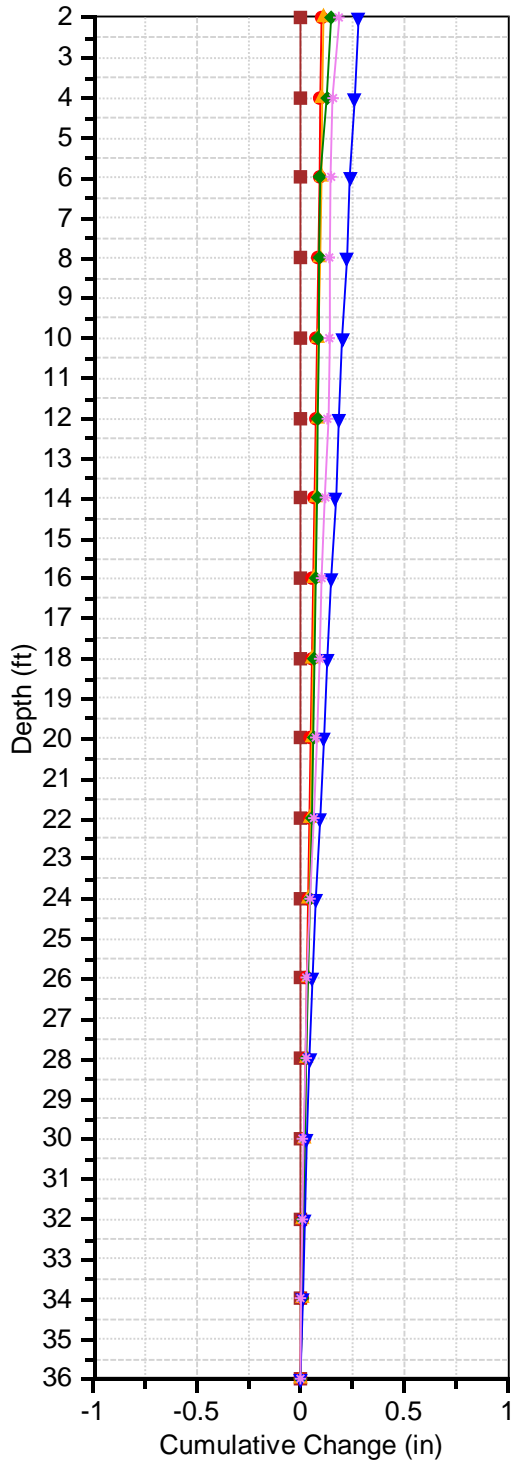
Norris SI-1 B

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12/2/2021 5/13/2022 10/4/2022



