OGDEN VALLEY PLANNING COMMISSION

MEETING AGENDA

May 24, 2022

Pre-Meeting 4:30/Regular Meeting 5:00

- ***Pledge of Allegiance***
- ***Roll Call:***

1. **Minutes: March 22, 2022**
2. **Training**

3. **Consent Items:**

3.1 CUP 2022-06: Request for approval of a conditional use permit for a water tank and well house located at approximately 2051 N Highway 158, Eden. **Presenter Tammy Aydelotte**

3.2 CUP 2022-07: Request for approval of a conditional use permit for a new water tank and pump house, attached to an existing pump house, located at approximately 7780 E Summit Pass Rd, Eden. **Presenter Tammy Aydelotte**

Petitions, Applications, and Public Hearings:

4. **Administrative Items:**

4.1 CUP 2022-03: Request for a conditional use permit for a conference center located in the Evergreen Subdivision at approximately 2257 N River View Road, Huntsville, UT, 84317. **Presenter Tammy Aydelotte**

4.2 UVB04042022: Request for preliminary approval of Bright Acres Subdivision, a four-lot subdivision located in the AV-3 zone, at approximately 5638 N 3100 E, Liberty, UT. **Presenter Tammy Aydelotte**

4.3 UVH – 042622 Consideration and action on a request for preliminary approval of Hidden Brook Estates Subdivision, consisting of 9 lots. **Presenter Felix Lleverino**

4.4 CUP 2022-05 Consideration and/or action on a conditional use permit for short term rental use at 4945 E. Wolf Lodge Dr., UT, 84310. **Presenter Marta Borchert**

5. Public Comment for Items not on the Agenda:

6. Remarks from Planning Commissioners:

7. Planning Director Report:.

8. Remarks from Legal Counsel:

Adjourn to Work Session

WORK SESSION

Work Session: A presentation and discussion by a member of the public discussing commercial zoning surrounded by residential zoning. **Presenter: Rick Walton**

The regular meeting will be held in person at the Weber County Commission Chambers, in the Weber Center, 1st Floor, 2380 Washington Blvd., Ogden, Utah.

& Via Zoom Video Conferencing at https://us02web.zoom.us/j/82173922403 Meeting ID: 821 7392 2403

A Pre-Meeting will be held at 4:30 p.m. The agenda for the pre-meeting consists of discussion of the same items listed above, on the agenda for the meeting.

In compliance with the Americans with Disabilities Act, persons needing auxiliary services for these meetings should call the Weber County Planning Commission at 801-399-8761

Meeting Procedures

Outline of Meeting Procedures:

- The Chair will call the meeting to order, read the opening meeting statement, and then introduce the item.
- The typical order is for consent items, old business, and then any new business.
- Please respect the right of other participants to see, hear, and fully participate in the proceedings. In this regard, anyone who becomes disruptive, or refuses to follow the outlined procedures, is subject to removal from the meeting.

Role of Staff:

- Staff will review the staff report, address the approval criteria, and give a recommendation on the application.
- The Staff recommendation is based on conformance to the general plan and meeting the ordinance approval criteria.

Role of the Applicant:

- The applicant will outline the nature of the request and present supporting evidence.
- The applicant will address any questions the Planning Commission may have.

Role of the Planning Commission:

- To judge applications based upon the ordinance criteria, not emotions.
- The Planning Commission's decision is based upon making findings consistent with the ordinance criteria.

Public Comment:

- The meeting will then be open for either public hearing or comment. Persons in support of and in opposition to the application or item for discussion will provide input and comments.
- The commission may impose time limits for comment to facilitate the business of the Planning Commission.

Planning Commission Action:

- The Chair will then close the agenda item from any further public comments. Staff is asked if they have further comments or recommendations.
- A Planning Commissioner makes a motion and second, then the Planning Commission deliberates the issue. The Planning Commission may ask questions for further clarification.
- The Chair then calls for a vote and announces the decision.

Commenting at Public Meetings and Public Hearings

Address the Decision Makers:

- When commenting please step to the podium and state your name and address.
- Please speak into the microphone as the proceedings are being recorded and will be transcribed to written minutes.
- All comments must be directed toward the matter at hand.
- All questions must be directed to the Planning Commission.
- The Planning Commission is grateful and appreciative when comments are pertinent, well organized, and directed specifically to the matter at hand.

Speak to the Point:

- Do your homework. Obtain the criteria upon which the Planning Commission will base their decision. Know the facts. Don't rely on hearsay and rumor.
- The application is available for review in the Planning Division office.
- Speak to the criteria outlined in the ordinances.
- Don't repeat information that has already been given. If you agree with previous comments, then state that you agree with that comment.
- Support your arguments with relevant facts and figures.
- Data should never be distorted to suit your argument; credibility and accuracy are important assets.
- State your position and your recommendations.

Handouts:

- Written statements should be accurate and either typed or neatly handwritten with enough copies (10) for the Planning Commission, Staff, and the recorder of the minutes.
- Handouts and pictures presented as part of the record will be left with the Planning Commission.

Remember Your Objective:

- Keep your emotions under control, be polite, and be respectful.
- It does not do your cause any good to anger, alienate, or antagonize the group you are standing in front of.

Minutes of the Business Meeting of the Ogden Valley Planning Commission for March 22, 2022. To join the meeting, please navigate to the following weblink at, https://us02web.zoom.us/j/88363450613, the time of the meeting, commencing at 4:30 p.m.

Ogden Valley Planning Commissioners Present: Trevor Shuman, Chair; Shanna Francis, Vice Chair, Jeff Burton, John (Jack) Howell, John Lewis, Jared Montgomery, and Justin Torman.
Absent/Excused: None
Staff Present: Charlie Ewert, Principal Planner; Scott Perkes, Planner; Courtlan Erickson, Legal Counsel; Marta Borchert, Office Specialist.

- **Pledge of Allegiance**
- **Roll Call:**
  Chair Shuman asked if anyone had any ex parte communication or conflict of interest to declare. No disclosures were made.

1. Approval of Minutes for January 25 and February 1, 2022.

Chair Shuman indicated Commissioner Burton has requested corrections requested by Commissioner Burton; he invited Commissioner Burton to summarize the corrections, which he did. He suggested that his communication of the requested corrections be attached to the minutes once they are published.

Commissioner moved to approve the minutes of the January 25 and February 1, 2022 meetings as amended. Commissioner seconded the motion. Commissioners Francis, Burton, Howell, Lewis, Montgomery, Shuman, and Torman all voted aye. (Motion carried 7-0). ***I DIDN'T CATCH AN ACTUAL MOTION ON THE MINUTES AFTER COMMISSIONER BURTON EXPLAINED THE CORRECTIONS HE WAS REQUESTING.***

2. Petitions, Applications, and Public Hearings:
Administrative Items.

2.1 DR 2022-01 – Request for approval of a design review application for storage units located at approximately 4708 E 2650 N, Eden, UT, 84310. **Presenter Tammy Aydelotte**

A staff memo from Planner Aydelotte explained the applicant is requesting an administrative design review approval of storage units. The proposal consists of seven buildings with 194 total storage units. Applicant will be installing some signage, and installing exterior lighting that will be compliant with the Outdoor Lighting ordinance

Ms. Aydelotte summarized staff's analysis of compliance with applicable codes relating to traffic safety and congestion; outdoor advertising; outdoor lighting; landscaping; building and site layout; and development standards. She noted that all construction and development of the site must adhere to the recorded development agreement. She added that the proposal conforms with the Ogden Valley General Plan by continuing commercial development within existing commercial and village areas. She concluded the Planning Division recommends approval of file# DR 2022-01, subject to all review agency requirements and the following conditions:

1. All exterior lighting, must comply, with the Outdoor Lighting requirements, as outlined in LUC§ 108-16, and will be verified at occupancy.
2. All proposed signage will be reviewed when a detailed signage plan is submitted for request of a land use permit. If no signage is proposed, then the developer need to indicate on the building permit application.
3. Development of this site shall conform with the recorded development agreement.
4. The developer will provide a financial guarantee for all improvements including site and trail paving, landscaping, and fencing.

The recommendation for approval is based on the following findings:

1. The proposal complies with applicable County codes.
2. The proposed project conforms to the Ogden Valley General Plan.

Discussion among the Commission centered on requested building heights and the elevation of the property; Commissioner Burton identified a nearby home and asked if the fencing and landscape intended to screen the project from the nearby home

will be adequate. Ms. Aydelotte stated that it will likely not shield the view of the entire building; rather, the intent of the berm and landscape is to mitigate the noise and view of increased traffic.

Chair Shuman invited input from the applicant. He asked if fencing will be installed on the east side of the subject property. The applicant, Jeff Allan, stated that it will not be installed on the east side. Ms. Aydelotte stated the intent of the fencing plan is to separate uses from one another, but not necessarily separating differing zones. The existing home is located in a commercial zone, but it is a residential use, and the County will require a wall or berm all along the eastern boundary of the proposed development. Internally, Mr. Allan is proposed fencing that will provide security for the storage units, but this is different than the wall or berm that is required along the eastern boundary of the subject property. This is required by the development agreement.

Chair Shuman invited public input.

Frank Noll stated he lives in Ogden, but his son lives near the subject property, and he sent a text regarding his concerns about the project. He asked if the property is near the residential area that is served by Staples Drive. He asked if the storage units will be constructed east of the existing LDS meeting house in that area; he is concerned about whether there will be a fence or barrier of some kind to the west of the subject property. Chair Shuman indicated that the subject property is directly west of Snowcrest Junior High.

There were no additional persons appearing to be heard.

Commissioner Howell moved to approve application DR 2022-01, request for approval of a design review application for storage units located at approximately 4708 E. 2650 N., Eden, UT 84310, based on the findings and subject to the conditions listed in the staff report. Commissioner Torman seconded the motion. Commissioners Francis, Burton, Howell, Lewis, Montgomery, Shuman, and Torman all voted aye. (Motion carried 7-0).

3. Petitions, Applications, and Public Hearings:
Legislative Items.

3.1 ZTA 2021-07 - Public hearing to discuss and/or take action on an application to amend the Form-Based Village zoning ordinance along with other sections of the Weber County Land Use Code to add provisions and exhibits intended to create a Nordic Valley Village Area. **Staff Presenters: Scott Perkes & Charlie Ewert**

A staff memo from Planner Perkes explained the County recently received an application by Skyline Mountain Base to create a smaller Destination And Recreation Resort Zone (DRR-2), as opposed to the existing DRR-1 zone, in order to create the regulatory framework to which their property could be rezoned. In reviewing this request, County staff ultimately recommended that the applicant pursue an amendment to the recently adopted Form-Based Village (FBV) zoning classification as a means to achieve the desired outcome for their property. Following this recommendation, the applicant has spent the past several months working and negotiating with staff to identify adjustments and additions needed to the FBV ordinance to accommodate their vision. The attached Exhibit A contains the revised draft of the FBV zoning ordinance created through this effort.

Mr. Perkes and Principal Planner Ewert summarized staff's analysis of policy considerations relating to text amendments; street types and lot area comparison; adjustments to development standards and street cross sections; height allowances specific to the Nordic Village; adjustments to parking standards; addition of specific Nordic Village design standards; and addition of a specific Nordic Village street regulating plan. He noted that in general, land use code changes should be vetted through the filter of policy recommendations of the applicable general plan. In 2016, the Ogden Valley General Plan was adopted after a significant public involvement process and received overwhelming support from Valley residents. He presented a map from the General Plan identifying commercial locations and village areas, noting the proposed adjustments to the Form-Based Village zoning ordinance helps to implement numerous goals and objectives of the Ogden Valley General Plan. He then noted no action has occurred on this item to-date. The Ogden Valley Planning Commission has viewed the proposal in a work session during their February 15, 2022 meeting. Additionally, during the December 28, 2021 meeting, the Planning Commission was introduced to a proposed village plan by Skyline Mountain Base to begin developing a village area for the Nordic Valley Ski resort. He concluded Staff recommends that the Planning Commission consider the text included as Exhibit A and offer staff feedback for additional consideration, if any. Alternatively, when/if the Planning Commission is comfortable with the proposal, a positive recommendation could be passed to the County Commission with the following findings:

1. The changes are supported by the 2016 Ogden Valley General Plan.
2. The proposal serves as an instrument to further implement the vision, goals, and principles of the 2016 Ogden Valley General Plan.
3. The changes will enhance the general health and welfare of County residents.

Mr. Perkes and Mr. Ewert engaged in high level discussion with the Commission regarding topics such as form-based zoning; transfer of development (TDR) rights from the valley floor to the project area; the highest and best use of properties within the rezone area; the potential for the zone change to impact property values; opportunities for regulating the Village Zoning regulations and the General Plan; the list of permitted and conditional uses included in the land use table for the zone;

Chair Shuman invited input from the applicant. He expressed appreciation to the applicant for hosting open house events to give residents the opportunity to learn more about the project.

Eric Langvardt, Langvardt Design Group, and applicant's representative, Laurent Jouffray, approached. Mr. Langvardt stated he is thankful for the time County staff has dedicated to this project; he has held five public meetings, including the work session with the Planning Commission, and he anticipates most of the comments tonight to be in regard to the plan rather than the rezone; however, he is not seeking approval of something that will increase density in the area. Instead, he is looking for guidance to form and shape the density that the current zoning already allows.

Chair Shuman then asked for a motion to open the public hearing; he summarized the rules for those wishing to address the Commission during the public hearing.

Commissioner Burton moved to open the public hearing. Vice Chair Francis seconded the motion; all voted aye.

Joanna Droubay stated she hopes that the Commission will delay taking action on this issue tonight given that the red-lined version of the proposed ordinance amendments were not included in the public packet. The Form Based Village zoning ordinance will be the rules that will govern this development, so it is very important that the public is aware of what those rules are. She has reviewed the staff report thoroughly but is unsure of the entirely of the proposed ordinance amendments. She addressed the request to increase the maximum building height restriction from 50 to 55 feet; she understands that this request is based upon a desire to pursue certain architectural elements, but she does not feel that the height increase is necessary. She asked for an animated 'fly-through' of the concept plan to illustrate the proposed building heights and setbacks. She feels that one of the biggest issues for the Commission to consider relates to TDR actions; she owns nine acres on a hillside and has three development rights, but road rights of way, steep slopes, and waterways should be deducted from total area for the purposes of determining an appropriate TDR action.

(name inaudible) stated he is a licensed engineer in the State of Utah; he addressed employee housing in the proposed project and stated that the way the language is written regarding this component of the project, it does not count towards the overall allowable density for the project. This creates an unnecessary loophole, in his opinion, where unlimited employee housing could be constructed. He could see a scenario where Powder Mountain may choose to locate their employee housing at Nordic Valley because of this. He also addressed the increase in the maximum building height; he is not totally opposed to the increase but noted there are no setbacks relating to the increase and depending on how the future road plan is developed, there could be very large buildings right next to residential lots. The increase in building heights should be rejected until setbacks can be established. He stated he used an engineering grade inclinometer and range finder to measure buildings around the Valley and he presented images of these efforts to illustrate the relationship between large buildings and existing development/infrastructure in the area. He then noted the staff report for this application discusses proportional decreases in density in other areas, but he sees three villages that are not condensed into one as called for in the General Plan; the area above Viking Drive is larger than the dense area at the 'bottom'. He stated that the village areas are disconnected and there should not be three separate FV-3 projects. There is also mention of the Village being a quarter mile in radius, but it is actually 1.2 miles from one end to the other and it does not meet the intent of the General Plan. He stated that the staff report also mentions that the proposal will enhance the general health and welfare of the County residents; however, if the project meets the General Plan, he wondered why it needs to be rezoned. The proposal will create sprawl rather than consolidating development at the base of the ski are per the General Plan. He concluded the proposed changes will be detrimental to the residents of the Nordic Valley neighborhood; 55-foot buildings without setbacks will destroy the character of the area and he feels the text amendment should be rejected or tabled and considered at a time in the future in conjunction with the rezone application. Further work is needed to provide protection for existing residents through an umbrella over any master development plans proposed by the current or

future developers. As written, the stroke of a pen could allow natural forest and open space at the heart of Nordic Valley to be replaced with large, incompatible 55-foot structures; it also allows uncontrolled construction of low-income housing. Form Based Village Zoning does not seem like the right fit for Nordic Valley. It is already zoned for a modest sized village at the base area, but if this land is rezoned to FBV, the value of the land will increase and owners will likely sell to another developer that will have different visions for the master plan. Without restrictions, this could destroy the character of this unique area. He stated that he presented to the Commission in 2006 regarding a rezone at that time; he provided a document illustrating density calculations provided by the owner of Wolf Creek at that time and noted that their density calculation is much different than what has been presented tonight. The 2006 density proposal was 441 units, including bonus densities, but the 2022 proposal is 763 units. The public needs to see how those calculations were performed. Without bonus densities, the unit total is 382, which is half of the 763 units. The applicant is also proposing to consider each hotel room to be equivalent to .33 units rather than a half of a unit; condominium units would be considered to be half of a unit so that they can get double the condominium units in the project. The commercial square footage and workforce housing is not being counted towards density of the project, these are major issues that must be addressed.

Jan Fulmer stated she was involved in the development of the Ogden Valley General Plan; it was a great experience, and she supports the village concept identified throughout the Plan. However, she feels bonus development units are inappropriate in the Form Based Village Zone as it will dramatically exceed the buildout of the entire Valley. The Valley needs sustainable development rather than uncontrolled increases in development. Also, if the units for workforce housing are going to be set aside and not considered in the TDR action, there will be no limit on the number of such units that can be built. She asked that the Commission reconsider these issues and ensure that the project complies with the Ogden Valley General Plan.

Robbie Kunz stated that he lives in the Nordic Valley area, and he wants to know why the County is considering a "Park City-sized" village at the smallest ski resort in Utah when both the Ogden Valley General Plan, and Mr. Jouffray himself, identify the appropriate development at the site as a 'small boutique village'. He stated he is wondering if this is more about need or greed when considering a project of this size. The Ogden Valley General Plan identifies goals and visions for the Valley and indicates land uses in the Valley should complement, not overwhelm or compete with, the rural character of the Valley. The vision statement indicates the rural character of the Valley is defined by its open fields, agricultural lands, stands of trees, peace and quiet, dark skies, clean air and water, abundant wildlife, and small villages. He stated that the project that has been proposed is not a small village; he has researched what a small village may look like and he has sent information to Mr. Perkes. He referenced Eagle Point, Solitude Ski Resort, Sundance Ski Resort, and Grant Targhee, which are all villages that have been developed at the base of ski resorts. The proposed project at the Nordic Valley ski resort is between four and ten-fold larger than those other four resorts. At Solitude, there are 219 residential units and 46 hotel rooms. The residential units per acreage at this propose project is even more dense than the other resorts. The bottom line is that the proposed village is not a boutique village and is far larger than any other village in Park City.

Kara Noelle stated that she has owned a cabin in the Ogden Valley for 35 years and she loves the area. She has not read through all the materials regarding this project, but she has not heard any mention of availability of water to serve this project. The drought conditions are persisting in Utah and secondary water may not be available until May. Residents have been advised to not plant new trees or gardens; there are farmers in the Valley that need water to continue farming and water for the proposed project must be addressed. She stated that there is talk about building a village, but no talk of the roads that will serve the village or the pollution that will be generated by traffic driving to and from the village.

Felice Quigley stated she lives at the base of Nordic Valley and she spoke to the similarities in the mixed-use commercial and multi-family residential zoning designations; for all intents and purposes, they are essentially the same in terms of use, setbacks, minimum lot size, and building heights. Tonight, those in attendance have heard from staff, developers, and residents and there are many concerns about TDR actions. In the current land use code, there is no definition of base density except for when density is going to be increased. Base density must be defined in order for everyone to understand how overall density will be calculated. One of the principles that is enumerated in the General Plan is to define buildable acreage as precluding anything that is over a 30 percent slope. She asked that the application not be approved until there is a specific definition for base density. She left a written document detailing her analysis of these issues with the Commission.

Dave Boll stated he lives on Viking Drive; he agrees with the concerns that have been expressed by other residents and added that one concern he has relates to small lot residential units in development area four in the project plan. This area is very close to his home and other single-family homes in the area; the density does not resemble existing development in the area, and he asked for a graduated increase in density rather than something that is so dramatic. He added that the application also proposes

that the wastewater treatment or disposal facilities be permitted under the open space zone, and he is not sure how that would work unless it is possible to ensure that the wastewater treatment will not be detrimental to the open space. Otherwise, that use should be removed from the open space zone. He is also concerned about parking and internal block access; the applicant has indicated that they do not want the asphalt surface to be available for seasonal day skiers, but something must be done to increase parking at Nordic Valley. The current parking area is a mud pit throughout times of the year.

Ron Gleason echoed the request that the Commission table action on this application to give the public more time to review the specifics of this request. It took three years to get Form Based Zoning codified and it is inappropriate to consider drastic changes to the Zone in just a few weeks' time. The staff, Planning Commission, and public need more time to review. He asked that the maximum building height not be increased; he also indicated that building standards should be reviewed to determine that the architecture will be harmonious with its surrounding. Large windows and excessive lighting will cause light pollution in the area. He addressed staff and asked them to identify the maximum number of units that will be allowed in the project if the requested zoning is approved. He agreed with the comments made about workforce housing but noted that employee housing was granted at Snow Basin that did not count towards the maximum number of units in that project. That approval created a precedent that other developers will also expect.

Fred (no last name given) stated he has one question about the project and that is in regard to water use and consumption associated with the project. It is his understanding the Weber Basing Water Conservancy will be issuing restrictions on irrigation water allowing just one day per week watering for existing residents in the Valley. Existing users in the system have made investments in their properties with the understating that they would have irrigation water for their property, and they will be severely restricted. One day per week watering will result in severe damage to landscaping and he asked how the County can be considering increased growth that will harm existing residents. This type of action is not responsible and is not fair to people who have already invested in their properties in the Valley.

Bruce Keswick stated he lives in Viking Drive, and he has met with the developer and other residents during the open house meetings. Residents have proposed to the developer that the south village development rights be allocated via a conservation easement to the Ogden Valley Land Trust; this would also include the open space west of the proposed south village development. Residents do not want to see the south village development occur as it would be very costly to install infrastructure in that area. The area is very steep and is right up against existing housing and residents would like for the development rights allowed to that area be shifted to another area, such as to the north side of the resort. He provided the Commission with a written document summarizing this request. He then stated that many of the residents on Viking Drive share the same concerns about the increased in short term rental (STR) units in the area; there will be approximately 763 new STRs in a neighborhood where there are presently 225 residents. This is excessive, especially considering that the Commission has not developed licensing guidelines for STRs.

Mandy McClean stated that she also lives in the Nordic Valley, and she was attracted to the area because of the rural nature and quaintness of the ski resort. She does not want to see this type of development that will impact the natural environment, climate, and water sources in the area. She stated that the project will change the entire area and eliminate the appeal that drew her to purchase a home there.

Mike Strosky stated that he lives in a home that abuts the parking lot of the Nordic Valley ski resort; he agrees with nearly everything that has been said tonight by other residents in the area but added that he is a Waste Engineer, and he deals with energy conservation and waste energy. He has spent a lot of time in wastewater treatment plants and one of the issues that has not been discussed tonight is PFOS, which is a pollutant in wastewater. This proposal to recycle water is very complex and will be very costly. The PFOS will be sprayed onto the land surrounding the treatment facility and it will drain back into secondary and drinking water sources. He will provide the findings of his research to the Commission and asked them to keep this issue in mind when acting on the proposal before them.

Darren Robosky stated he lives on Nordic Valley Drive, and he feels this area is different from the other parts of the Valley that have been identified as appropriate for Form Based Village Zoning; the Ogden Valley General Plan specifically states that urban sprawl is not desirable and that there should not be a 'sea of houses/rooftops on the Valley floor'. The current designation of the vast majority of the proposed units are contained within the FSV-1 zone designation. This zone is intended for low density residential development to minimize the impact to surrounding environment and visual appeal of the area. He cannot envision how the development can occur in a way that complies with that directive. The area is beautiful and very appealing, and he does not feel that the project meets the intent of the General Plan in terms of village developments.

Lisa Stratford stated that she has owned a cabin on Viking Drive for 54 years and when she first purchased the property, she was told that a portion of it would be part of the nearby golf course and would remain open space. That may have changed over the years. She then inquired as to the reach of ladders on fire engines that will be responding to the area; that should be looked into for safety purposes in regard to the request to increase maximum building heights in the project.

Matt Clark stated that his family has lived in liberty for 130 years and they are very concerned about the availability of water in the area. He represents Spring Mountain Water Company and they have noticed a 35 percent decrease in secondary and culinary water sources in the area. He asked for data supporting the developer's claim that they have enough water to service the area and that it will not impact the availability of water for existing users in the area. He does not believe there is enough water. He then addressed Mr. Ewert's presentation regarding the project and noted that he mentioned several times that this will be a family -oriented environment; however, he does not believe that is the case when the goal is to 'jam' as many people into the village area as possible. There is nothing quaint about a 704-unit project. People will not be moving there to raise a family and, instead, the area will be predominantly used by travelers to the area. The Valley's natural resources should not be taxed by weekend visitors; rather, they should be preserved for the families that are truly interested in living in the Valley.

Gary Fulmer stated that he lives in Wolf Creek and the point of the meeting tonight should be to consider the proposed amendments to the zoning ordinance. The County has already created a village zone for Old Town Eden, New Town Eden to be followed by Nordic Valley and Wolf Creek. He appreciates what the County is trying to do, and it is reasonable to set an overall precedent for the areas in the plan that were identified as being appropriate for Village development. The focus should be on that, but other issues that have been raised specific to Nordic Valley should be addressed at another time. There have been valid issues raised by those who have spoken tonight, including building heights, density, and workforce housing, and he encouraged the Commission to table action on this application to determine if it will be possible to address the ramifications of the proposal. There are too many questions and unknowns, and the application must be refined before action is taken.

Wes Walgreen stated that he lives in the Nordic Valley area as well; he addressed water sources for the development and indicated that the population of the area will more than double of this project is approved. This will impact water, traffic congestion, and air pollution. He stated that what has been proposed cannot be called quaint; there is another development in the area that includes tall condominiums, and he does not believe anyone would drive by those and think of them as quaint. It is one of the least attractive areas of the Valley and he asked that the Commission prevent a similar project. This project will negatively impact the area rather than benefit it; he is not opposed to all development and would support something that is thoughtful and has appropriate density and aesthetic appeal. He understands change will come and people have rights to develop their land, but it should be something that will benefit the entire Valley.

Frank Knoll stated that he and his wife own a cabin next to Nordic Valley. It seems to him that the legislation is designed to not increase density throughout the Valley; if a landowner decides to sell his development rights to a developer for us in a village project, that landowner would not be able to build on his property. The way that is enforced is through a covenant between the landowner and the County. He asked how the County would be prevented from changing its mind in the future and allowing that land to be developed. When considering amending the zoning ordinance, the Commission should add a provision that is more easily enforced to prevent development of a property from which development rights have been transferred. He echoed the concerns about the impact that this project will have on water availability in the area; the role of government is to ensure that development is responsible and the interest of those who already live in the Valley are protected.

Corey Cousins stated that this project will not impact him yet, but it will in the future. He is very concerned about the impact that project will have on water sources in the area, and he asked who will pay for the improvements to the water and sewer systems that will be needed to handle the project. He expects that all residents of the Valley will ultimately pay those costs.

There were no additional persons appearing to be heard.

Commissioner Burton moved to close the public hearing. Commissioner Montgomery seconded the motion, all voted aye.

Chairman Shuman invited staff to address some of the points raised during the public hearing.

Mr. Ewert first addressed the concerns that redlines to the ordinance were not posted for public review prior to tonight's meeting; he stated that is a great concern and he will post that material for public review. He addressed the request to increase the maximum building height, noting this is a change that was requested by the developer and one that staff is comfortable with. He

then referenced TDRs, steep slopes, rights-of-way, and streams; prior to reviewing and updating the Ogden Valley General Plan, he had the opportunity to review all platted subdivision in the Ogden Valley dating back to the 1970s. He used this as an opportunity to calculate resulting density under existing zoning. If all property lines on the existing Valley floor were erased and everything was configured to be three acres, or multi-family development in the CVR-1 zone, and even forty-acre lots with one dwelling unit in the F-40 zones. The total number of dwelling units that could be built is upwards of 26,000. Existing zoning entitles landowners to certain development opportunities. He noted he reviewed cluster subdivisions in comparison with standard subdivisions. Prior to 2015, the County allowed bonus density in cluster subdivisions as an incentive to encourage a developer to opt for a cluster subdivision to reduce the cost and impact of infrastructure and preserving some open space. When he considered all development rights resulting from clustering versus traditional subdivisions, cluster subdivisions actually had a 25 percent 'haircut'; this is because traditional subdivisions do not have to consider slopes and waterways and they actually result in increased development than in a cluster subdivision with bonus densities. If the County were to allow the mountainside to develop under the traditional one-unit per three-acres development rule, the person that chooses to do the development will try to maximize their development to maximize their return. He stated the hillside across from Nordic Valley is being developed, not at the maximum density, but the developer has been able to find ways to cut roads into the project area. He stated there are roads that were cut into the mountainside to install the poles for the ski lifts, and it could be possible to find a way to use those roads to access any other part of the mountainside to construct a home. He encouraged review of homes in Deer Valley or areas of California where there are steep slopes; if someone has money and willpower, they will build homes in steep areas. That is why slopes were not considered in the definitions of base density. People buy and sell land all the time to increase their development capacity, and that is why lot averaging and street connectivity has been considered in the zoning ordinances. He stated he knows that density is scary and considered to an enemy, but change is inevitable and will bring impacts. The County can consider ways to mitigate those impacts and he discussed a few options. He has heard concerns about water, pollution, traffic congestion, and visual impacts; density is not the problem, but the impacts created by density are the problem and there are ways to address those impacts directly. He encouraged the Commission and the public to consider what the actual impacts are and how to deal with those impacts. He is not suggesting that the Commission grant the developer's request for 763 development rights; as he and Mr. Perkes performed calculations for density, they did not arrive at the 763 number, but they did calculate a number above 600. This is done by taking total acreage and dividing it by three. He then stated that workforce housing is a challenging issue; it is known that workforce housing is needed in the Valley to prevent all workers from driving Ogden Canyon on a daily basis; there must be a way to locate workers in the Valley and some do not want people who earn less than them living in their backyard. He understands the opposition to those changes, and he agrees with the concern about Powder Mountain relying upon workforce housing in this village area. It is necessary to find ways to spread the workforce housing demand throughout different villages rather than concentrating it in one location. One of the reasons that workforce housing has not been counted towards density is because the market will regulate the amount of workforce housing in a development. Workforce housing does not pay for itself or the needed infrastructure. The answer to the water concerns is easy, but it is not one that people like to hear. A building permit will not be issued unless an applicant can prove that they have adequate water. The County can approve this type of application and the applicant will eventually need to provide proof of a water source to the agencies that will sign off on a building permit. He emphasized that no building permits will be issued until those agencies approve the project; this is different than the process that someone drilling a new well needs to follow. He concluded that just because someone is granted a zone change does not mean the project will come to fruition as there are many other things to address before proceeding with construction. He then stated that many have said this is too much density for this area; that may be true, but there is some subjectivity to that statement, and it is within the Commission's purview to determine which subjective point of view should be accepted. He then stated that some questioned why the zone must change if the project complies with the General Plan; it is important to understand that the General Plan is not the same as zoning. The General Plan provides guidance on zoning, but the existing zoning regulates the land at present. He addressed concerns about roads to the village; a transportation study has been performed and indicates that the level of service on existing streets is adequate. However, staff is unsure they agree with that position, and they have been working with the developer to identify needed improvements to Nordic Valley Drive and 3300 North; they are also considering a round-about on Highway 162 where it peels off towards the resort to mitigate the safety concerns at the "y" intersection in that area. The County has an Impact Fee Facilities Plan and the developer will need to pay impact fees for commercial and residential units that will be used to perform improvements required by the project. This includes storm water, transportation, and trail improvements, but not sewer at this time. He referenced the claim that there is no definition of base density in the land use code and noted that is not accurate. Base density is defined and any reference to 25 or 30 percent slopes has been removed from the document; this change in the code occurred a few years ago and the individual that made that comment may be reading from an old version of the land use code. There are other villages that can absorb some of the density from the Valley floor and it may be possible to set an upper threshold for the maximum density of the area. Staff understood that the residents were supportive of transferring development rights from the Valley floor to the village areas, but if that is no longer the case, the General Plan should be changed as the intention of the Plan is to clear units from the Valley floor. He then addressed the comments about wastewater

treatment in the open spaces; staff would not want to see a facility included in an open space area that would be large enough that it would eliminate the actual open space. That is why the footprint is limited when being built on open space. The developer is performing a study to determine the best location for the treatment facility, but their current plan is to build an indoor facility. The concern about using wastewater to make snow is valid and he would like to get more information about that; there are issues involved with reusing the water and Weber Basin Water Conservancy will need to provide input on that matter. He addressed hard surface parking areas and stated there are challenges associated with existing parking; the owner of the ski resort and the developer of this proposed project are not the same individual and there have been issues associated with existing parking conditions. He stated that Mr. Fulmer referenced the need to be consistent throughout all village areas in the Valley and that is actually what staff is attempting to do; the Form Based Village Zone is a tool that would require less staff resources when compared to individual development agreements for all village areas. He stated that someone asked about how the County will enforce TDR covenants; this is a legislative matter and is the same as asking for assurance that government will never change zoning of a parcel. The answer is that it is not possible to ensure that as the County has legislative authority, under the Constitution of Utah, to make such changes in the future with or without public consent. The benefit, however, of the legislative intent behind the covenant is that it will always be on the public record and will be considered anytime someone petitions to remove the restriction from their property. He agreed that pollution is a concern and wood burning stoves can be prohibited from new construction with a code amendment. He also referenced the concern about light pollution; the County has discussed the possibility of gigantic chandeliers in large picture windows in a large home that overlooks properties below. The County Commission has not yet modified the land use ordinance to regulate that, but it may be possible to recommend a code amendment based upon increasing concerns. The last question he addressed was that of who will be financially responsible to install improvements needed; the answer is that the developer will pay those costs. They must have a private contract with utility providers to extend lines to the area. Roads will be further evaluated to determine what improvements are needed to ensure the current level of service is preserved; any improvements will be paid for by the developer. One thing that would better the community is the creation of a public infrastructure district; this would create a certain tax that will be charged to property owners within the district and the revenue of that tax would be used to reinvest in infrastructure.

Vice Chair Francis asked about the comment about the manner in which hotel and condominium units are calculated towards total density of the project. Mr. Ewert stated that the person who made that comment does not understand how the zoning ordinance is being applied to the application. Staff has not made any promises about the manner in which hotel or condominium units will be counted and, at present, one condominium unit is considered to be one full unit, not a half-unit. No decision has been made about hotel rooms. Vice Chair Francis asked if the Commission can make decisions regarding the unit calculations, to which Mr. Ewert answered yes. He stated the DRR-1 zone currently communicates unit calculations and the applicant has asked for the creation of a DRR-2 zone that would closely mirror the DRR-1 zone directives.

Chairman Shuman invited the applicant to re-address the Commission.

Mr. Langvardt stated that Mr. Ewert has adequately addressed most of the concerns that have been raised. He stated that he understands the concerns that have been raised about traffic, water, sewer, and density, but he believes that most of the concerns can be addressed and mitigated throughout the development process. He stated that density calculations continue to shift and the manner in which hotel rooms will be calculated for purposes of overall density is yet to be determined. The 763-unit number that has been thrown out is somewhat misleading; a condominium in four-story building that is stacked on three other units is not the same as an 8,000 square foot home on the hillside. It uses much less land space and water than a traditional single-family home. He stated that he thinks the request for three-dimensional imagery of the proposed project is great and his team has begun working on that. He feels it would be helpful in illustrating how the project will look and the impact it will have on existing residents. He then stated that many terms used in development are subjective; he is trying to create a four-season resort in which housing units are clustered and he believes what he is proposing could actually be defined as 'small'. He addressed the request for maximum building height; he has asked for five extra feet to accomplish some desires relating to the architecture of the project, but it may not be worth the fight to proceed with that increase. He is in conversations with residents in the area about possible conservation of the open space near Viking Drive; he is also considering opportunities for preserving access to the ski resort for those presently living in the area. He feels that he has two options; he can either pursue the rezone or develop under the current zone. The rezone would give him more flexibility to pull some of the density out of the south village area. He is seeking guidance from the Commission, and he thanked them for their time tonight. He asked if the Commission will still proceed to the work session item. Chairman Shuman stated the Commission will forego the work session item tonight; he feels that the work session item was discussed as part of this agenda item. Mr. Langvardt agreed.

Mr. Perkes stated that he anticipates that this project will be included on the April 5 agenda for further discussion.

Commissioner Burton stated he feels the Commission needs additional time to consider the details of the proposal as well as the public feedback they received tonight. His only concern about Form Based Village Zoning is that it is too 'in the weeds'; it is important to provide flexibility to adapt to changes in architecture and development trends.

Commissioner Burton moved to table application ZTA 2021-07 – application to amend the Form-Based Village zoning ordinance along with other sections of the Weber County Land Use Code to add provisions and exhibits intended to create a Nordic Valley Village Area.

Chairman Shuman asked if the Commission would need to hold another public hearing on April 5. Mr. Perkes stated that the public hearing requirement has been satisfied tonight, but the Commission can decide whether to hold an additional public hearing on April 5.

Commissioner Francis seconded the motion to table.

Commissioner Lewis stated that this concept if very difficult to understand and he feels that Mr. Ewert's presentation was very articulate and explained well the purpose of the village in terms of removing density from the Valley floor. The question is where 16,000 development units will be hidden throughout the Valley; it is difficult to understand how those units will fit in the village areas throughout the Valley. As a resident and developer who lives in the Valley, he implored everyone to keep in mind that nothing the Commission does should increase the density of the Valley; developers do not need bonuses or deals on hotel rooms. Rather, property rights must be considered, and he feels form-based zoning is a good tool for addressing these issues.

Chairman Shuman then called for a vote on the motion. Commissioners Francis, Burton, Howell, Lewis, Montgomery, Shuman, and Torman all voted aye. (Motion carried 7-0).

Chairman Shuman then stated that he likes the idea of villages as they are a great tool for accommodating density and spreading it throughout the Valley. He feels that the input from the community can be considered in further adjustments to the zone and that is why he voted to table the application this evening. He then reiterated that the work session item will be postponed until the April 5 meeting. Planning Director Grover asked if the Commission wants to hold the work session on April 5 and schedule another meeting or public hearing following that date to consider application ZTA 2021-07, which has been tabled. Chairman Shuman stated he would like to hold a work session before voting on the ZTA 2021-07 application. Vice Chairman Francis agreed. Chairman Shuman polled the Commission regarding their scheduling preferences; the group concluded to hold a work session on April 5 to discuss the project and another public hearing on April 26 to consider action on the ZTA application and the ZMA 2021-09 application. Mr. Grover invited the Commission to send any additional concerns or questions they have to Planning staff in advance of the April 5 work session meeting. There was continued discussion about shifting the location of the meeting to be more accommodating to residents who live in the Valley; Mr. Grover stated he will look into that option, but it may be difficult to secure a location with short notice.

4. Work Session

4.1 ZMA 2021-09 – Work Session to discuss an/or take action on an application to rezone approximately 510 acres of land owned by Skyline Mountain Base, LLC in and around the Nordic Valley ski area to the Form-Based Village Zone. **Staff Presenters: Scott Perkes & Charlie Ewert**

This item was postponed until April 5.

5. Public Comment for items not on the agenda

Phil Swanson stated he is a North Ogden resident; he stated the temperature in the meeting room is very hot and it was uncomfortable for people to stay in the meeting for over four hours with uncirculated air.

Jan Fulmer thanked the Commission for their time and efforts considering difficult issues such as those presented tonight. She then stated there can be developers wanting extra development units for many different reasons; however, if this type of request

comes before the Commission, the Commission should consider requiring the developer to find development units that can be transferred from owners having development units on buildable land as determined by a geological survey. The developer and the owner can agree on compensation for the development rights, and this will help maintain the threshold of the projected Valley buildout on the Valley floor, which is included in the Ogden Valley General Plan. She asked that the Commission not agree to bonus development units; bonus development units were added as an amendment to the Ogden Valley General Plan by the Weber County Commissioners with no input from Ogden Valley residents. This action was done behind closed doors. When thinking of all the public meetings held on the General Plan, never once did the Commissioners, or anyone who supported bonus density units, come forward and raise the issue at the public meeting. This is a sore spot for many residents. She then addressed actions taken during the 2022 Legislative Session; the Legislature adopted laws regarding affordable dwelling units. This will create a lot of work for counties and municipalities to determine how many affordable units they have and how many more they must allow.

Ron Gleason addressed Mr. Grover; he has questions about lighting of the storage units, which was considered earlier in the meeting. He has emailed his questions, but they were not addressed. He is concerned about measuring the kelvin of the lights installed as the applicant has asked to install lights that will produce 4,000 kelvins, which is above the amount allowed by the County ordinance. He asked how the County knows that the right kelvin light will be installed and what methods will be used to measure that.

Mr. Ewert stated the applicant will be required to show the County which bulb will be used in lights and the packaging will communicate the kelvin of the bulbs. The County does have the ability to gauge the temperature of the lights, but a light meter will need to be secured to perform that measurement.

Doug Weaver addressed density calculations and asked that the public have access to that information at least two weeks in advance of the April 26 meeting. Chairman Shuman stated that it may not be possible to have it published two weeks in advance of the meeting. Mr. Weaver asked that they be posted with enough time to review them before the meeting.

6. Remarks from Planning Commissioners

There were no additional remarks from Planning Commissioners.

7. Planning Director Report

Mr. Grover complimented the Commission for the manner in which they conducted tonight's meeting and interacted with the public.

8. Remarks from Legal Counsel

Mr. Erickson echoed Mr. Grover's comments.

9. Training by Legal Counsel

This item was postponed.

Meeting Adjourned: The meeting adjourned at 9:14 p.m.
Respectfully Submitted,

_____
Weber County Planning Commission

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Request for approval of a conditional use permit for a water tank located at approximately 2051 N Highway 158, Eden.
Application Type:	Administrative
File Number:	CUP 2022-03
Applicant:	John Lewis
Approximate Address:	2051 N Highway 158, Eden, UT, 84310.
Project Area:	6600 Square feet
Zoning:	FV-3
Existing Land Use:	Vacant
Proposed Land Use:	Public Utility Substation
Parcel ID:	22-040-0026
Township, Range, Section:	Township 7 North, Range 1 East, Section 33 SW

Adjacent Land Use

North:	Residential	**South:**	Vacant/Forest
East:	Vacant/Forest	**West:**	Residential

Staff Information

Report Presenter:	Tammy Aydelotte taydelotte@webercountyutah.gov 801-399-8794
Report Reviewer:	SB

Applicable Ordinances

- Weber County Land Use Code Title 104 Chapter 14 (FV-3 Zone)
- Weber County Land Use Code Title 108 Chapter 4 (Conditional Uses)
- Weber County Land Use Code Title 108 Chapter 10 (Public Utility Substations)
- Weber County Land Use Code Title 108 Chapter 2 (Ogden Valley Architectural, Landscape, and Screening Standards)
- Weber County Land Use Code Title 108 Chapter 1 (Design Review)

Background and Summary

Applicant is requesting a conditional use permit for a water tank, to transport Nordic Mountain Water to a proposed 67-lot subdivision. This proposed water tank will provide Nordic Mountain Water to two phases of Osprey Ranch Subdivision that is currently under subdivision review.

The application is being processed as an administrative review due to the approval procedures in Uniform Land Use Code of Weber County, Utah (LUC) §108-1-2 which requires the planning commission to review and approve applications for conditional use permits and design reviews.

Analysis

General Plan: As a conditional use, this operation is allowed in the FV-3 Zone. With the establishment of appropriate conditions as determined by the land use authority, this operation will not negatively impact any of the goals and policies of the General Plan.

Zoning: The subject property is located within the FV-3 zone. The purpose and intent of the FV-3 zone are described in LUC 104-14-1:

> The purpose of the Forest Valley Zone, FV-3 is to provide area for residential development in a forest setting at a low density, as well as to protect as much as possible the naturalistic environment of the development.

The FV-3 zone allows the proposed use, as a conditional use in the FV-3 zone. The proposed site plan indicates that the water tank will be at least 30 feet from the north side lot line, 55 feet from the rear lot line, 40 feet from the south side lot line, and approximately 99 feet from the front lot line.