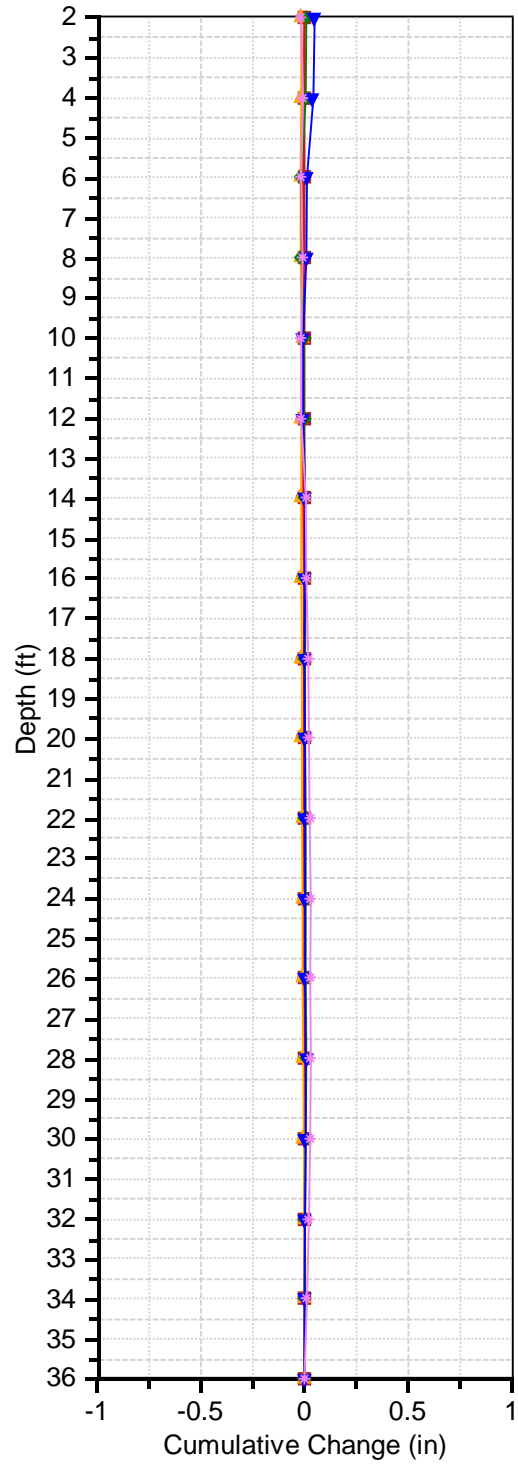
Norris SI-2 A

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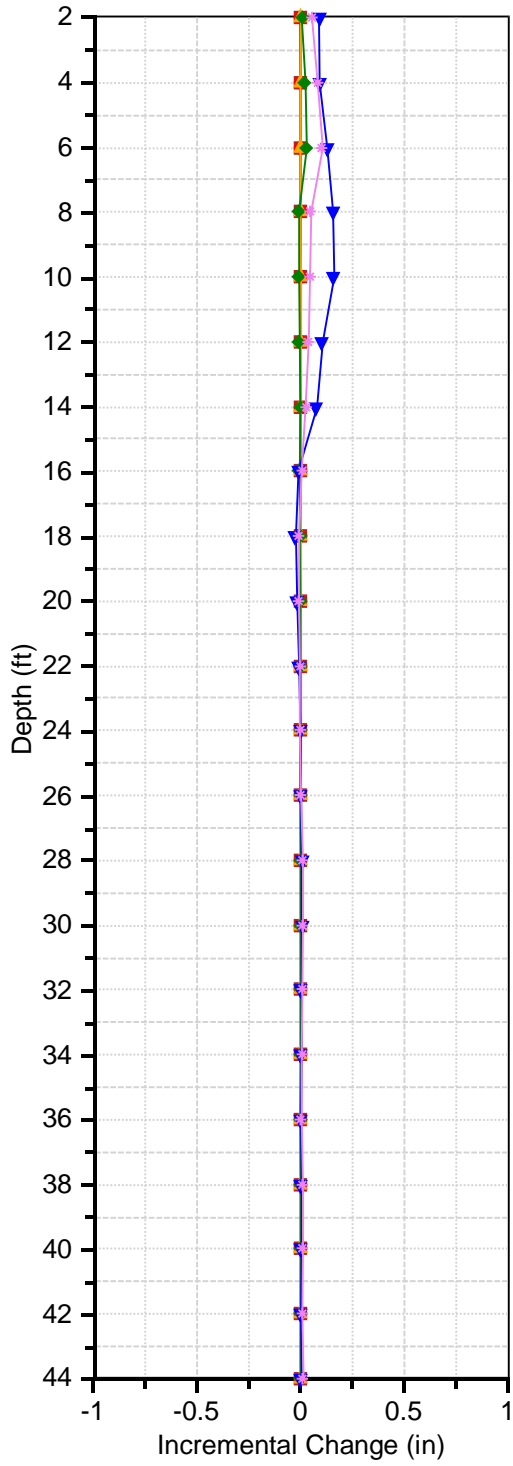
Norris SI-2 B