Under the LUC 108-10, there is not minimum lot area for public utility substations. The proposed improvements will be located on a site of approximately 6600 square feet.

Conditional Use Review: A review process has been outlined in LUC §108-4-3 to ensure compliance with the applicable ordinances and to mitigate anticipated detrimental effects. The applicant has received approval from the County Engineering Division and the Weber Fire District for the proposal.

The following is an analysis of the proposal reviewed against the conditional use standards:

(1) Standards relating to safety for persons and property. The proposal is not anticipated or expected to negatively impact this property, surrounding properties, or persons. The applicant plans berm around the above-ground tank, to minimize the visual impact to neighboring properties, and to re-seed any areas disturbed by construction in order to maintain the native vegetation.

(2) Standards relating to infrastructure, amenities, and services: The proposal is not anticipated or expected to negatively impact any existing infrastructure, amenities, or services in the area.

(3) Standards relating to the environment. The proposal is not anticipated or expected to negatively impact the environment.

(4) Standards relating to the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan. The proposal is not anticipated to negatively impact the surrounding area, nor is it contrary to the recommendations of the general plan.

Design Review: The proposed conditional use mandates a design review as outlined in LUC §108-1 to ensure that the general design, layout and appearance of the building remains orderly and harmonious with the surrounding neighborhood. The matters for consideration are as follows:

Considerations relating to traffic safety and traffic congestion. The proposal includes a site plan that identifies an access to the pump house off of a proposed new road in phase two of the proposed Osprey Ranch Subdivision. Neither traffic safety hazards nor traffic congestion are anticipated given the minimal site visitations to the substations.

Considerations relating to landscaping. The site consists of natural landscaping that meets the requirements outlined in the Architectural, Landscape, and Screening Design Standards (108-2).

Considerations relating to buildings and site layout. The applicant has indicated the water tank will be located in an underground vault. There will be nothing above ground. The proposed tank will be made entirely of concrete which also complies with applicable aesthetic requirements.

Review Agencies: Weber Fire District has approved this application. Weber County Engineering has not yet reviewed this application, and a conditional use permit will not be issued until all required review agencies have their conditions met.

Staff Recommendation

Staff recommends approval of this conditional use application subject to the applicant meeting the review agency requirements and the following conditions:

1. Any outdoor lighting must meet the requirements of the Ogden Valley Outdoor Lighting Ordinance (108-16).
2. All recommendations contained in the submitted geo reports shall be followed.

This recommendation is based on the following findings:

1. The proposed use is allowed in the FV-3 zone and meets the appropriate site development standards.
2. The criteria for issuance of a conditional use permit have been met because mitigation of potential detrimental effects can be accomplished.

Exhibits

A. Building elevations and Site Plan
B. Application and Narrative
C. Geotech Report and Geologic Hazards Study

Map 1

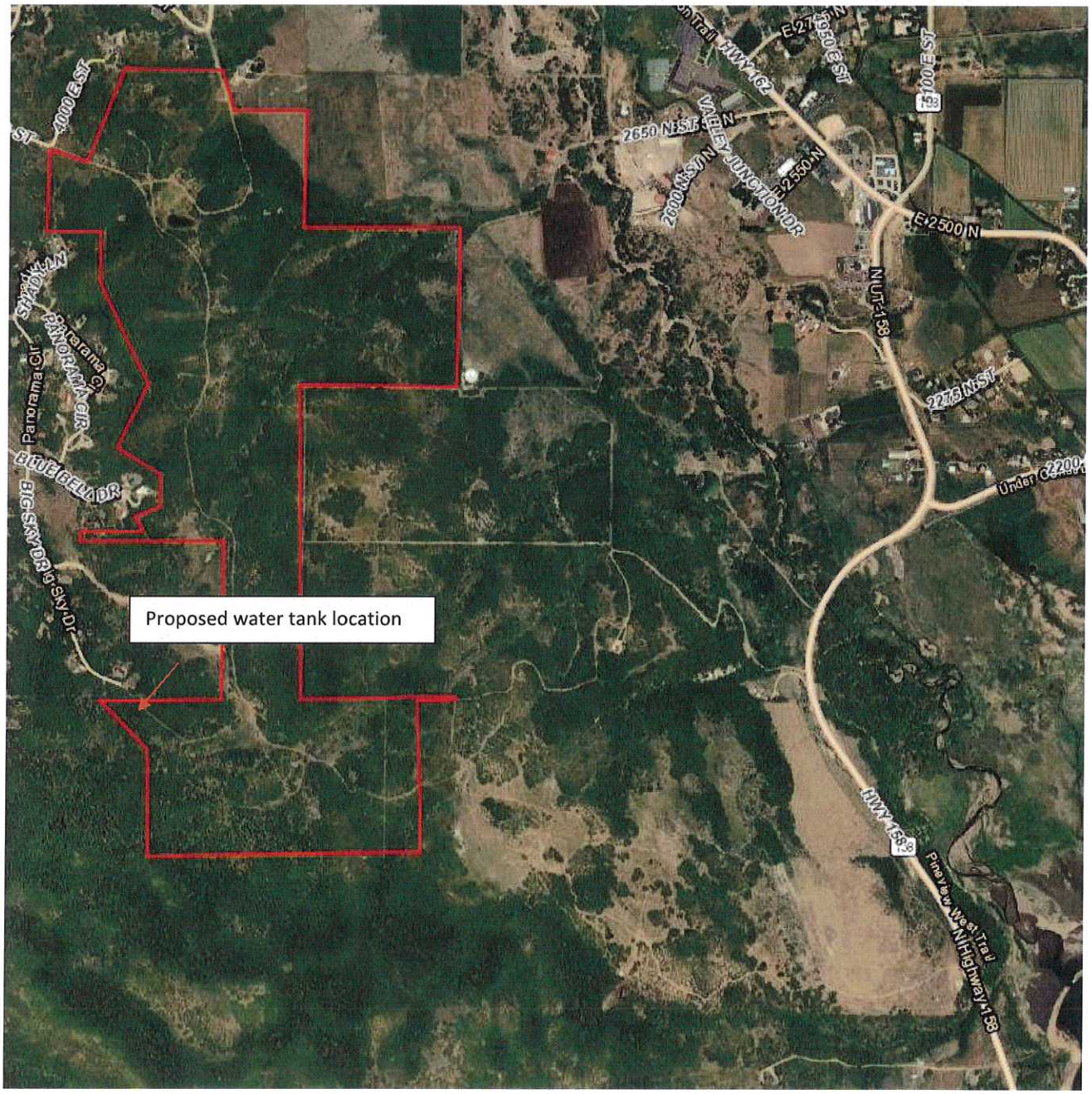


Exhibit A –Site Plan

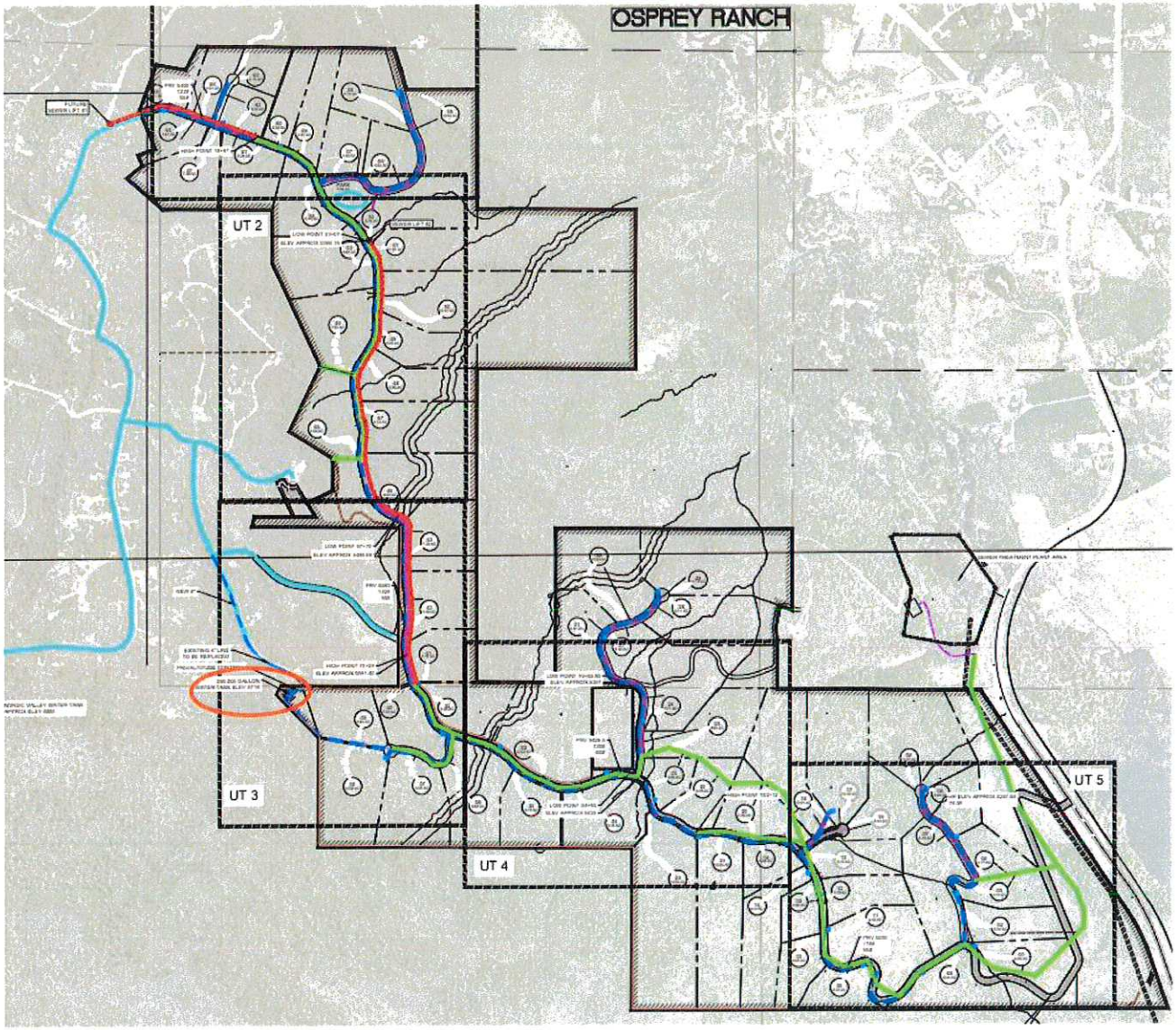


Exhibit B – Application and Narrative

Lewis-John-Conditional Use Permits

+ Add Follower | Change Status | Edit Project

Address:	2051 N Highway 158, Eden, UT, 84310
Maps:	Google Maps
Project Type:	Conditional Use Permits
Sub Type:	Conditional Use Permits
Created By:	Taylor Lewis
Created On:	3/9/2022
Project Status:	Accepted
Status Date:	4/22/2022
File Number:	CUP 2022-03
Project Manager	Tammy Aydelotte

Application | Documents 9 | Comments 1 | Reviews 1 | Followers 7 | Status | Notifications | Payments 1

Application

+ Add Building | + Add Parcel | + Add a Contractor | Edit Application | Print

Project Description	A 250,000 water tank that will provide service to the future Osprey Ranch subdivision.
Property Address	2051 N Highway 158 Eden, UT, 84310
Property Owner	John Lewis 801-430-1507 john@wolfcreekresort.com
Representative	Taylor Lewis 949-682-6127 taylor@wolfcreekresort.com
Accessory Dwelling Unit	False
Current Zoning	FV-3
Subdivision Name	Osprey Ranch Phase 1
Number of Lots	
Lot Number	
Lot Size	
Frontage	
Culinary Water Authority	Nordic Mountain Water Incorporated
Secondary Water Provider	
Sanitary Sewer Authority	
Nearest Hydrant Address	
Signed By	Representative, Taylor Lewis

Parcel Number

Remove 220400026 - County Map

Narrative:

Osprey Water Tank Narrative

The proposed water tank, sitting on the south-western end of the property, will provide service to the entire two-phased Osprey Ranch subdivision (67 lots), located a short distance west of Pineview Reservoir. Designed by ARW Engineers, this tank will sit above ground with a surrounding berm to minimize its visual impact, landscaped with native vegetation. The tank, at 70 feet in diameter, will feature a water capacity of 250,000 gallons. The water will be provided by Nordic Mountain Water Inc. One of Bowen Construction or Geneva Rock (bid pending) will be tasked with its construction.

Exhibit C – Geotech Report and Geologic Hazards Study

See Attached.

Geotechnical Investigation
Proposed Water Reservoir
Osprey Ranch Development
Eden, Weber County, Utah

January 7 2021

Prepared by:

Christensen Geotechnical
8143 South 2475 East, South Weber, Utah

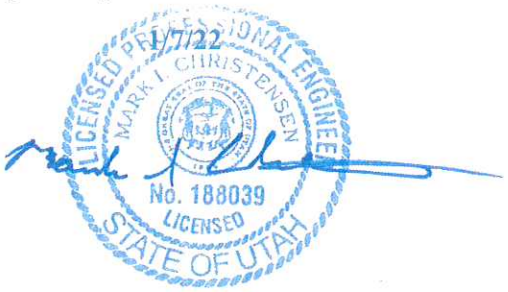
Christensen
Geotechnical
8143 South 2475 East South Weber, Utah 84405
Phone: 801 814-1714

Prepared for:

Lewis Homes
Attn: John Lewis
3718 North Wolf Creek Drive
Eden, Utah 84310

Geotechnical Investigation
Proposed Water Reservoir
Osprey Ranch Development
Eden, Weber County, Utah
CG Project No.: 133-014

Prepared by:



Mark I. Christensen, P.E.
Principal

Christensen Geotechnical
8143 South 2475 East
South Weber, Utah 84405

January 7, 2022

TABLE OF CONTENTS

ATTACHED PLATES

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF WORK

This report presents the results of a geotechnical investigation that was performed for a proposed water reservoir which is to be constructed for the Osprey Ranch development. The development is to be located in Eden, Weber County, Utah. The general location of the project is indicated on the Project Vicinity Map, Plate 1. In general, the purposes of this investigation were to evaluate the subsurface conditions and the nature and engineering properties of the subsurface soils, and to provide recommendations for general site grading and for the design and construction of concrete slabs and foundations. This investigation included subsurface exploration, representative soil sampling, field and laboratory testing, engineering analysis, and preparation of this report. Prior to the completion of our report, the Geologic Hazards Evaluation for the development by Western Geologic, dated January 3, 2022, was reviewed to assist in our assessments. The work performed for this report was authorized by Mr. John Lewis.

1.2 PROJECT DESCRIPTION

Based on conversations with our client, we understand that the proposed construction at the site is to consist of a concrete water reservoir. The proposed reservoir is to have an approximate 250,000-gallon capacity and is to be partially buried. The footing loads for the proposed reservoir are anticipated to be on the order of 3 to 6 klf for walls and up to 200 kips for columns. If the actual structural loads are different from those anticipated, Christensen Geotechnical should be notified in order to reevaluate our recommendations.

2.0 METHODS OF STUDY

2.1 FIELD INVESTIGATION

The subsurface conditions at the site were explored by excavating one test pit at the site of the water reservoir. The test pit was excavated to a depth approximately of 7½ feet below the existing site grade. The approximate test pit location is shown on the Exploration Location Map, Plate 2. The subsurface conditions as encountered in the test pit were recorded at the time of excavation and are presented on the attached Test Pit Log, Plate 3. A key to the symbols and terms used on the Test Pit Logs may be found on Plate 4.

The test pit excavation was accomplished with a tracked excavator. Disturbed samples were collected from the test pit sidewalls at the time of excavation which were placed in bags and buckets. The samples were visually classified in the field and portions of each sample were packaged and transported to our laboratory for testing. The classifications for the individual soil units are shown on the attached Test Pit Logs.

2.2 LABORATORY TESTING

Of the soils collected during the field investigation, representative samples were selected for testing in the laboratory in order to evaluate the pertinent engineering properties. The laboratory testing performed included a moisture content determination and a partial gradation analysis. A summary of our laboratory testing is presented in the table below:

Table No. 1: Laboratory Test Results

Test Hole No.	Depth (ft.)	Dry Density (pcf)	Moisture Content (%)	Atterberg Limits		Grain Size Distribution (%)			Soil Type
				LL	PI	Gravel (+#4)	Sand	Silt/Clay (- #200)	
TP-67	6		3.9			67.2	20.0	12.9	GC

The results of our laboratory tests are also presented on the Test Pit Log, Plate 3, and more detailed laboratory results are presented on the laboratory testing plate, Plate 5.

The samples will be retained in our laboratory for 30 days following the date of this report, at which time they will be disposed of unless a written request for additional holding time is received prior to the disposal date.

3.0 GENERAL SITE CONDITIONS

3.1 SURFACE CONDITIONS

At the time of our investigation, the subject site was undeveloped land located in the foothills of the mountains above Eden, Utah. The site generally sloped down to the northeast at grades of 5 to 15 percent. The vegetation at the site consisted of dense trees with common grasses and weeds.

3.2 SUBSURFACE CONDITIONS

3.2.1 Soils

Based on the test pit excavated at the site of the water reservoir, the subsurface materials consisted of approximately 1 foot of topsoil and 1 ½ feet of Clayey GRAVEL with sand (GC) overlying conglomerate bedrock. The bedrock was weathered to slightly weathered and moderately strong to strong, with the bedrock strength increasing with depth.

3.2.2 Groundwater

Groundwater was not encountered within our test pit at the time of excavation. It should be understood that groundwater is likely below its seasonal high and may fluctuate in response to seasonal changes, precipitation, and irrigation.

4.0 SEISMIC CONSIDERATIONS

4.1 SEISMIC DESIGN CRITERIA

The State of Utah and Utah municipalities have adopted the 2018 International Building Code (IBC) for seismic design. The IBC seismic design is based on seismic hazard maps which depict probabilistic ground motions and spectral response; the maps, ground motions, and spectral response having been developed by the United States Geological Survey (USGS). Seismic design values, including the design spectral response, may be calculated for a specific site using the web-based application by the Applied Technology Council (ATC), the project site's approximate latitude and longitude, and its Site Class. Based on our field exploration, it is our opinion that this location is best described as a Site Class C, which represents a "very dense soil and soft rock" profile. The spectral acceleration values obtained from the ATC's web-based application are shown below.

Table 2: IBC Seismic Response Spectrum Values

Site Location: 41.29303° N -111.84996° W	
Name	**Response Spectral Value**
S_S	**1.013**
S_1	**0.364**
S_{MS}	**1.215**
S_{M1}	**0.546**
S_{DS}	**0.810**
S_{D1}	**0.364**
PGA	**0.45**
PGA_M	**0.54**

4.2 LIQUEFACTION

Certain areas in the intermountain west possess a potential for liquefaction. Liquefaction is a phenomenon in which soils lose their intergranular strength due to an increase of pore pressures during a dynamic event such as an earthquake. The potential for liquefaction is based on several factors, including 1) the grain-size distribution of the soil, 2) the plasticity of the fine fraction of the soil (material passing the No. 200 sieve), 3) the relative density of the soils, 4) earthquake strength (magnitude) and duration, 5) overburden pressures, and 6) the depth to groundwater. Due to the shallow bedrock at this site, we assess the liquefaction potential to be very low.

5.0 ENGINEERING ANALYSIS AND RECOMMENDATIONS

5.1 GENERAL CONCLUSIONS

Based on the results of our field and laboratory investigations, it is our opinion that the subject site is suitable for the proposed construction provided that the recommendations contained in this report are incorporated into the design and construction of the project.

5.2 EARTHWORK

5.2.1 General Site Preparation and Grading

Prior to the site grading operations, all vegetation, topsoil, undocumented fill soils, and loose or disturbed soils should be stripped (removed) from the reservoir pad and flatwork concrete areas. Following the stripping operations, the exposed soils should be proof rolled to a firm, unyielding condition. Site grading may then be conducted to bring the site to design grade. Where over-excavation is required, the excavation should extend at least 1 foot laterally for every foot of over-excavation. A Christensen Geotechnical representative should observe the site grading operations.

5.2.2 Temporary Construction Excavations

Based on OSHA requirements and the soil conditions encountered during our field investigation, we anticipate that temporary construction excavations at the site that have vertical walls that extend to depths of up to 5 feet may be occupied without shoring; however, where groundwater or fill soils are encountered, flatter slopes may be required. Excavations that extend to more than 5 feet in depth should be sloped or shored in accordance with OSHA regulations for a type A soil. The stability of construction excavations is the contractor's responsibility. If the stability of an excavation becomes questionable, the excavation should be evaluated immediately by qualified personnel.

5.2.3 Structural Fill and Compaction

All fill that is placed for the support of reservoir and concrete flatwork should consist of structural fill. The structural fill may consist of the native gravel soil and the native conglomerate bedrock if it is crushed to a maximum particle size of 4 inches. Imported structural fill, if required, should consist of a relatively well-graded granular soil with a maximum particle size of 4 inches, with a maximum of 50 percent passing the No. 4 sieve and with a maximum of 30 percent passing the No. 200 sieve. The liquid limit of the fines (material passing the No. 200 sieve) should not exceed 35 and the plasticity index should be less than 15. Additionally, all structural fill, whether native

soils or imported material, should be free of topsoil, vegetation, frozen material, particles larger than 4 inches in diameter, and any other deleterious materials. Any imported materials should be approved by the geotechnical engineer prior to importing.

The structural fill should be placed in loose lifts that are a maximum of 8 inches thick. The moisture content should be within 3 percent of optimum and the fill should be compacted to at least 95 percent of the maximum density as determined by ASTM D 1557. Where the fill heights exceed 5 feet, the level of compaction should be increased to 98 percent.

5.2.4 Excavatability

As indicated earlier, conglomerate bedrock was encountered within our test pit at a depth of 2 ½ feet below existing site grade. This bedrock was generally in a moderately strong to strong condition, with strength increasing with depth. We anticipate that the minimum equipment required for excavations within the bedrock will be the use of a heavy excavator with a ripper tooth or a hoe-ram. Prior to bidding, the contractor should be provided with this report in order to be made aware of the subsurface conditions so that they can assess the type of equipment that will be best suited for these conditions.

5.2.5 Permanent Cut and Fill Slopes

The existing slopes on the property should not be over-steepened by cutting or filling. We recommend that all non-retained cut and fill slopes be graded no steeper than a 3 to 1 (horizontal to vertical) grade. If steeper grades are required, additional slope stability assessments may be required.