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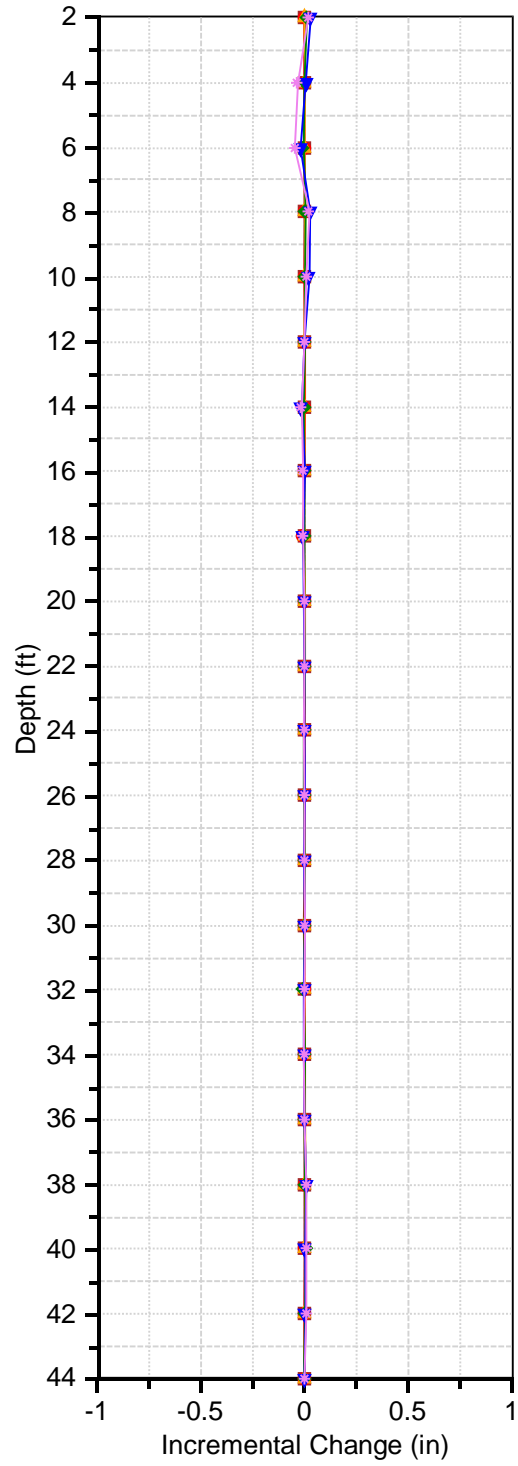
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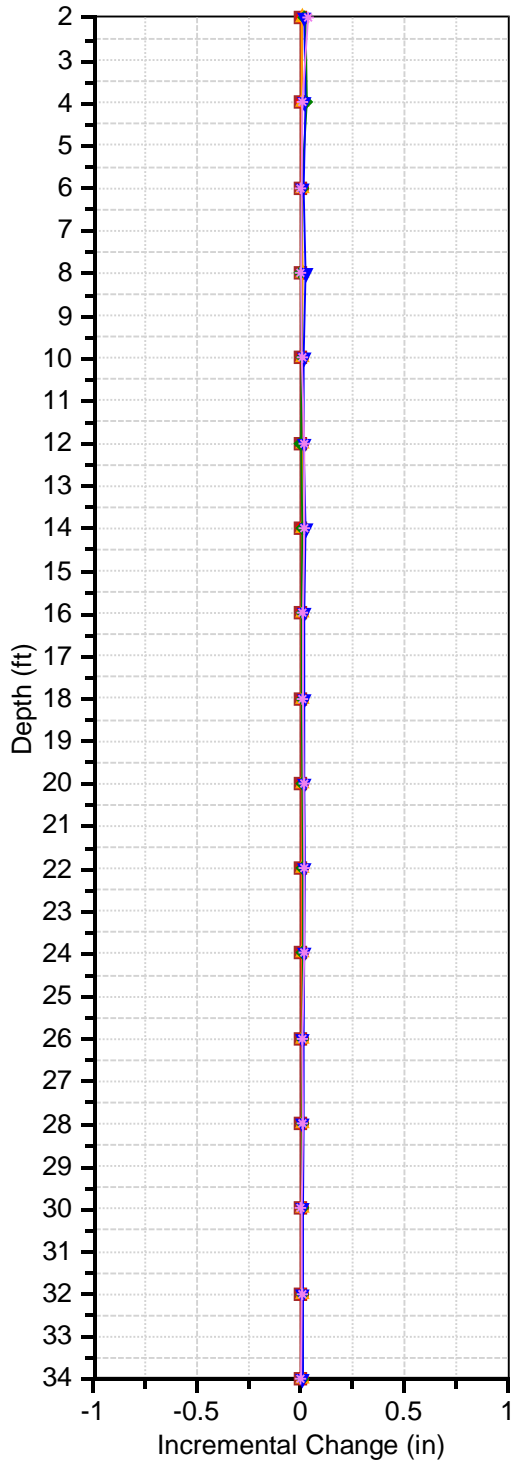
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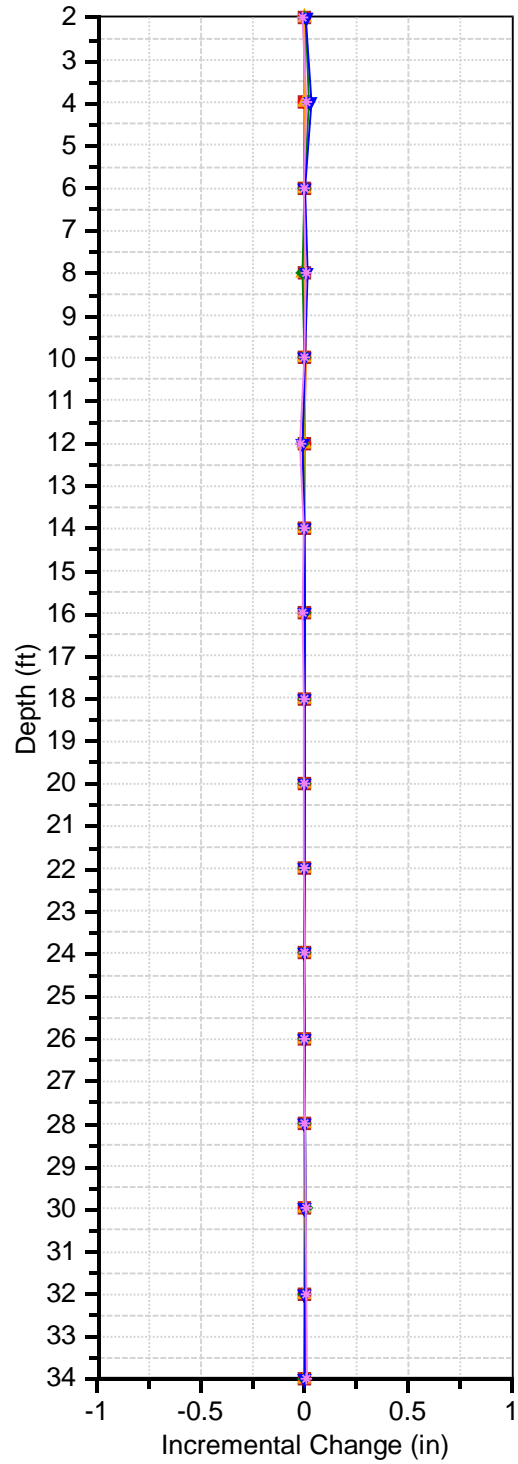
Norris SI-2 A