5.3 FOUNDATIONS

The foundations for the planned reservoir may consist of conventional continuous and/or spread footings established either on undisturbed bedrock or on properly placed and compacted structural fill which extends down to undisturbed bedrock. The footings for the proposed structure should be a minimum of 20 inches and 30 inches wide for continuous and spot footings, respectively. The exterior footings should be established at a minimum of 30 inches below the lowest adjacent grade to provide frost protection and confinement. Interior footings that are not subject to frost should be embedded a minimum of 18 inches for confinement.

Continuous and spread footings that are established on undisturbed bedrock or structural fill may be proportioned for a maximum net allowable bearing capacity of 3,000 psf. A one-third increase

may be used for transient wind or seismic loads. All footing excavations should be observed by the geotechnical engineer prior to the construction of footings.

5.4 ESTIMATED SETTLEMENT

If the foundations are designed and constructed in accordance with the recommendations presented in this report, there is a low risk that total settlement will exceed 1 inch and a low risk that differential settlement will exceed ½ inch for a 30-foot span.

5.5 LATERAL EARTH PRESSURES

Buried structures, such as basement walls, should be designed to resist the lateral loads imposed by the soils retained. The lateral earth pressures on the below-grade walls and the distribution of those pressures will depend upon the type of structure, hydrostatic pressures, in-situ soils, backfill, and tolerable movements. Basement and retaining walls are usually designed with triangular stress distributions, which are based on an equivalent fluid pressure and calculated from lateral earth pressure coefficients. If soils similar to the native soils are used to backfill the basement walls, then the walls may be designed using the following ultimate values:

Table No. 3: Lateral Earth Pressures

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pcf)
Active Static	0.29	37
Active Seismic	0.19	24
At-Rest	0.46	57
Passive Static	3.39	424
Passive Seismic	-0.44	-55

We recommend that walls which are allowed little or no wall movement be designed using "at rest" conditions. Walls that are allowed to rotate at least 0.4 percent of the wall height may be designed with "active" pressures. The coefficients and densities that are presented above assume a level backfill with no buildup of hydrostatic pressures. If anticipated, hydrostatic pressures and any surcharge loads should be added to the presented values. If sloping backfill is present, we recommend that the geotechnical engineer be consulted to provide more appropriate lateral pressure parameters once the design geometry is established.

The seismic active and passive earth pressure coefficients provided in the table above are based on the Mononobe-Okabe method and only account for the dynamic horizontal force produced by a seismic event. The resulting dynamic pressure should therefore be added to the static pressure to determine the total pressure on the wall. The dynamic pressure distribution can be represented as an inverted triangle, with stress decreasing with depth, and the resultant force acting approximately 0.6 times the height of the retaining wall, measured upward from the bottom of the wall.

Lateral building loads will be resisted by frictional resistance between the footings and the foundation soils and by passive pressure developed by backfill against the wall. For footings on native bedrock, we recommend that an ultimate coefficient of friction of 0.40 be used. If passive resistance is used in conjunction with frictional resistance, the passive resistance should be reduced by ½. The passive earth pressure from soils subject to frost or heave should usually be neglected in design.

The coefficients and equivalent fluid densities presented above are ultimate values and should be used with an appropriate factor of safety against overturning and sliding. A value of 1.5 is typically used.

5.6 CONCRETE SLAB-ON-GRADE CONSTRUCTION

Concrete slabs-on-grade should be constructed over at least 12 inches of compacted gravel to help distribute floor loads, break the rise of capillary water, and to aid in the curing process. The gravel should consist of free-draining gravel compacted to a firm, unyielding condition. To help control normal shrinkage and stress cracking, the floor slab should have adequate reinforcement for the anticipated floor loads, with the reinforcement continuous through the interior joints. In addition, we recommend adequate crack control joints to control crack propagation.

5.7 MOISTURE PROTECTION AND SURFACE DRAINAGE

5.7.1 Surface Drainage

Any wetting of the foundation soils will likely cause some degree of volume change within the soils and should be prevented both during and after construction. We recommend that grading be performed to prevent ponding and the infiltration of surface water near the proposed reservoir. If necessary, diversion berms or ditches should be placed uphill of the reservoir to redirect runoff. In addition, we recommend adequate compaction of backfill around the reservoir walls. At a minimum, we recommend that the backfill around the tank's walls be compacted to at least 90 percent of the maximum density as determined by ASTM D 1557.

5.7.2 Reservoir Under-Drainage

Consideration should be given to constructing a drainage system below the reservoir. The drainage system should consist of an impermeable membrane, such as an HDPE liner, over which at least 6 inches of free-draining gravel should be placed. Perforated collection pipes should be installed within the free-draining gravel, and the perforated pipe and the impermeable membrane should be graded to facilitate drainage to a low point in order to assist in leak detection and to allow the discharge of collected water.

5.8 SUBSURFACE DRAINAGE

Due to the high alpine setting of the subject site, we recommend that all subgrade walls incorporate a foundation drain. The foundation drain should consist of a 4-inch-diameter slotted pipe placed at or below the bottom of footings and encased in at least 12 inches of free-draining gravel. The gravel should extend up the foundation wall to within 2 feet of the final ground surface, and a filter fabric, such as Mirafi 140N, should separate the gravel from the native soils. The pipe should be graded to drain to a free-gravity outfall. The gravel which extends up the wall may be replaced by a fabricated drain panel such as Mirafi G200N or equivalent.

5.9 SLOPE STABILITY

As recommended in the Geologic Hazards Evaluation by Western Geologic, the stability of the slope at the site was assessed using the Slide computer program and the modified Bishop's method of slices. The location of the profile is shown on Plate 2 and is based on the cross section presented in the Western Geologic report. For our analyses, we assumed that the top 5 feet of the bedrock was highly weathered. The strength of the subsurface materials there was used in our analyses was based on our experience and laboratory testing performed for the Osprey Ranch development.

The profile was assessed under static and pseudo static conditions. The pseudo static condition is used to assess the slope during a seismic event. As indicated in Section 4.1, the peak ground acceleration at this site is estimated to be 0.54g. As is common practice, half of this value was used in our pseudo static assessments. Minimum factors of safety of 1.5 and 1.0 for static and seismic conditions, respectively, were considered acceptable. Our analyses indicate that the slope in the area of the proposed water reservoir has safety factors greater than 1.5 and 1.0 for the static and pseudo static conditions. It is therefore our opinion that the proposed site is suitable for construction of the reservoir. The results of our slope stability assessments may be found on Plates 6 and 7.

The slope stability analysis presented above is based on the assumption that no significant cuts or fills will occur during the development of the site. Significant changes to the site grade, such as the steepening of slopes with cuts or fills, may adversely affect the stability of the slopes and increase the risk of slope failures. If cuts or fills over 15 feet are planned, additional slope stability assessments may be necessary and Christensen Geotechnical should be contacted to provide the additional assessments.

6.0 LIMITATIONS

The recommendations contained in this report are based on limited field exploration, laboratory testing, and our understanding of the proposed construction. The subsurface data used in this report was obtained from the explorations that were made specifically for this investigation. It is possible that variations in the soil and groundwater conditions could exist between and beyond the points explored. The nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at this site that are different from those described in this report, Christensen Geotechnical should be immediately notified so that we may make any necessary revisions to the recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, Christensen Geotechnical should be notified.

This report was prepared in accordance with the generally accepted standard of practice at the time the report was written. No other warranty, expressed or implied, is made.

It is the client's responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

The recommendations presented within this report are based on the assumption that an adequate program of tests and observations will be followed during construction to verify compliance with our recommendations. We also assume that we will review the project plans and specifications to verify that our conclusions and recommendations are incorporated and remain appropriate (based on the actual design).

7.0 REFERENCES

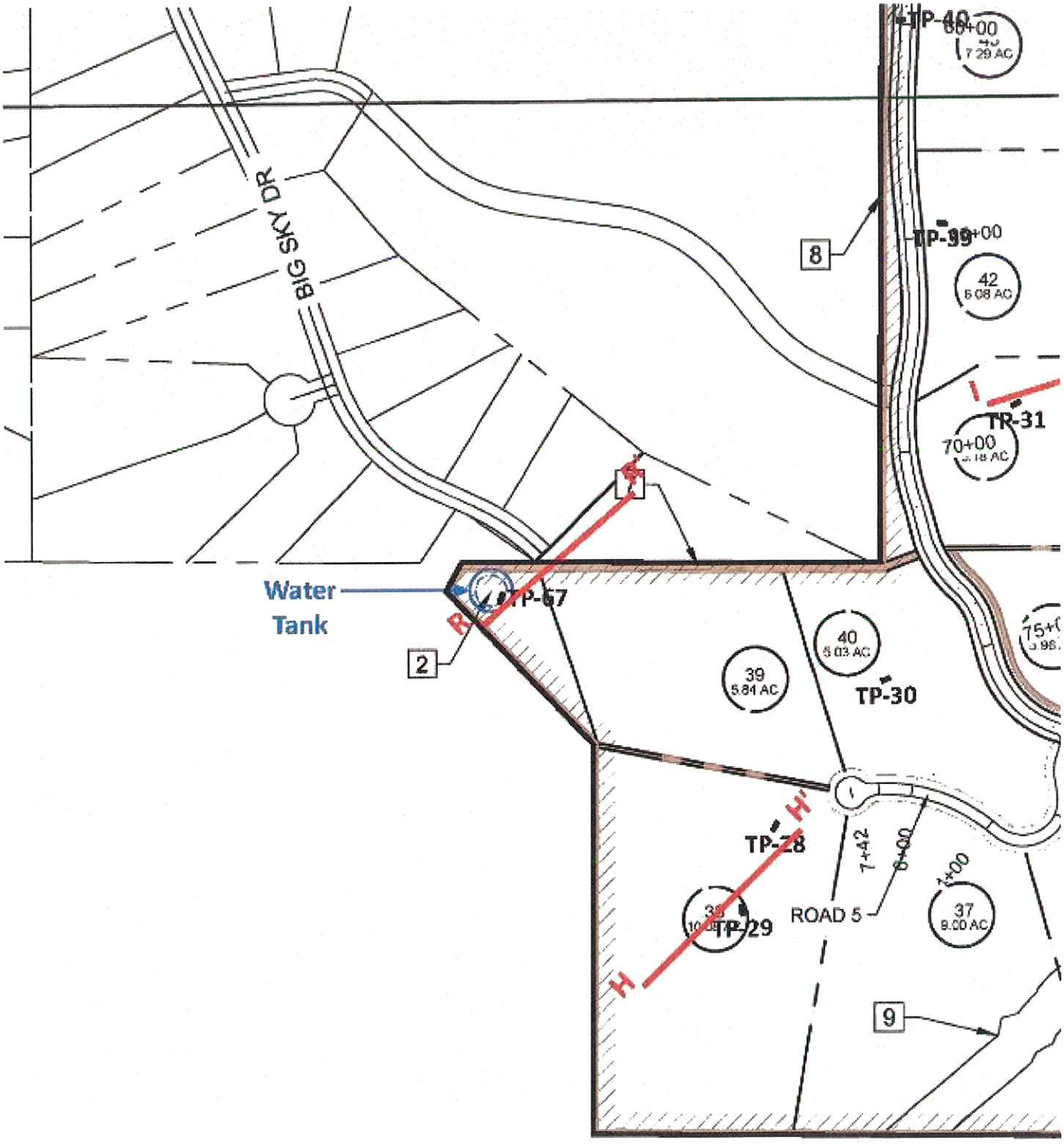
Black, Bill, January 3, 2022, "Geologic Hazards Evaluation, Proposed Osprey Ranch Development, 2050 Highway 150, Eden, Weber County, Utah," Western Geologic, consultant's unpublished report.

Base Photo: Utah AGRC

Drawing Not to Scale

N

Christensen Geotechnical	Lewis Homes Osprey Ranch Water Reservoir Eden, Utah Project No. 133-014 **Vicinity Map**	Plate 1



Base Photo: Utah AGRC

Approximate Test Pit Location

Slope Stability Profile

Drawing Not to Scale

Base Site Plan: Gardner Engineering

N

Christensen Geotechnical

Lewis Homes
Osprey Ranch Water Reservoir
Eden, Utah
Project No. 133-014

Exploration Location Map

Plate 2

Date		
Started:	11/22/2021	
Completed:	11/22/2021	
Backfilled:	---	

TEST PIT LOG

Logged By: M Christensen
Equipment: Trackhoe
Location: See Plate 2

Test Pit No.
TP-67

Depth (feet)	Sample Type	Groundwater	Graphic Log	Group Symbol	Material Description	Dry Density (pcf)	Moisture Content (%)	Minus #200 (%)	Liquid Limit	Plasticity Index
					Topsoil; Clayey GRAVEL with sand - slightly moist, dark brown					
				GC	Clayey GRAVEL with sand - medium dense, moist, brown					
					Conglomerate Bedrock - moderately strong to strong, weathered to slightly weathered, brown					
5							3.9	12.9		
					Refusal at 7½ feet on bedrock					
10										
15										

☒ Bulk/Bag Sample
▥ Undisturbed Sample
▼ Stabllized Groundwater
▽ Groundwater At Time of Excavation

Christensen Geotechnical

Lewis Homes
Osprey Ranch Water Reservoir
Eden, Utah
Project No.: 133-014

Plate
3

RELATIVE DENSITY – COURSE GRAINED SOILS

Relative Density	SPT (blows/ft.)	3 In OD California Sampler (blows/ft.)	Relative Density (%)	Field Test
Very Loose	<4	<5	0 – 15	Easily penetrated with a ½ inch steel rod pushed by hand
Loose	4 – 10	5 – 15	15 – 35	Difficult to penetrate with a ½ inch steel rod pushed by hand
Medium Dense	10 – 30	15 – 40	35 – 65	Easily penetrated 1-foot with a steel rod driven by a 5 pound hammer
Dense	30 – 50	40 – 70	65 – 85	Difficult to penetrate 1-foot with a steel rod driven by a 5 pound hammer
Very Dese	>50	>70	85 - 100	Penetrate only a few inches with a steel rod driven by a 5 pound hammer

CONSISTENCY – FINE GRAINED SOILS

Consistency	SPT (blows/ft)	Torvane Undrained Shear Strength (tsf)	Pocket Penetrometer Undrained Shear Strength (tsf)	Field Test
Very Soft	<2	<0.125	<0.25	Easily penetrated several inches with thumb
Soft	2 – 14	0.125 – 0.25	0.25 – 0.5	Easily penetrated one inch with thumb
Medium Stiff	4 – 8	0.25 – 0.5	0.5 – 1.0	Penetrated over ½ inch by thumb with moderate effort. Molded by strong finger pressure
Stiff	8 – 15	0.5 – 1.0	1.0 – 2.0	Indented ½ inch by thumb with great effort
Very Stiff	15 – 30	1.0 – 2.0	2.0 – 4.0	Readily indented with thumbnail
Hard	>30	>2.0	>4.0	Indented with difficulty with thumbnail

CEMENTATION

Weakly	Crumbles or breaks with handling or little finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

MOISTURE

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible water, usually below water table

GRAIN SIZE

Description		Sieve Size	Grain Size (in)	Approximate Size
Boulders		>12"	>12"	Larger than basketball
Cobbles		3" – 12"	3" – 12"	Fist to basketball
Gravel	Coarse	3/4" - 3"	3/4" - 3"	Thumb to fist
	Fine	#4 – 3"	0.19 – 0.75	Pea to thumb
Sand	Coarse	#10 - #4	0.079 – 0.19	Rock salt to pea
	Medium	#40 - #10	0.017 – 0.079	Sugar to rock salt
	Fine	#200 - #40	0.0029 – 0.017	Flour to sugar
Silt/Clay		<#200	<0.0029	Flour sized or smaller

STRATAFICATION

Occasional	One or less per foot of thickness
Frequent	More than one per foot of thickness

MODIFIERS

Trace	<5%
Some	5-12%
With	>12%

STRATIFICATION

Seam	1/16 to 1/2 inch
Layer	1/2 to 12 inch

NOTES

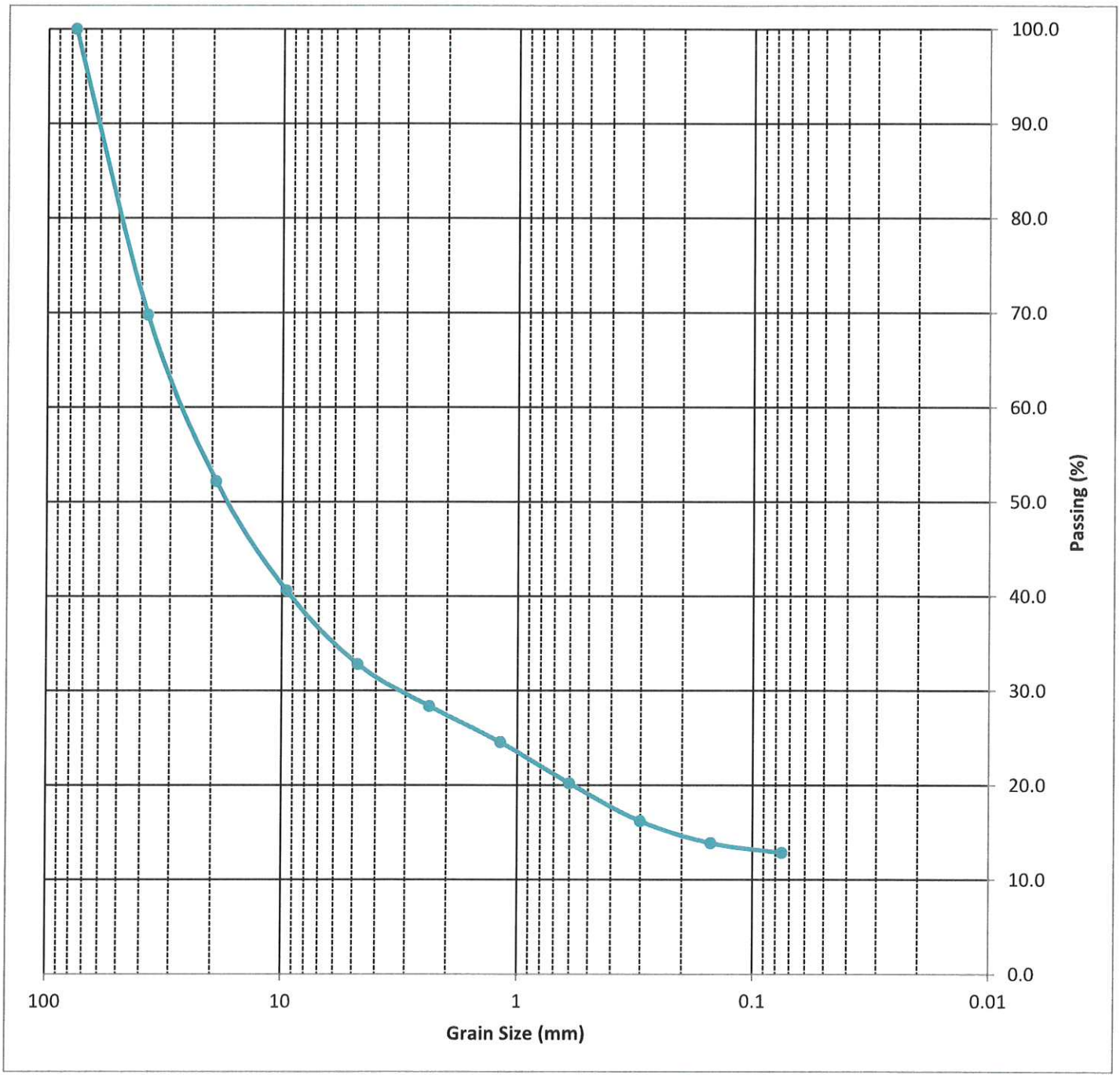
1. The logs are subject to the limitations and conclusions presented in the report.
2. Lines separating strata represent approximate boundaries only. Actual transitions may be gradual.
3. Logs represent the soil conditions at the points explored at the time of our investigation.
4. Soils classifications shown on logs are based on visual methods . Actual designations (based on laboratory testing)may vary.

Christensen Geotechnical

Soil Terms Key

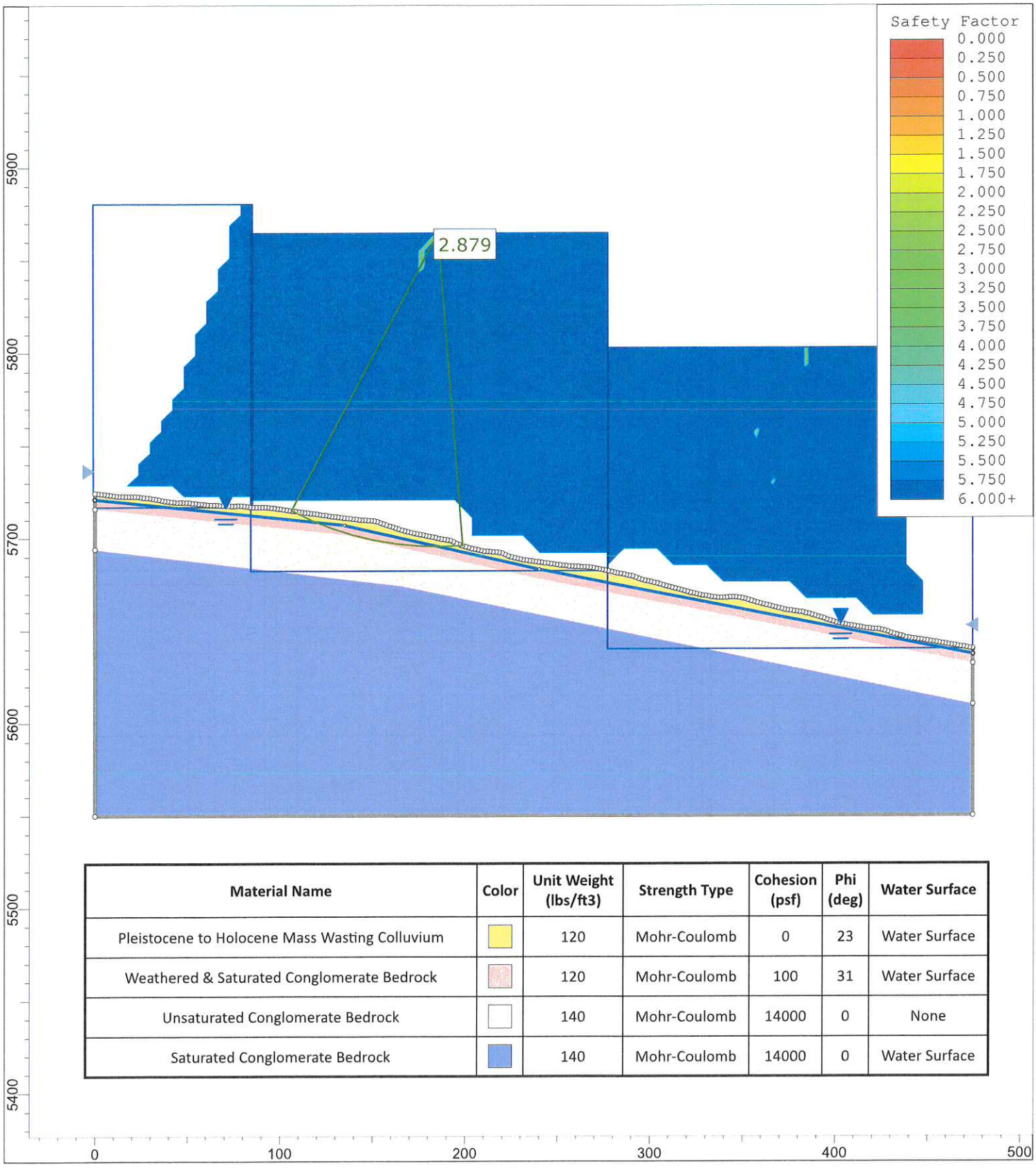
Plate 4

Grain Size Distribution



Location	Depth		Classification	% Gravel	% Sand	% Silt and Clay
TP-67	6	●	Bedrock (Clayey GRAVEL with sand)	67.2	20.0	12.9

Christensen Geotechnical	Lewis Homes Osprey Ranch Water Reservoir Eden, Utah Project No.: 133-014	Plate 5



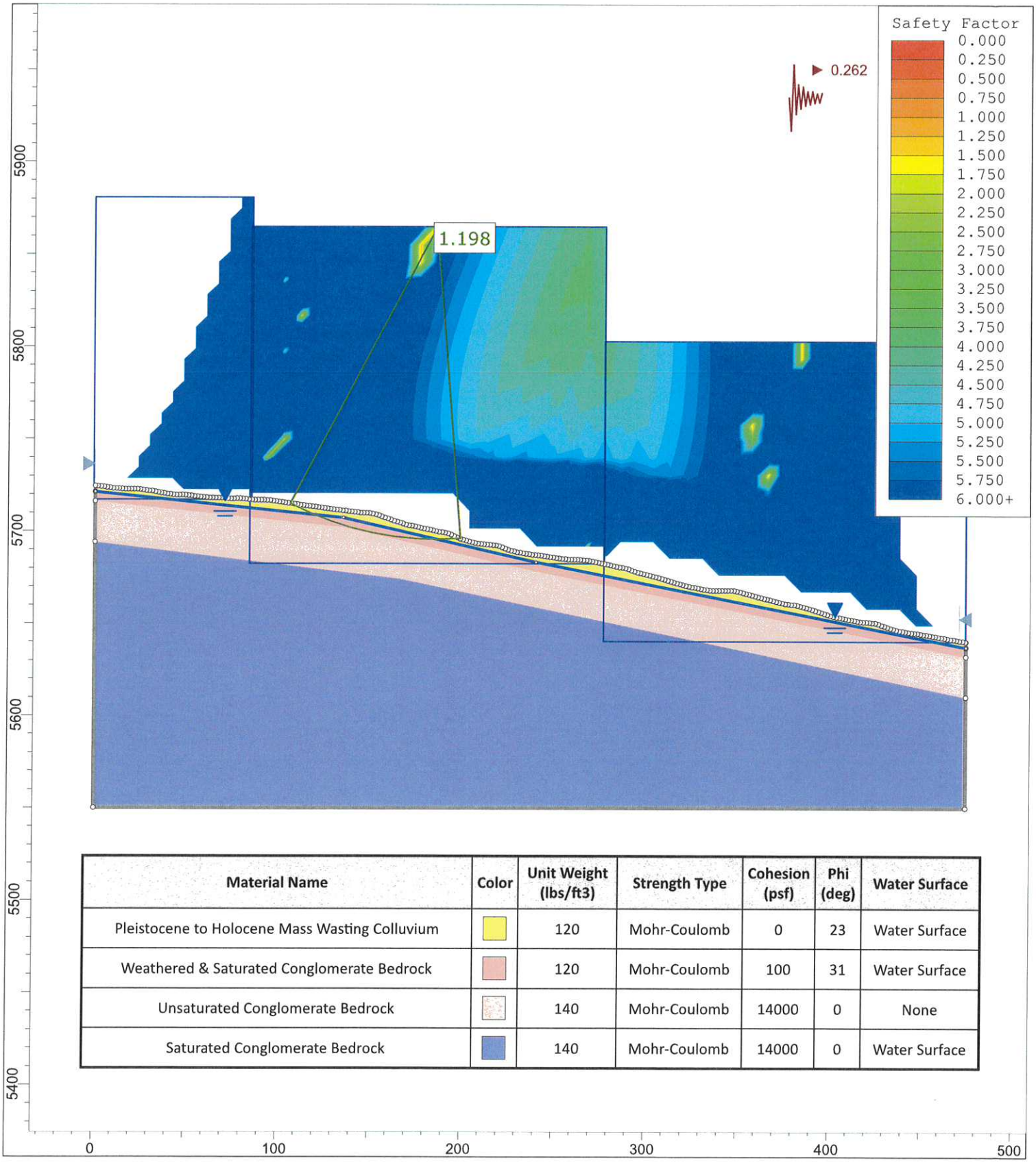
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
Pleistocene to Holocene Mass Wasting Colluvium		120	Mohr-Coulomb	0	23	Water Surface
Weathered & Saturated Conglomerate Bedrock		120	Mohr-Coulomb	100	31	Water Surface
Unsaturated Conglomerate Bedrock		140	Mohr-Coulomb	14000	0	None
Saturated Conglomerate Bedrock		140	Mohr-Coulomb	14000	0	Water Surface

Profile R - Static

Christensen Geotechnical

Lewis Homes
Osprey Ranch Water Reservoir
Eden, Utah
133-014

Plate
6



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
Pleistocene to Holocene Mass Wasting Colluvium		120	Mohr-Coulomb	0	23	Water Surface
Weathered & Saturated Conglomerate Bedrock		120	Mohr-Coulomb	100	31	Water Surface
Unsaturated Conglomerate Bedrock		140	Mohr-Coulomb	14000	0	None
Saturated Conglomerate Bedrock		140	Mohr-Coulomb	14000	0	Water Surface

Profile R - Pseudo Static

Christensen Geotechnical

Lewis Homes
Osprey Ranch Water Reservoir
Eden, Utah
133-014

Plate
7

REPORT

GEOLOGIC HAZARDS EVALUATION
PROPOSED OSPREY RANCH DEVELOPMENT
2050 HIGHWAY 150
EDEN, WEBER COUNTY, UTAH

Prepared for

Lewis Homes
3718 North Wolf Creek Drive
Eden, Utah 84310

January 3, 2022

Prepared by

Western Geologic & Environmental LLC
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Salt Lake City, UT 84106 USA

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Fax: 801.990.4601
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Phone: 801.359.7222 Fax: 801.990.4601 Email: kthomas@westerngeologic.com

January 3, 2022

Lewis Homes
Eric Householder
3718 North Wolf Creek Drive
Eden, Utah 84310

Letter of Transmittal: REPORT
Geologic Hazards Evaluation
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

Dear Mr. Householder:

Western Geologic & Environmental has completed a Geologic Hazards Evaluation for the Proposed Osprey Ranch Development at 2050 Highway 150 in Eden, Utah and submits the attached report for your review.

If you have any questions regarding this report, please contact us at (801) 359-7222.

Sincerely,
Western Geologic & Environmental LLC

Bill. D. Black, P.G.
Subcontract Geologist

Reviewed By:

Kevin J. Thomas, P.G.
Principal Geologist

C:\Users\GLENDA\Documents\WG&E\PROJECTS GEO\Lewis Homes\Eden, UT - Geo Haz Eval - Proposed Osprey Ranch Dev - 2050 Highway 150 #5757\Geo Haz Eval - Proposed Osprey Ranch Development - 2050 Highway 150 - Eden, UT.docx

WG&E Project No. 5757

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

This report presents the results of a geology and geologic hazards review and evaluation conducted by Western Geologic & Environmental LLC (Western Geologic) for the Proposed Osprey Ranch Development located at 2050 Highway 150 in Eden, Utah (Figure 1 – Project Location). The Project consists of several contiguous parcels comprising a total of about 598 acres. The Project is located in western Ogden Valley west and northwest of the north arm of Pineview Reservoir in all or parts of Sections 3, 4, 32 and 33, Township 7 North, Range 1 East (Salt Lake Base Line and Meridian; Figure 1). Elevation of the Project ranges between about 4,951 feet to 5,892 feet above sea level. Based on a Gardner Engineering site plan (preliminary plan sheet SP1 dated June 22, 2021), the Project is currently proposed for development of a water tank and a 67-lot residential subdivision with lot sizes of from 3.03 to 32.57 acres. The site plan is currently preliminary and no site grading or home locations are shown. The Project is currently undeveloped.

Western Geologic previously completed a geologic hazards evaluation for a 277-acre portion of the Project in October 2006 in conjunction with a geotechnical evaluation by Earthtec Testing and Engineering (Western Geologic, 2006). This portion of the overall Project was termed Moose Mountain Estates in 2006. Our report found high-risk geologic hazards at the proposed Moose Mountain Estates development from earthquake ground shaking, stream flooding, landslides, and radon. Data from this study was limited due to its age, but was reviewed to help prepare site-specific geologic mapping for the Project. Western Geologic also completed geologic hazards evaluations for the Beckstead Property located at about 1860 North Big Sky Drive (Western Geologic, 2018a) and the WAJ Enterprises Property located at about 2050 North Big Sky Drive (Western Geologic, 2018b) in October 2018. These properties are adjacent to the western boundary of the Project slightly north of the proposed onsite water tank location. Western Geologic (2018a) included two walk-in test pit exposures that were used to help prepare cross section R-R' (Figure 5R, Section 5.4). Test pit data from Western Geologic (2018b) was reviewed to also help prepare site-specific geologic mapping for the Project.

2.0 PURPOSE AND SCOPE

The purpose and scope of this investigation is to identify and interpret surficial geologic conditions at the site to identify potential risk from geologic hazards to the Project. This investigation is intended to: (1) provide preliminary geologic information and assessment of geologic conditions at the site; (2) identify potential geologic hazards that may be present and qualitatively assess their risk to the intended site use; and (3) provide recommendations for additional site- and hazard-specific studies or mitigation measures, as may be needed based on our findings. Such recommendations could require further multi-disciplinary evaluations, and/or may need design criteria that are beyond our professional scope. Our investigation was conducted concurrently with a geotechnical engineering study performed at the Project by Christensen Geotechnical.

2.1 Methodology

The following services were performed in accordance with the above-stated purpose and scope:

- A site reconnaissance conducted by an experienced certified engineering geologist to assess the site setting and look for adverse geologic conditions;
- Review of readily-available geologic maps, reports, and air photos;
- Logging of 67 onsite walk-in test pits to assess subsurface conditions;
- Preparation of 18 geologic cross sections based on site-specific subsurface data and inferred conditions; and
- Evaluation of available data and preparation of this report, which presents the results of our study.

The engineering geology section of this report has been prepared in accordance with Bowman and Lund (2016) and current generally accepted professional engineering geologic principles and practice in Utah, and meets specifications provided in Chapter 27 of the Weber County Land Use Code within the above stated scope. We do not include discussion of radon hazard potential, as recommended in Bowman and Lund (2016), because radon gas poses an environmental health hazard and indoor levels are heavily influenced by several post-construction, non-geologic factors. The hazard from radon should be evaluated by long-term testing following construction.

2.2 Limitations and Exceptions

This investigation was performed at the request of Lewis Homes (the Client) using the methods and procedures consistent with good commercial and customary practice designed to conform to acceptable industry standards. The analysis and recommendations submitted in this report are based upon the data obtained from site-specific observations and compilation of known geologic information. This information and the conclusions of this report should not be interpolated to adjacent properties without additional site-specific information. In the event that any changes are later made in the location of the proposed site, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or approved in writing by the engineering geologist.

This report has been prepared by the staff of Western Geologic for the Client under the professional supervision of the principal and/or senior staff whose seal(s) and signatures appear hereon. Neither Western Geologic, nor any staff member assigned to this investigation has any interest or contemplated interest, financial or otherwise, in the subject or surrounding properties, or in any entity which owns, leases, or occupies the subject or surrounding properties or which may be responsible for environmental issues identified during the course of this investigation, and has no personal bias with respect to the parties involved.

The information contained in this report has received appropriate technical review and approval. The conclusions represent professional judgment and are founded upon the findings of the investigations identified in the report and the interpretation of such data based on our experience and expertise according to the existing standard of care. No other warranty or limitation exists, either expressed or implied.

The investigation was prepared in accordance with the approved scope of work outlined in our proposal for the use and benefit of the Client; its successors, and assignees. It is based, in part, upon documents, writings, and information owned, possessed, or secured by the Client. Neither this report, nor any information contained herein shall be used or relied upon for any purpose by any other person or entity without the express written permission of the Client. This report is not for the use or benefit of, nor may it be relied upon by any other person or entity, for any purpose without the advance written consent of Western Geologic.

In expressing the opinions stated in this report, Western Geologic has exercised the degree of skill and care ordinarily exercised by a reasonable prudent environmental professional in the same community and in the same time frame given the same or similar facts and circumstances. Documentation and data provided by the Client, designated representatives of the Client or other interested third parties, or from the public domain, and referred to in the preparation of this assessment, have been used and referenced with the understanding that Western Geologic assumes no responsibility or liability for their accuracy. The independent conclusions represent our professional judgment based on information and data available to us during the course of this assignment. Factual information regarding operations, conditions, and test data provided by the Client or their representative has been assumed to be correct and complete. The conclusions presented are based on the data provided, observations, and conditions that existed at the time of the field exploration.

3.0 HYDROLOGY

The U.S. Geological Survey (USGS) topographic map of the Huntsville Quadrangle shows the site is in western Ogden Valley between Nordic Valley and the north arm of Pineview Reservoir (Figure 1). Two perennial streams (Coal Hollow and Grover Hollow creeks, Figure 1) cross the Project, and several intermittent and ephemeral drainages also head within the Project, as identified on sheet DR1 in the June 22, 2021, Gardner Engineering preliminary plan set. There are also several small seasonal ponds at the Project and at least three reported spring areas. No springs are mapped on Figure 1 at the site. Both perennial streams were flowing at the time of our field investigation, although the ponds and intermittent drainages all appeared dry.

Ogden Valley is dominated in the valley bottom by unconsolidated lacustrine and alluvial basin-fill deposits. Slopes in the site area are mainly in weathered Tertiary-age tuffaceous bedrock overlain by a veneer of unconsolidated Quaternary alluvial and colluvial deposits. Avery (1994) indicates groundwater in Ogden Valley occurs under perched, confined, and unconfined conditions in the valley fill to depths of 750 feet or more. A well-stratified lacustrine silt layer forms a leaky confining bed in the upper part of the valley-fill aquifer. The aquifer below the

confining beds is the principal aquifer, which is in primarily fluvial and alluvial-fan deposits. The principal aquifer is recharged from precipitation, seepage from surface water, and subsurface inflow from bedrock into valley fill along the valley margins (Avery, 1994). The confined aquifer is typically overlain by a shallow, unconfined aquifer recharged from surface flow and upward leakage. Groundwater flow is generally from the valley margins into the valley fill, and then toward the head of Ogden Canyon (Avery, 1994).

No site-specific groundwater information was available for the Project, but the Utah Department of Water Rights Well Driller's database shows five water wells near the eastern Project boundary (Figure 1). The drillers' logs for these wells report depths to static groundwater of from 25 to 50 feet, with a mean depth of 36.6 feet and a median depth of 30 feet. We anticipate groundwater conditions at the Project to be similar, though depths may vary locally with topography. Groundwater depths at the site also likely vary seasonally from snowmelt runoff and annually from climatic fluctuations, which would be typical for an alpine environment; and perched conditions above less-permeable, clay-rich bedrock layers are likely present in the subsurface that cause locally shallower groundwater levels. No groundwater was encountered in the test pits at the site, except for TP-11, although several test pits exposed evidence for past possible perched shallow groundwater (as discussed in Section 5.1). Given the above, our geologic cross sections (Section 5.4) assume groundwater is typically at a depth of around 30 feet, with a secondary perched groundwater zone in the upper 5 feet of weathered bedrock. We expect groundwater flow at the site to generally be to the northeast and east depending on topography.

4.0 GEOLOGY

4.1 Surficial Geology

The site is located on the western margin of Ogden Valley, a sediment-filled intermontane valley within the Wasatch Range, a major north-south trending mountain range marking the eastern boundary of the Basin and Range physiographic province (Stokes; 1977, 1986). Surficial geology of the site is mapped by Coogan and King (2016; Figure 2A) and McDonald (2020; Figure 2B). Coogan and King (2016) is a regional geologic map, whereas McDonald (2020) is a surficial geologic map for the Huntsville quadrangle. Both geologic maps indicate much of the Project is underlain by either landslide deposits of varying ages or Tertiary Norwood Formation bedrock. The Ogden Valley southwestern margin fault (aka West Ogden Valley fault) is also shown on both maps crossing the southwestern and western parts of the site, but is concealed beneath late Pleistocene- to Holocene-age unconsolidated sediments.

Coogan and King (2016) describe surficial geologic units in the site area on Figure 2A (from youngest to oldest) as follows:

> ***Qh, Qh?*** – *Human disturbances (Historical).* Mapped disturbances obscure original deposits or rocks by cover or removal; only larger disturbances that pre-date the 1984 aerial photographs used to map the Ogden 30 x 60- minute quadrangle are shown; includes engineered fill, particularly along Interstate Highways 80 and 84, the Union Pacific Railroad, and larger dams, as well as aggregate operations, gravel pits, sewage-treatment facilities, cement plant quarries and operations, brick plant and clay pit,

Defense Depot Ogden (Browning U.S. Army Reserve Center), gas and oil field operations (for example drill pads) including gas plants, and low dams along several creeks, including a breached dam on Yellow Creek.

Qal, Qal1, Qal2, Qal2? – *Stream alluvium and flood-plain deposits (Holocene and uppermost Pleistocene).* Sand, silt, clay, and gravel in channels, flood plains, and terraces typically less than 16 feet (5 m) above river and stream level; moderately sorted; unconsolidated; along the same drainage Qal2 is lower than Qat2 and has likely been subject to flooding, at least prior to dam building; present in broad plains along the Bear, Ogden, and Weber Rivers and larger tributaries like Deep, Cottonwood, East Canyon, Lost, and Saleratus Creeks, along Box Elder, Heiners, and Yellow Creeks, and in narrower plains of larger tributary streams; locally includes muddy, organic overbank and oxbow lake deposits; composition depends on source area, so in back valleys typically contains many quartzite cobbles recycled from the Wasatch Formation; mostly Holocene, but deposited after regression of Lake Bonneville from the late Pleistocene Provo shoreline; width in Morgan Valley is combined flood plain of Weber River and East Canyon and Deep Creeks; 6 to 20 feet (2-6 m) thick and possibly as much as 50 feet (15 m) along Weber River and thinner in the Kaysville quadrangle; greater thicknesses (>50 feet [15 m]) are reported in Morgan Valley (Utah Division of Water Rights, well drilling database), but likely include Lake Bonneville and older Pleistocene deposits.

Suffixes 1 and 2 indicate ages where they can be separated, with 1 including active channels and 2 including low terraces 10 to 20 feet (3-6 m) above the Weber and Ogden Rivers, and the South Fork Ogden River that may have been in the flood plain prior to damming of these waterways. Qal2 queried in low terraces above Bear River, Saleratus Creek, and Dry Creek where deposits may not be in the flood plain.

Qaf, Qafy, Qaf3, Qaf3?, Qaf4, Qaf4?, Qaf5 – *Alluvial-fan deposits (Holocene and Pleistocene).* Mostly sand, silt, and gravel that is poorly bedded and poorly sorted and that is not close to late Pleistocene Lake Bonneville and is geographically in the Huff Creek and upper Bear River drainages; variably consolidated; includes debris flows, particularly in drainages and at drainage mouths (fan heads); generally less than 60 feet (18 m) thick. Qaf with no suffix used where age uncertain or for composite fans where portions of fans with multiple ages cannot be shown separately at map scale; toes of some fans have been removed by human disturbances, so their age cannot be determined.

Where possible, subdivided into relative ages, indicated by letter and number suffixes (like Qa and Qat suffixes) and relative ages only apply to the local drainage, with unit Qafy being the lowest (youngest) fans and unit 3 may or may not post-date Lake Bonneville. Relative ages of these fans are partly based on heights above present drainages at drainage-eroded edge of fan. The relative age is queried where the age is uncertain, generally due to the height not fitting into the typical order of surfaces. The various deposits listed, Qafy and Qaf3 through Qaf5, are 20 to 140 feet (6-40 m) above and west of Saleratus Creek, and also above Yellow Creek and the Bear River. Qafy fans are active, impinge on present-day floodplains, divert active streams, and overlie low terraces.

Qac – *Alluvium and colluvium (Holocene and Pleistocene).* Unsorted to variably sorted gravel, sand, silt, and clay in variable proportions; includes stream and fan alluvium, colluvium, and, locally, mass-movement deposits too small to show at map scale; typically mapped along smaller drainages that lack flat bottoms; more extensive east of Henefer where Wasatch Formation (Tw) strata easily weather to debris that "chokes" drainages; 6 to 20 feet (2-6 m) thick. Some deposits are "perched" on benches 80 feet (25 m) and more above present-day drainages like Left Fork Heiners Creek (Heiners Creek quadrangle) and Harris Canyon (Henefer quadrangle). In the Devils Slide quadrangle, some deposits are "perched" on benches about 60 to 130 feet (18-40 m) above Quarry Cottonwood Canyon indicating the alluvium is at least partly Lake Bonneville age and older (see Qab and Qao in tables 1 and 2).