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Norris SI-2 B

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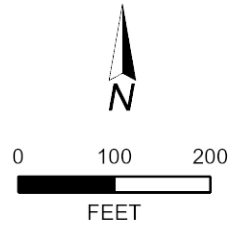




**FIGURES**

**Figures 1 and 2 – Site Plan**





**EXPLANATION**

ALL LOCATIONS ARE APPROXIMATE

- |     |                                |          |   |
|-----|--------------------------------|----------|---|
| ○   | SITE CONDITION (FALL 2022)     | 21121005 | ASSESSOR'S PARCEL NUMBER                        |
| +   | MONITORING INSTRUMENT          | —        | LANDSLIDE                                       |
| ●   | SUBDRAIN OUTLET                | —        | CONCRETE-LINED DRAINAGE DITCH                   |
| ■   | RETAINING WALL SUBDRAIN OUTLET | —        | RETAINING WALLS WITH WALL IDENTIFICATION LETTER |
| ●   | STORM DRAIN INLET              | ---      | GHAD BOUNDARY                                   |
| 727 | ADDRESS                        | □        | GHAD PARCEL                                     |
| 85  | LOT NUMBER                     |          |   |

BASEMAP SOURCE: NEARMAP MAPPING SERVICE 2022



**SITE PLAN**  
 NORRIS CANYON ESTATES  
 CONTRA COSTA COUNTY, CALIFORNIA

PROJECT NO. : 3586.002.022

SCALE: AS SHOWN

DRAWN BY: MAT CHECKED BY: HR

FIGURE NO.