Qay, Qa2, Qa2?, Qa3, Qa3?, Qa4, Qa4?, Qa4-5, Qa5, Qa6 – *Alluvium (Holocene and Pleistocene).* Sand, silt, clay, and gravel in stream and alluvial-fan deposits that are not close to late Pleistocene Lake Bonneville and are geographically in the Huff Creek and upper Bear River drainages; variably sorted; variably consolidated; composition depends on source area; deposits lack fan shape of Qaf and are distinguished from terraces (Qat) based on upper surface sloping toward adjacent streams from sides of drainage, or are shown where fans and terraces are too small to show separately at map scale; Qay is at to slightly above present drainages and not incised by active drainages, so is the youngest unit; generally 6 to 20 feet (2-6 m) thick.

Age-number and letter suffixes on alluvium (undivided, channel, flood plain, terrace, and fan) that is not close to late Pleistocene Lake Bonneville are relative and only apply to the local drainage, with suffix 2 being the second youngest; the relative age is queried where age uncertain, generally due to the height not fitting into the typical order of surfaces. The various numbered deposits listed, Qa2 through Qa6, are 20 to 180 feet (6-55 m) above the Bear River, Saleratus Creek, and Yellow Creek. Qa5 and Qa3? are only used in stacked units (Qa5/Tfb and Qa3?/Tfb).

Qafp, Qafp?, Qafb, Qafb?, Qafpb, Qafpb? – *Lake Bonneville-age alluvial-fan deposits (upper Pleistocene).* Like undivided alluvial fans, but height above present drainages appears to be related to shorelines of Lake Bonneville and is within certain limits (see table 1); these fans are inactive, unconsolidated to weakly consolidated, and locally dissected; fans labeled Qafp and Qafb are related to the Provo (and slightly lower) and Bonneville shorelines of late Pleistocene Lake Bonneville, respectively, while unit Qafpb is used where fans may be related to the Provo or Bonneville shoreline (for example Qafpb is ~40 feet [12 m] above Lost Creek Valley), or where fans of different ages cannot be shown separately at map scale; Qafp fans typically contain well-rounded, recycled Lake Bonneville gravel and sand and are moderately well sorted; generally 10 to less than 60 feet (3-18 m) thick. Lake Bonneville-age fans are queried where relative age is uncertain (see Qaf for details); fans labeled Qafpb? are above the Bonneville shoreline and might be Qafo or like Qafm; see the note under Qao about two possible ages of older alluvium (Qao, Qato, and Qafo).

Most of the Lake Bonneville-age fans in the James Peak quadrangle are far from the Bonneville shoreline and their age is inferred from their stratigraphic relationship(s) to coeval Pinedale glacial outwash (see age equality in Table 3).

The channels (Qafp/Qdlb) on the Weber River delta and Lake Bonneville fines (Qafp on Qlfb) probably record scour and fill during the rapid drawdown of the lake as it fell from the Bonneville shoreline to the Provo shoreline.

Qmc – *Landslide and colluvial deposits, undivided (Holocene and Pleistocene).* Poorly sorted to unsorted clay- to boulder-sized material; mapped where landslide deposits are difficult to distinguish from colluvium (slope wash and soil creep) and where mapping separate, small, intermingled areas of landslide and colluvial deposits is not possible at map scale; locally includes talus and debris flow and flood deposits; typically mapped where landslides are thin ("shallow"); also mapped where the blocky or rumpled morphology that is characteristic of landslides has been diminished ("smoothed") by slope wash and soil creep; composition depends on local sources; 6 to 40 feet (2-12 m) thick. These deposits are as unstable as other landslide units (Qms, Qmsy, Qmso).

Qms, Qms?, Qmsy, Qmsy?, Qmso, Qmso? – *Landslide deposits (Holocene and upper and middle? Pleistocene).* Poorly sorted clay- to boulder sized material; includes slides, slumps, and locally flows and floods; generally characterized by hummocky topography, main and internal scarps, and chaotic bedding in displaced blocks; composition depends on local sources; morphology becomes more subdued with time and amount of water in material during emplacement; Qms may be in contact with Qms when landslides are different/distinct; thickness highly variable, up to about 20 to 30 feet (6-9 m) for small slides, and 80 to 100 feet (25-30 m) thick for larger landslides. Qmsy and Qmso queried where relative age uncertain; Qms queried where classification uncertain. Numerous landslides are too small to show at map scale and more detailed maps shown in the index to geologic mapping should be examined.

Qms without a suffix is mapped where the age is uncertain (though likely Holocene and/or late Pleistocene), where portions of slide complexes have different ages but cannot be shown separately at map scale, or where boundaries between slides of different ages are not distinct. Estimated time of emplacement is indicated by relative-age letter suffixes with: Qmsy mapped where landslides deflect streams or failures are in Lake Bonneville deposits, and scarps are variably vegetated; Qmso typically mapped where deposits are "perched" above present drainages, rumpled morphology typical of mass movements has been diminished, and/or younger surficial deposits cover or cut Qmso. Lower perched Qmso deposits are at Qao heights above drainages (95 ka and older) and the higher perched deposits may correlate with high level alluvium (QTa) (likely older than 780 ka) (see table 1). Suffixes y and o indicate probable Holocene and Pleistocene ages, respectively, with all Qmso likely emplaced before Lake Bonneville transgression. These older deposits are as unstable as other slides, and are easily reactivated with the addition of water, be it irrigation or septic tank drain fields.

Qmdf, Qmdf? – *Debris- and mud-flow deposits (Holocene and upper and middle? Pleistocene).* Very poorly sorted, clay- to boulder-sized material in unstratified deposits characterized by rubbly surface and debris-flow levees with channels, lobes, and mounding; variably vegetated; in drainages typically form mounds, an indication of more viscous Qmdf, rather than being flat like unit Qac; Qmdf queried where may not

be mostly debris- and mud-flow deposits; many debris flows cannot be shown separately from alluvial fans at map scale; 0 to 40 feet (0-12 m) thick. Age(s) uncertain; deposits in drainages likely post-date the Provo shoreline of Lake Bonneville, while deposits above drainages, like north of the Right Hand Fork Peterson Creek, are likely as old as Bull Lake glaciation, but could pre-date Bull Lake glaciation and be middle Pleistocene.

Qls, Qls?, Qlsp, Qlsb, Qlsb? – *Lake Bonneville sand (upper Pleistocene).* Mostly sand with some silt and gravel deposited nearshore below and near the Provo shoreline (Qlsp) and between the Provo and Bonneville shorelines (Qlsb); Qls mapped downslope from slope break below Provo shoreline beach deposits where thin Lake Bonneville regressional sand may overlie transgressional sand; grades downslope into unit Qlf with decreasing sand content and laterally with more gravel into units Qdlp, Qdlb, and upslope with more gravel into unit Qlgb; Qls and Qlsb queried where grain size or unit identification uncertain; may be as much as 75 feet (25 m) thick, and thickest near Ogden; typically less than 20 feet (6 m) thick in Morgan Valley; may include small deltas and deltas that lack typical delta shape.

Qla, Qla? – *Lake Bonneville lacustrine deposits and post- and pre-Lake Bonneville alluvial deposits, undivided (Holocene and upper? Pleistocene).* Mostly poorly sorted and poorly bedded sand, silt, and clay, with some gravel; mapped where Lake Bonneville deposits are reworked by later stream action or covered by thin stream and fan deposits, and where lake deposits are thin and overlie older alluvial deposits; unit queried where may be dominantly alluvium; deposits typically eroded from shallow Norwood Formation; mostly mapped near Bonneville shoreline; also mapped in Peterson quadrangle along upper Deep Creek above Bonneville shoreline where lake deposits seem to indicate landslide dam of creek; thickness uncertain.

Qdlb, Qdlb? – *Transgressive and Bonneville-shoreline deltaic and lacustrine deposits (upper Pleistocene).* Mostly sand, silty sand, and gravelly sand deposited near shore in Lake Bonneville; extensive at mouth of Weber Canyon; related to transgression to and occupation of the Bonneville shoreline with lacustrine deposits covering deltaic deposits; in Morgan Valley and near mouth of Coldwater Canyon (North Ogden quadrangle) contain more cobbles and overall more gravel; 0 to at least 40 feet (12 m) thick in Ogden and Morgan Valleys; about 400 feet (120 m) thick in bluff at the mouth of Weber Canyon. These deposits are prone to slope failures.

Qadb, Qadb? – *Transgressive and Bonneville-shoreline alluvial and deltaic deposits (upper Pleistocene).* Cobbly gravel, sand, silt, and clay deposited above (subaerial) and in Lake Bonneville (subaqueous); typically mapped where shorelines are obscure, so that line cannot be drawn between alluvial fan and delta; include rounded to subangular clasts in a matrix of sand and silt with interbeds of sand and silt; mapped above the Provo shoreline and deposited as lake transgressed to and was at the Bonneville shoreline; typically better sorted delta and lake deposits over poorly sorted alluvial-fan deposits; Qadb prominent along Deep Creek (Morgan quadrangle) and Strawberry Creek (Snow Basin quadrangle); 0 to at least 40 feet (0-12+ m) thick.

Note that the Bonneville-shoreline fan-delta unit (Qadb), at 80 to 100 feet (24-30 m) above present drainages, is typically higher than the related alluvial units (Qab, Qafb) (see table 1). A fan-delta is built when an alluvial fan enters a lake or ocean, and includes both the fan and the delta.

Qafp, Qafp?, Qafb, Qafb?, Qafpb, Qafpb? – *Lake Bonneville-age alluvial-fan deposits (upper Pleistocene).* Like undivided alluvial fans, but height above present drainages appears to be related to shorelines of Lake Bonneville and is within certain limits (see table 1); these fans are inactive, unconsolidated to weakly consolidated, and locally dissected; fans labeled Qafp and Qafb are related to the Provo (and slightly lower) and Bonneville shorelines of late Pleistocene Lake Bonneville, respectively, while unit Qafpb is used where fans may be related to the Provo or Bonneville shoreline (for example Qafpb is ~40 feet [12 m] above Lost Creek Valley), or where fans of different ages cannot be shown separately at map scale; Qafp fans typically contain well-rounded, recycled Lake Bonneville gravel and sand and are moderately well sorted; generally 10 to less than 60 feet (3-18 m) thick. Lake Bonneville-age fans are queried where relative age is uncertain (see Qaf for details); fans labeled Qafpb? are above the Bonneville shoreline and might be Qafo or like Qafm; see the note under Qao about two possible ages of older alluvium (Qao, Qato, and Qafo).

Most of the Lake Bonneville-age fans in the James Peak quadrangle are far from the Bonneville shoreline and their age is inferred from their stratigraphic relationship(s) to coeval Pinedale glacial outwash (see age equality in Table 3).

The channels (Qafp/Qdlb) on the Weber River delta and Lake Bonneville fines (Qafp on Qlfb) probably record scour and fill during the rapid drawdown of the lake as it fell from the Bonneville shoreline to the Provo shoreline.

Qao, Qao? – *Older alluvium (mostly upper Pleistocene).* Sand, silt, clay, and gravel above and likely older than the Bonneville shoreline; mapped on surfaces above Lake Bonneville-age alluvium (Qap, Qab, Qapb); deposits lack fan shape (Qaf) and are distinguished from terraces (Qat) based on upper surface sloping toward adjacent streams from sides of drainage; also shown where areas of fans and terraces are too small to show separately at map scale; composition depends on source area; at least locally up to 110 feet (34 m) thick. Queried where classification or relative age is uncertain (see Qa for details); for example near head of Saleratus Creek.

Qafo, Qafo? – *Older alluvial-fan deposits (mostly upper Pleistocene).* Incised and at least locally dissected fans of mostly sand, silt, and gravel that is poorly bedded and poorly sorted; includes debris flows, particularly in drainages and at drainage mouths (fan heads); older fans are typically above the Bonneville shoreline, with an eroded bench at the shoreline; upstream and above the Bonneville shoreline, unit Qafo is topographically higher than fans graded to the Bonneville shoreline (Qafb), and is typically dissected; generally less than 60 feet (18 m) thick. In Mantua Valley, exposed thickness up to about 100 feet (30 m), but water wells (sections 26 and 27, T. 9 N., R. 1 W.) were still in gravelly to bouldery valley fill at depths of 505 and 467 feet (154 and 142 m), respectively, and red coloration that may indicate Wasatch Formation bedrock was not noted (see Bjorklund and McGreevy, 1973, p. 16).

Qafo queried where relative age is uncertain (see Qaf for details), for example in Mantua quadrangle where it is as high as Qafoe in Morgan Valley (see table 1). Qafo queried in East Canyon graben because the deposits are not dissected and some deposits mantle Qafoe (see also unit Qafm above), resulting in a reversal of relative height and only local incision. These irregular deposits are likely the result of salt movement in the East Canyon graben. Our Qafo is roughly shown to south by Bryant (1990) as Qgp (pediment gravel); farther south he showed Qoa (dissected alluvium) adjacent to the East Canyon fault, which may be the QTaf or Qafoe we mapped.

Amino-acid age estimates presented in Sullivan and Nelson (1992) imply Qafo north of Morgan considerably predates Lake Bonneville and is middle Pleistocene in age (>400 ka). However, the Bonneville shoreline is obscure on this fan, and soil-carbonate age estimates (>70-100 ka) and other amino-acid age estimates (~98-155 ka) in Sullivan and others (1988) imply these older fans are related to Bull Lake glaciation (95,000 to 130,000 years old; see Chadwick and others, 1997; Phillips and others, 1997). As noted under Qao, Qafo deposits may contain two ages (levels) of alluvial surfaces that are not easily recognized in Morgan Valley but are recognized upstream in the Henefer and Lost Creek Valleys (Devils Slide quadrangle) and along the North and South Forks of Ogden River.

Tn, Tn? – *Norwood Formation (lower Oligocene and upper Eocene).* Typically light-gray to light-brown altered tuff (claystone), altered tuffaceous siltstone and sandstone, and conglomerate; unaltered tuff, present in type section south of Morgan, is rare; locally colored light shades of red and green; variable calcareous cement and zeolitization; involved in numerous landslides of various sizes; estimate 2000-foot (600 m) thick in exposures on west side of Ogden Valley (based on bedding dip, outcrop width, and topography). Norwood Formation queried where poor exposures may actually be surficial deposits. For detailed Norwood Formation information see description under heading "Sub-Willard Thrust - Ogden Canyon Area" since most of this unit is in and near Morgan Valley and covers the Willard thrust, Ogden Canyon, and Durst Mountain areas.

Zpu, Zpu? – *Formation of Perry Canyon, Upper member (Neoproterozoic).* Olive drab to gray, thin-bedded slate to argillite to phyllite to micaceous meta-siltstone to meta-graywacke to meta-sandstone in variable proportions such that unit looks like both the "greywacke-sandstone" and "mudstone" members of previous workers; unit identification based on underlying diamictite in Mantua quadrangle; rare meta-gritstone and meta-diamictite (actually conglomerate?); locally schistose; meta-sandstone contains poorly sorted lithic, quartz, and feldspar grains in silty to micaceous matrix; meta-sandstone is quartzose in outcrops on west margin of Mantua quadrangle (Crittenden and Sorensen, 1985a) and medial zone of sandstone is feldspathic east of Ogden Valley, where mapped and described as argillite member of Maple Canyon Formation by Crittenden (1972) and Sorensen and Crittenden (1979); thickness uncertain, but appears to be about 600 feet (180 m) thick on west flank of Grizzly Peak in the Mantua quadrangle and about 1000 feet (300 m) thick between Ogden Canyon and North Ogden divide. In Ogden Valley typically non-resistant and tan weathering such that gray to green to dark-gray fresh color is seldom seen except in cut slopes and excavations. This unit is prone to slope failures.

Zmcg, Zmcg? – *Maple Canyon Formation, Lower (green arkose) member (Neoproterozoic).* Grayish-green, fine-grained arkosic (feldspathic) meta-sandstone and sandy argillite (meta-graywacke), with local quartzite lenses up to 200 feet (60 m) thick; weathers darker gray to brown to greenish-gray and greenish-brown; 500 to 1000 feet (150-305 m) thick and lower thickness would eliminate the need for faulting in southwest part of Huntsville quadrangle. This unit is prone to slope failures.

McDonald (2020) describes surficial geologic units in the site area on Figure 2B (from youngest to oldest) as follows:

Qmsh – *Landslide deposits, historical (Holocene).* Poorly sorted clay- to boulder-sized material in slides, slumps, flows, and landslide complexes; generally characterized by hummocky topography, head, lateral, and/or internal scarps, and chaotic bedding in displaced blocks; composition depends on local sources; morphology becomes more subdued with increasing age and/or rate of movement; includes landslides having historical movement that has been observed, documented, or is apparent on aerial imagery; thickness highly variable.

Qaly – *Stream alluvium and floodplain deposits (Holocene to upper Pleistocene).* Poorly to moderately sorted, pebble to cobble gravel with a matrix of sand, silt, and clay in channels and floodplains and low terraces typically less than 10 feet (3 m) above modern channel level; angular to subangular grains; composition depends on source area; moderately sorted within beds; locally includes muddy overbank and organic-rich marsh deposits; present along the major valley-bottom streams including the North, Middle, and South Forks of the Ogden River, and Wolf Creek; 0 to 20 feet (0–6 m) thick.

Qat1 – *Stream terrace deposits (middle Holocene? to upper Pleistocene?).* Poorly to well sorted pebble to cobble gravel in a matrix of sand, silt and clay in terraces above modern
streams and/or floodplains; subangular to subrounded grains; poorly to moderately bedded; typically about 5 to 10 feet (1–3 m) above modern channels; 0 to 10 feet (0–3 m) thick.

Qafy – *Younger alluvial-fan deposits (Holocene to upper Pleistocene).* Poorly to moderately sorted pebble to cobble gravel with silt, sand and minor clay matrix; angular to subangular grains; poorly to moderately bedded; composition depends on source area; includes debris flows, debris floods, and channel deposits on large alluvial fans notably at the mouth of Geertzen Canyon where a large, nearly 1.5-mile-wide (2.5 km) by over 1-mile-long (1.5 km) fan exists; elsewhere, smaller alluvial fans grade into active stream channels or lacustrine surfaces; the Geertzen Canyon fan contains abundant cobbles and boulders derived from Paleozoic quartzites and Paleogene conglomeratic surface deposits above and flanking the northeast margin of Ogden Valley; 0 to 30 feet (0–6 m) thick.

Qmsy – *Landslide deposits, younger (Holocene to upper Pleistocene?)* – Poorly sorted clay- to boulder-sized material in slides, slumps, flows, and landslide complexes; generally characterized by hummocky topography, head, lateral, and/or internal scarps, and chaotic bedding in displaced blocks; composition depends on local sources; morphology becomes more subdued with increasing age and/or rate of movement; morphology suggests likely post-Lake Bonneville movement with relatively sharp and pronounced landslide deformation features and may include parts that are historic and active; thickness highly variable.

Qla – *Lacustrine and alluvial deposits, undivided (Holocene to upper Pleistocene).* Poorly to moderately sorted silt, sand, clay, and gravel; subangular to rounded clasts; moderately to well-bedded; includes Lake Bonneville-age transgressional deposits below and near the highstand shoreline and post-Bonneville stream alluvium overlain by, interbedded with, and/or reworked by streams; includes alluvial deposits aggraded to the Provo shoreline that are likely time equivalent to the overflowing and regressive phases of Lake Bonneville; 1 to 10 feet (0.3–3 m) thick.

Qac – *Alluvium and colluvium (Holocene to middle Pleistocene?).* Unsorted to variably sorted silt, sand, gravel, clay, cobble and boulder in variable proportions and roundness; includes stream and fan alluvium, colluvium, sheetwash deposits, and locally mass-movement deposits that are too small to map separately at map scale; typically mapped along drainages bounded by hillslopes where colluvium grades into alluvium without distinct break in slope and in smaller drainages lacking flat bottoms or too small to subdivide at map scale; 0 to 20 feet (0–6 m) thick.

Qms – *Landslide deposits, undifferentiated (Holocene to middle Pleistocene?).* Poorly sorted clay- to boulder-sized material in slides, slumps, flows, and landslide complexes; generally characterized by hummocky topography, head, lateral, and/or internal scarps, and chaotic bedding in displaced blocks; composition depends on local sources; morphology becomes more subdued with increasing age and/or rate of movement; mapped where relative age cannot be distinguished or where landslide complexes have portions with different ages and/or rates of activity; thickness highly variable.

Qmc – *Mass-movement and colluvial deposits, undivided (Holocene to middle Pleistocene?).* Poorly sorted to unsorted, mostly clay, silt, sand, gravel, cobble, and boulder; angular to rounded clasts; nonbedded; mapped on slopes where individual landslides, slumps, slope wash, and soil creep are difficult to distinguish from one another; often characterized by hummocky slopes composed of numerous slumps of various sizes and ages includes soil creep, sappy areas, talus, slope wash, and debris-flow deposits but lack clear landslide scarps and lateral margins to allow separate mapping; typically forms on slopes overlying clay-bearing, landslide prone bedrock units—notably Neogene volcaniclastics and argillic Proterozoic formations; 0 to 40 feet (0–12 m) thick.

Qafb – *Younger alluvial-fan deposits (upper Pleistocene).* Poorly sorted pebble to cobble gravel with silt, sand and minor clay matrix; angular to subangular grains; poorly to moderately bedded; composition depends on source area; includes debris

flows, debris floods, and channel deposits that grade into Lake Bonneville transgressive or highstand shoreline deposits or at a height above modern fan surfaces consistent with correlative deposits; 0 to 30 feet (0–6 m) thick.

Qls – *Lake Bonneville sand and gravel deposits (upper Pleistocene).* Moderately to poorly sorted, moderately to well-bedded sand and gravel with silt and clay; subangular to rounded clasts; deposited in transgressive Lake Bonneville nearshore environments; includes thin clay and silt interbeds deposited off shore; may grade laterally into Qlf or Qdl; typically less than 20 feet (6 m) thick.

Qlf – *Lake Bonneville fine-grained deposits (upper Pleistocene).* Moderately to well-sorted and moderately bedded to thinly laminated clay, silt, and sand deposited during the transgression and highstand of Lake Bonneville; rounded to well-rounded clasts; deposited in shallow to moderately deep water; typically overlies pre-Bonneville alluvium and may overlie middle Pleistocene Little Valley lake cycle (Scott and others, 1983; Oviatt and others, 1999) fine-grained deposits in the central part of the valley; 5 feet (2 m) thick or greater.

Qao – *Older alluvium (upper to middle Pleistocene?).* Poorly to moderately sorted sand, silt, clay, and gravel on surfaces; subangular to subrounded grains; poorly to moderately bedded; deposits are typically isolated remnants in the valley or along valley margin drainages; located above and presumed older than Lake Bonneville-age alluvium and likely same age as Qafo but lacking alluvial-fan morphology; 10 to 50 feet (3–15 m) thick.

Qafo – *Older alluvial-fan deposits (upper to middle Pleistocene?).* Poorly to moderately sorted pebble to cobble gravel with a matrix of silt, sand and clay; subangular to subrounded clasts; poorly bedded; fans are typically eroded and incised locally with isolated fan remnants, deposits may be somewhat lithified, and characterized by a reddish, clay-rich matrix; deposits are likely early to middle Pleistocene-age and may include deposits previously mapped as Huntsville Fanglomerate (Eardley, 1955; Lofgren; 1955; Coody, 1957) and may include deposits where fan age is uncertain, or for composite fans, where parts of fans with different ages cannot be shown separately at map scale; 10 to 50 feet (3–15 m) thick.

Qmso – *Landslide deposits, older (upper to middle Pleistocene?)* – Poorly sorted clay- to boulder-sized material in slides, slumps, flows, and landslide complexes; generally characterized by hummocky topography, head, lateral, and/or internal scarps, and chaotic bedding in displaced blocks; composition depends on local sources; morphology becomes more subdued with increasing age and/or rate of movement; mapped where deposits generally have a more subdued morphology and are likely early Holocene and Pleistocene in age; include very large complexes underlain by argillite-rich bedrock where entire hillsides appear to be part of a landslide complex but where defining their boundaries are often difficult; thickness highly variable.

BR – *Rock (Tertiary to Precambrian)*. Mapping of bedrock structure and stratigraphy is beyond the scope of this project. Sorenson and Crittenden (1979) provide the most recent published 1:24,000-scale geologic map of the Huntsville quadrangle. Coogan and King (2016) performed a cursory revision of the bedrock of Sorenson and Crittenden (1979) in compiling the Ogden 30′ x 60′ quadrangle. For more information, refer to these maps and other maps and studies cited in the Previous Work section of this report.

Citations, tables, and figures above are not provided herein, but are in Coogan and King (2016) or McDonald (2020).

4.2 Seismotectonic Setting

The property is located at the western margin of Ogden Valley, a roughly 40-square mile back valley described by Gilbert (1928) as a structural trough similar to Cache and Morgan Valleys to the north and south, respectively. The back valleys of the northern Wasatch Range are in a transition zone between the Basin and Range and Middle Rocky Mountains physiographic provinces (Stokes, 1977, 1986). The Basin and Range is characterized by a series of generally north-trending elongate mountain ranges, separated by predominately alluvial and lacustrine sediment-filled valleys and typically bounded on one or both sides by major normal faults (Stewart, 1978). The boundary between the Basin and Range and Middle Rocky Mountains provinces is marked by the Wasatch fault zone (WFZ) at the base of the Wasatch Range. Late Cenozoic normal faulting, a characteristic of the Basin and Range, began between about 17 and 10 million years ago in the Nevada (Stewart, 1980) and Utah (Anderson, 1989) portions of the province. The faulting is a result of a roughly east-west directed, regional extensional stress regime that has continued to the present (Zoback and Zoback, 1989; Zoback, 1989). The back valleys are morphologically similar to valleys in the Basin and Range, but exhibit less structural relief (Sullivan and others 1986).

Ogden Valley occupies a structural trough created by up to 2,000 feet of vertical displacement on normal faults bounding the east and west sides of the valley. The Ogden Valley southwestern margin fault (aka West Ogden Valley fault) is mapped trending across the site slightly west of the proposed home. Coogan and King (2016) map the fault as concealed (Figure 2, dotted line) beneath Pleistocene- to Holocene-age alluvium in the area. Sullivan and others (1986) indicate the most recent movement on this fault is pre-Holocene. The nearest active (Holocene-age) fault to the site is the Weber section of the WFZ about 3.9 miles to the west.

The site is also in the central portion of the Intermountain Seismic Belt (ISB), a generally north-south trending zone of historical seismicity along the eastern margin of the Basin and Range province extending from northern Arizona to northwestern Montana (Sbar and others, 1972; Smith and Sbar, 1974). At least 16 earthquakes of magnitude 6.0 or greater have occurred within the ISB since 1850; the largest of these earthquakes was a M 7.5 event in 1959 near Hebgen Lake, Montana. None of these earthquakes occurred along the

WFZ or other known late Quaternary faults (Arabasz and others, 1992; Smith and Arabasz, 1991). The closest event was the 1934 Hansel Valley (M 6.6) event north of the Great Salt Lake. The March 18, 2020 M 5.7 Magna earthquake[1] reportedly showed a style, location, and slip depth consistent with an earthquake on the WFZ system. Despite being less than magnitude 6.0, this earthquake damaged multiple buildings and was felt from southern Idaho to south-central Utah[2]. The University of Utah Seismograph Stations indicates the Magna earthquake[3] was weakly felt in Ogden Valley, with a peak acceleration of about 0.005 g and an instrument intensity of II-III (on a Roman numeral scale of I-X).

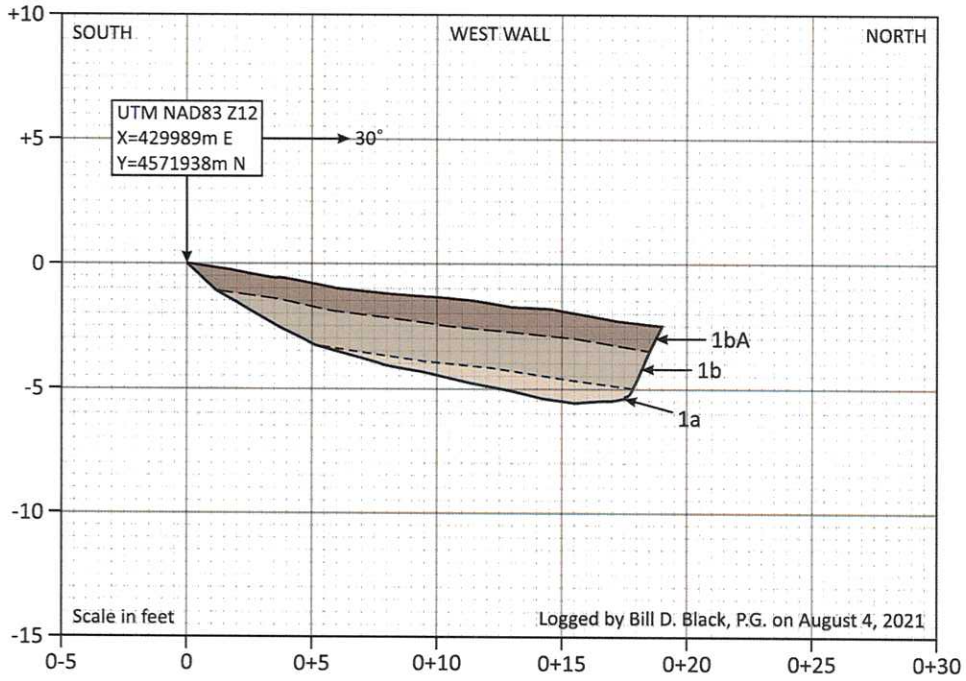
4.3 Lake Bonneville History

Lakes occupied nearly 100 basins in the western United States during late-Quaternary time, the largest of which was Lake Bonneville in northwestern Utah. The Bonneville basin consists of several topographically closed basins created by regional extension in the Basin and Range (Gwynn, 1980; Miller, 1990), and has been an area of internal drainage for much of the past 15 million years. Lake Bonneville consisted of numerous topographically closed basins, including the Salt Lake and Cache Valleys (Oviatt and others, 1992). Sediments from Lake Bonneville are mapped in the northeast and southeast parts of the Project.

Timing of events related to the transgression and regression of Lake Bonneville are indicated in Oviatt (2015). Approximately 30,000 years ago, Lake Bonneville began a slow transgression (rise) to its highest level of 5,160 to 5,200 feet above mean sea level. The lake rise eventually slowed as water levels approached an external basin threshold in northern Cache Valley at Red Rock Pass near Zenda, Idaho. Lake Bonneville reached the Red Rock Pass threshold and occupied its highest shoreline, termed the Bonneville beach, around 18,000 years ago. Headward erosion of the Snake River-Bonneville basin drainage divide, possibly combined with landsliding in the threshold area, then caused a catastrophic incision that caused the lake level to lower by about 425 feet in less than a year (Jarrett and Malde, 1987; O'Conner, 1993). Following the Bonneville flood, the lake stabilized and formed a lower shoreline referred to as the Provo shoreline up to about 16,000 years ago. Climatic factors then caused the lake to regress rapidly from the Provo shoreline, and by about 13,000 years ago the lake had eventually dropped below historic levels of Great Salt Lake. Oviatt and others (1992) deem this low stage the end of the Bonneville lake cycle. Great Salt Lake then experienced a brief transgression between 12,800 and 11,600 years ago to the Gilbert level at about 4,250 feet before receding to and remaining within about 20 feet of its historic average level (Lund, 1990; Oviatt, 2015). The highest Bonneville shoreline is mapped discontinuously in the eastern part of the Project on Figures 2A and 2B at an elevation of about 5,200 feet. Various sub-Bonneville transgressive shorelines are also mapped at lower elevations on Figures 2A and 2B.

[1] https://earthquake.usgs.gov/earthquakes/eventpage/uu60363602/executive
[2] https://www.ksl.com/article/46731630/
[3] https://earthquakes.utah.gov/magna-quake/#

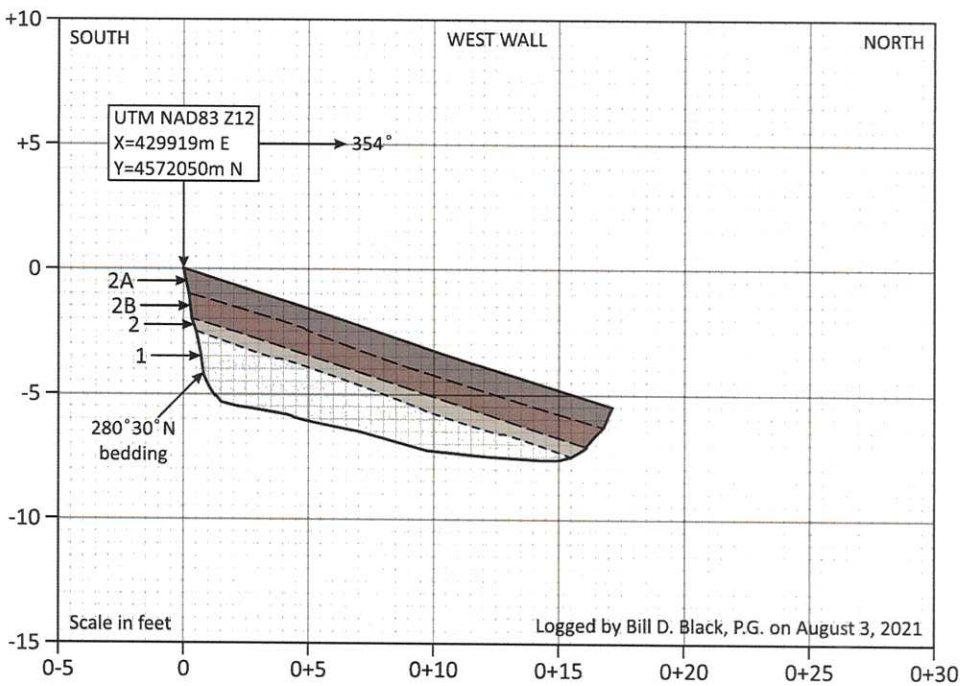
TEST PIT 37



UNIT DESCRIPTIONS

Unit 1. *Holocene mixed alluvium and colluvium* - sequence comprised of a lower (1a) matrix-supported, olive to orange-olive, dense, massive, clayey gravel (GC) with sand; and an upper (1b) clast-supported, dense, brown to dark brown, massive, gravel with clay (GW), sand, and subangular to subround cobbles and boulders with no carbonate; A soil horizon formed in upper unit (1bA); thickness > 3.5 feet.

TEST PIT 38



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light grayish-olive, strong to very strong, well bedded, weathered tuffaceous sandstone.

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown, stiff, massive, lean clay (CL) with sand and trace gravel; A and B soil horizons formed in unit (2A and 2B); about 2.5 feet thick.

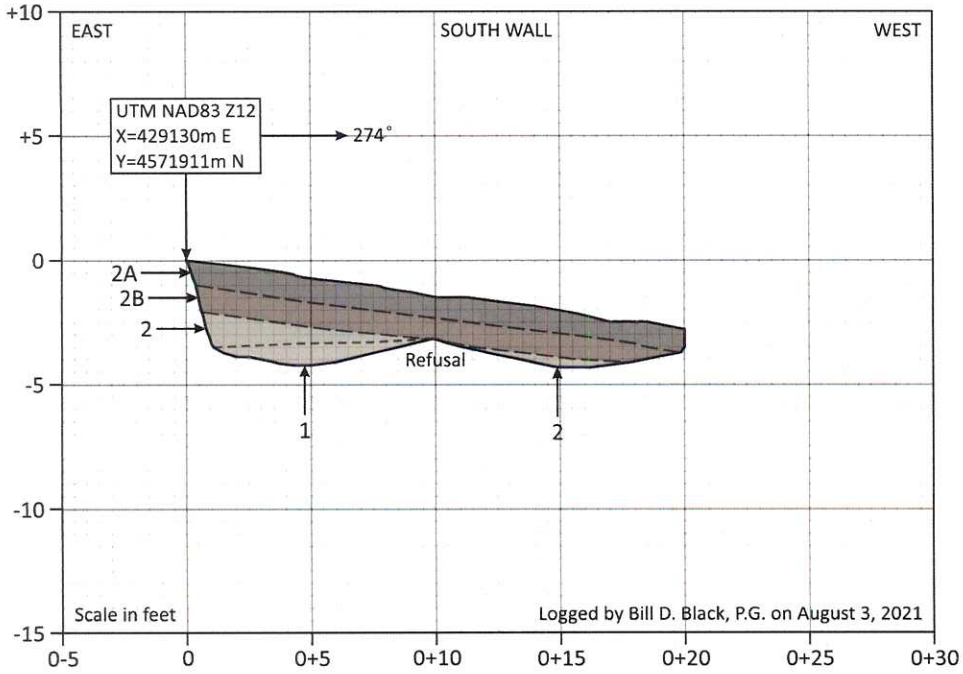
WESTERN GEOLOGIC

TEST PIT LOGS, 37 AND 38

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3S

TEST PIT 39

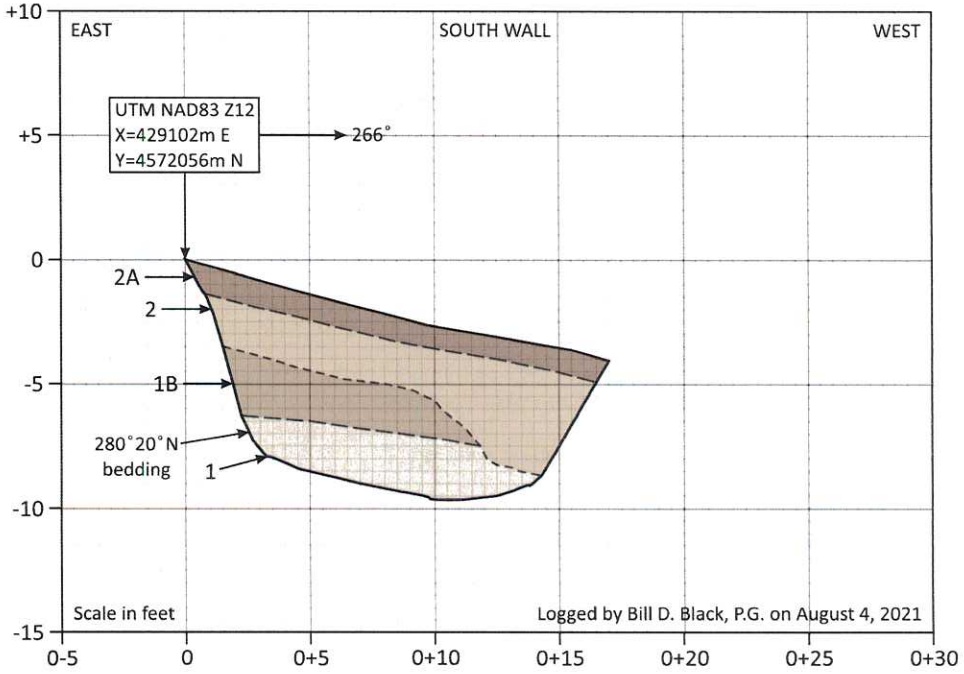


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation*- light gray to light brown, very strong, poorly bedded, weathered tuffaceous sandstone.

Unit 2. *Late Pleistocene tmass wasting colluvium* - reddish-brown to dark brown, massive, dense to medium dense, clayey gravel (GC) with sand and trace subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 1.5 to 3 feet thick.

TEST PIT 40



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown to grayish-brown, strong to medium strong, poorly bedded, weathered tuffaceous conglomerate with subangular to subround clasts with stage II carbonate; B soil horizon formed in unit (1B) but truncated by unit 2.

Unit 2. *Holocene mixed alluvium and colluvium?* - brown to dark grayish-brown, massive, medium dense, lean clay (CL) with sand and gravel; slightly vesicular; A soil horizon formed in unit (2A); about 3 to 5.5 feet thick.

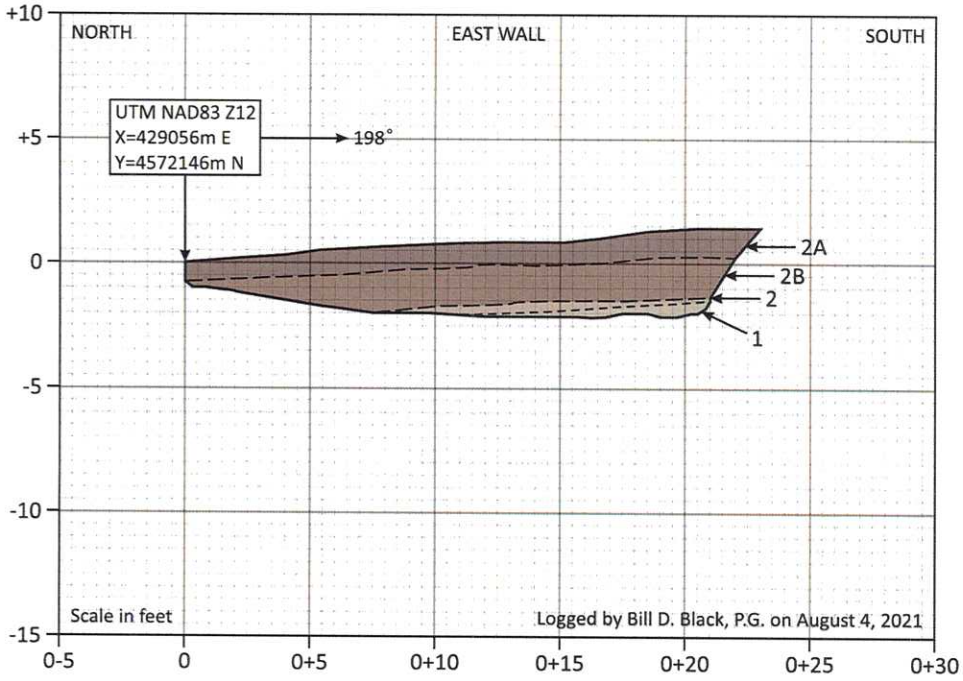
TEST PIT LOGS, 39 AND 40

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3T

WESTERN GEOLOGIC

TEST PIT 41

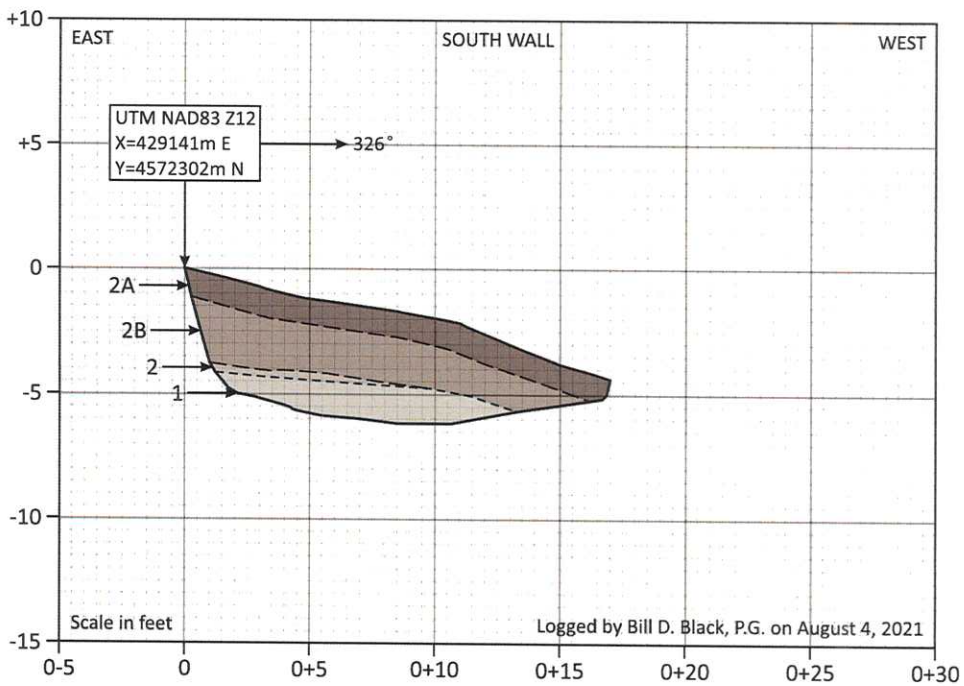


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange-brown, strong to very strong, massive to poorly bedded, weathered claystone; weak bedding dips to north.

Unit 2. *Late Pleistocene mass wasting colluvium* - grayish-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and gravel; slightly vesicular; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

TEST PIT 42



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, strong, massive, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, medium stiff, massive, sandy lean clay (CL) with gravel; contains blocks of unit 1 and discontinuous organic-enriched lamina and blocks; A and B soil horizons formed in unit (2A and 2B); 3 to 3.5 feet thick.