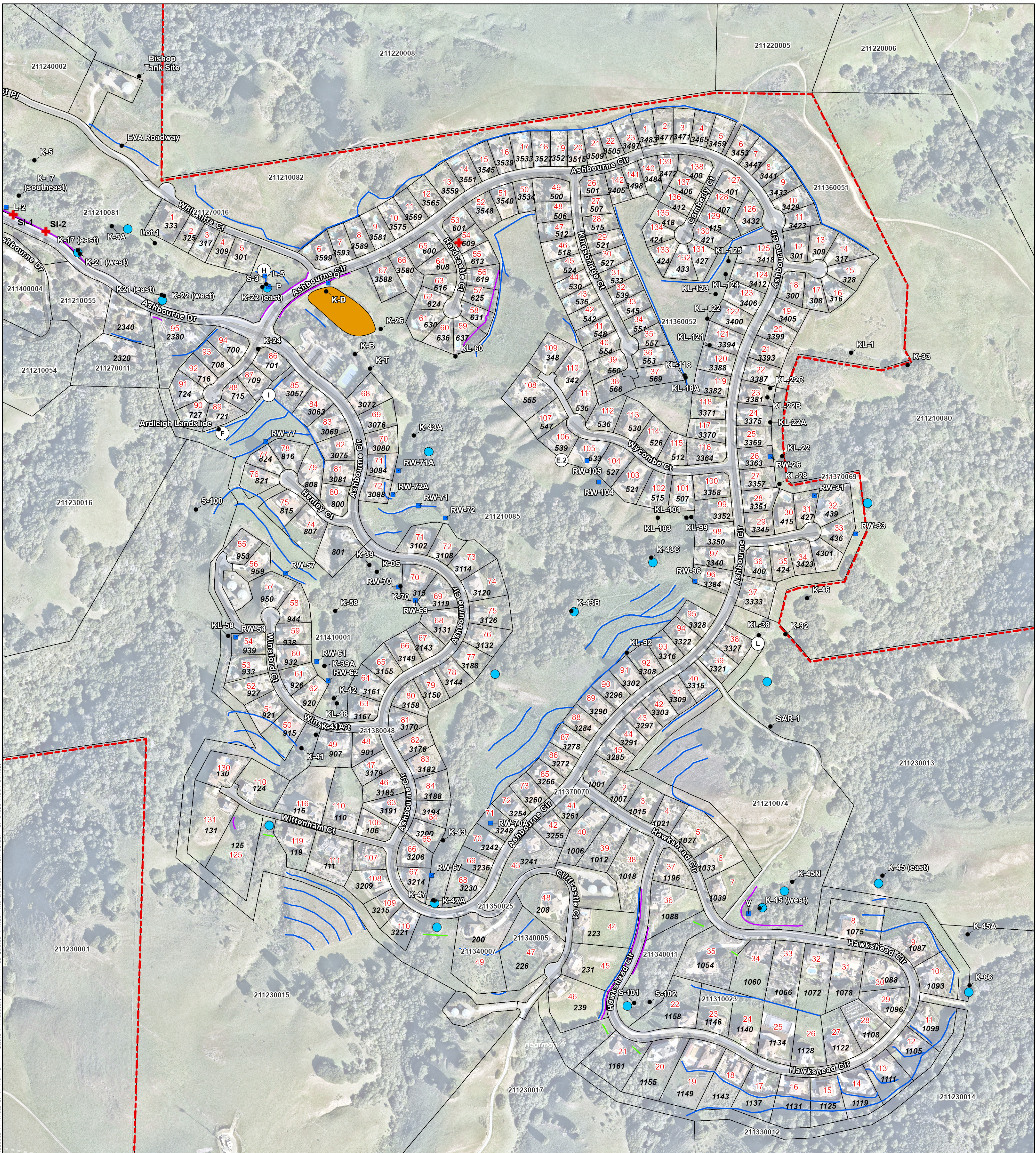
**1**

ORIGINAL FIGURE PRINTED IN COLOR

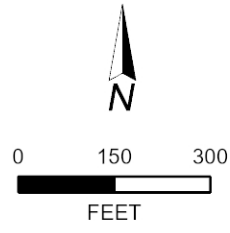
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 LAYOUT: SITE PLAN USER: MTORES





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**EXPLANATION**

- ALL LOCATIONS ARE APPROXIMATE
- |                                  |   |
|----------------------------------|---|
| ○ SITE CONDITION (FALL 2022)     | 21121005 ASSESSOR'S PARCEL NUMBER                 |
| ⊕ MONITORING INSTRUMENT          | — CONCRETE-LINED DRAINAGE DITCH                   |
| ● SUBDRAIN OUTLET                | — RETAINING WALLS WITH WALL IDENTIFICATION LETTER |
| ■ RETAINING WALL SUBDRAIN OUTLET | — CATCHMENT FENCE                                 |
| ● STORM DRAIN INLET              | ⋯ GHAD BOUNDARY                                   |
| 727 ADDRESS                      | ▭ GHAD PARCEL                                     |
| 85 LOT NUMBER                    | ■ BASIN   |

BASEMAP SOURCE: NEARMAP MAPPING SERVICE 2022



**SITE PLAN**  
 NORRIS CANYON ESTATES  
 CONTRA COSTA COUNTY, CALIFORNIA

PROJECT NO. : 3586.002.022	FIGURE NO.
SCALE: AS SHOWN	<b>2</b>
DRAWN BY: MAT	CHECKED BY: HR