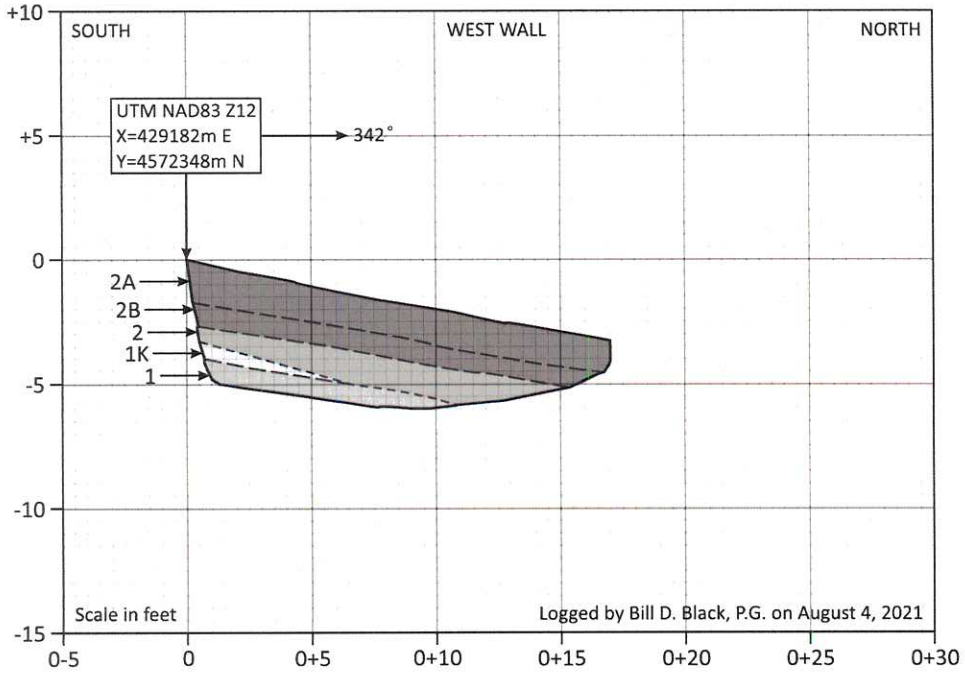
WESTERN GEOLOGIC

TEST PIT LOGS, 41 AND 42

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3U

TEST PIT 43

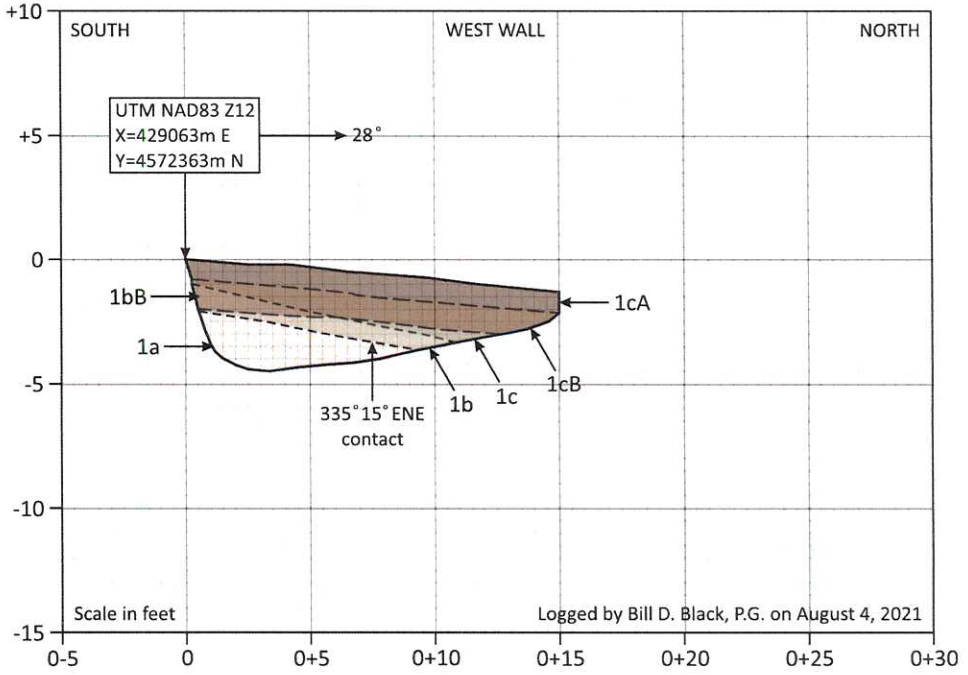


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange-brown, strong, poorly bedded, weathered tuffaceous conglomerate with topset carbonate and subangular to subround clasts; weak K soil horizon formed in unit (1K).

Unit 2. *Late Pleistocene tmass wasting colluvium* - dark grayish-brown, medium dense/stiff to dense/stiff; clayey sand to sandy clay (SC/CL) with gravel and subround cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 3.5 feet thick.

TEST PIT 44



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of weathered bedrock comprised of a lower (1a) light brown, strong, poorly bedded to massive, siltstone; a middle (1b) brownish-olive, strong, poorly bedded to massive, claystone; and an upper (1c) tuffaceous conglomerate; A and B soil horizons formed in unit (1bB, 1cB and 1cA).

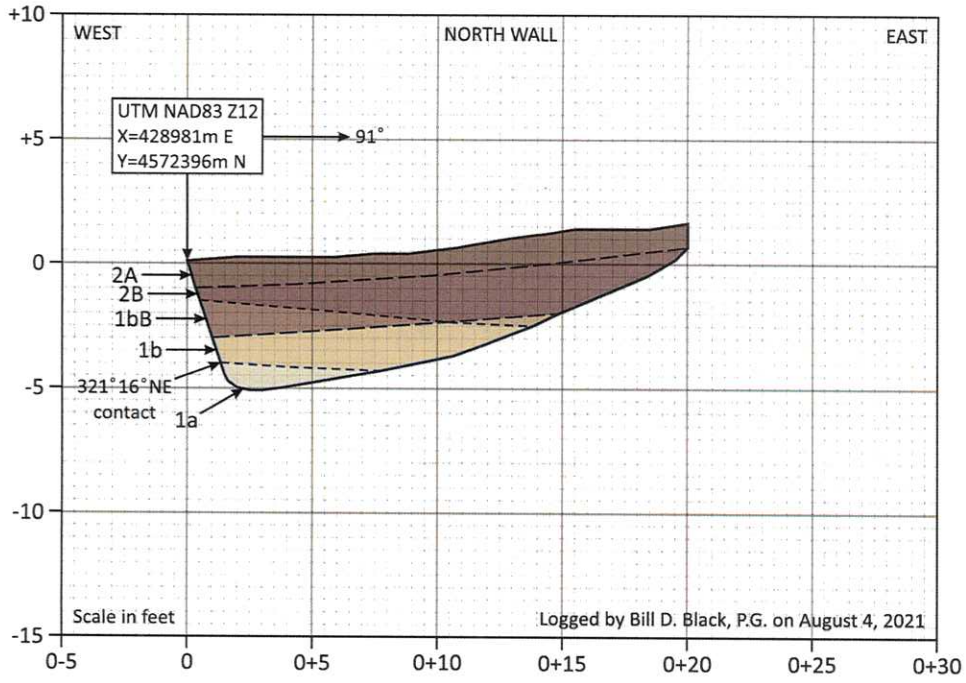
TEST PIT LOGS, 43 AND 44

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3V

WESTERN GEOLOGIC

TEST PIT 45

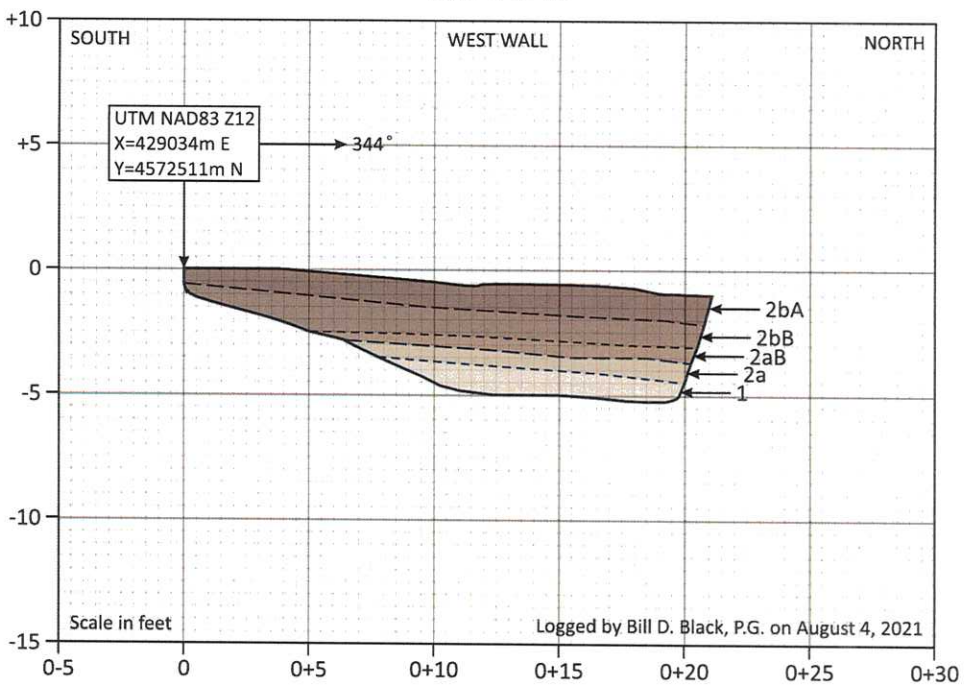


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of strong, weathered bedrock comprised of a lower (1a) olive-brown to light olive, thinly bedded siltstone to claystone; and an upper (1b) brownish-olive claystone; B soil horizon formed in upper unit (1bB).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown, stiff, massive, lean clay (CL) with sand, gravel and subangular to subround cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 1.5 to 3.5 feet thick.

TEST PIT 46



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - olive-brown, strong, massive, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - sequence of dense, massive colluvium comprised of a lower (2a) olive to brown, clayey gravel (GC) with sand and subangular cobbles with stage II carbonate; and an upper (2b) dark grayish-brown, clayey gravel (GC) with sand; A and B soil horizons formed in unit (2aB, 2bB and 2bA); overall about 3.5 feet thick.

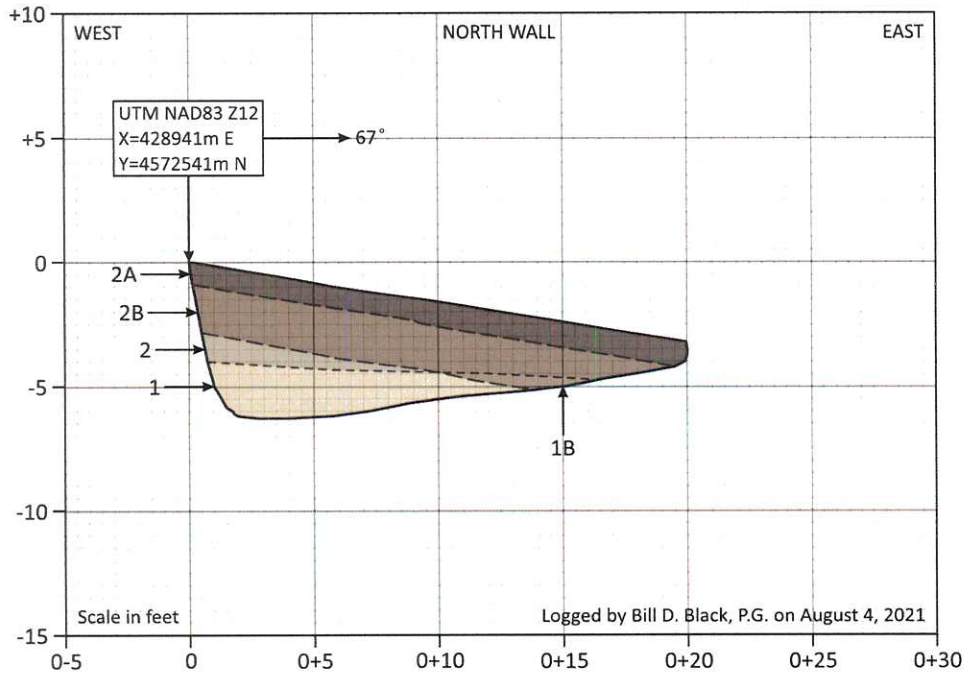
WESTERN GEOLOGIC

TEST PIT LOGS, 45 AND 46

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3W

TEST PIT 47

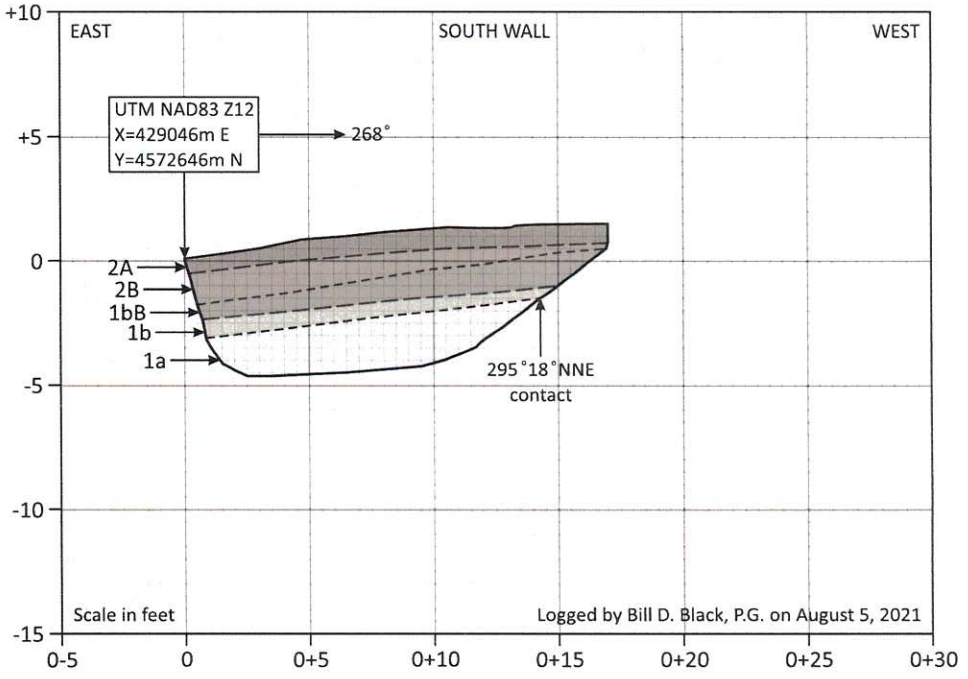


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - olive to light olive, strong, massive, weathered claystone with carbonate stringers in west test pit end; B soil horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown, stiff, massive, lean clay (CL) with sand and gravel; root penetrated; A and B soil horizons formed in unit (2A and 2B).; about 2 to 4 feet thick.

TEST PIT 48



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of brown, strong, poorly bedded to massive, weathered bedrock comprised of a lower (1a) claystone; and an upper (1b) matrix supported, tuffaceous conglomerate with subround to subangular clasts with stage II carbonate; B soil horizon formed in upper unit (1bB).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown to dark grayish-brown, medium dense to dense, massive, clayey gravel (GC) with sand and subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 1 to 2 feet thick.

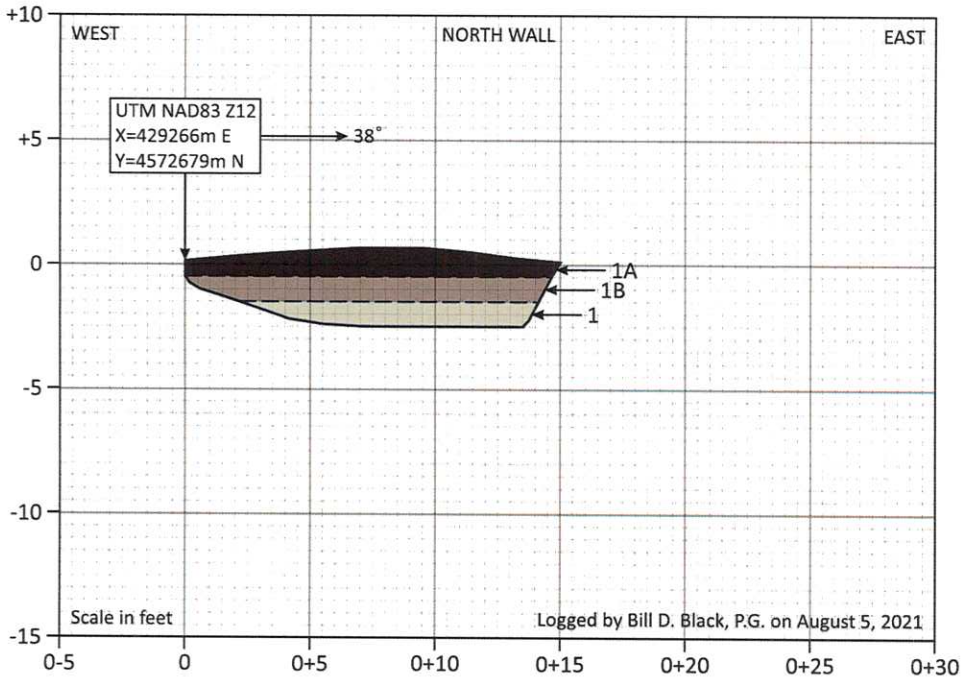
TEST PIT LOGS, 47 AND 48

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3X

WESTERN GEOLOGIC

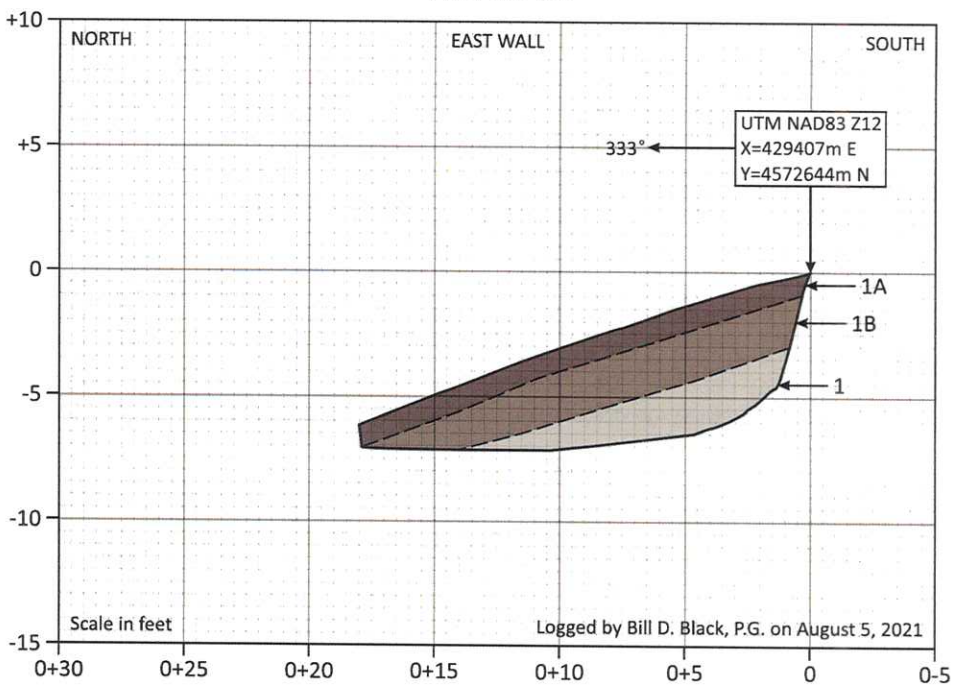
TEST PIT 49



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive brown, strong, poorly bedded to massive, weathered siltstone; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 50



UNIT DESCRIPTIONS

Unit 1. *Late Pleistocene to Holocene mixed alluvium and colluvium* - dark brown, stiff to very stiff, poorly bedded to massive, lean clay (CL) with sand, gravel and rare subround cobbles; contains discontinuous pebble gravel lenses; A and B soil horizons formed in unit (1A and 1B); thickness > 5 feet.

WESTERN GEOLOGIC

TEST PIT LOGS, 49 AND 50

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
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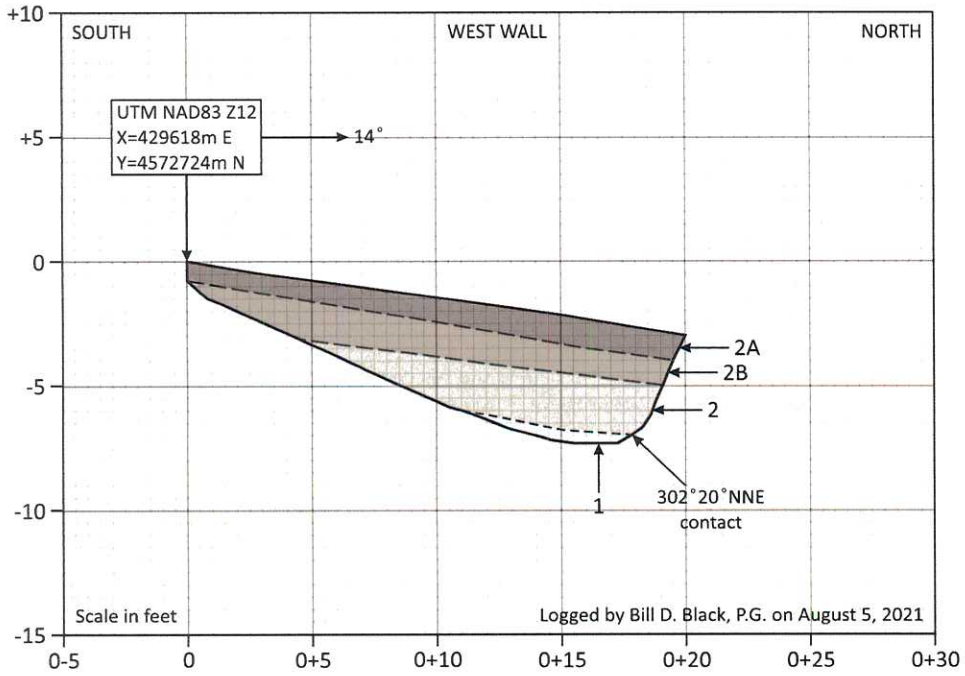
FIGURE 3Y

TEST PIT 51

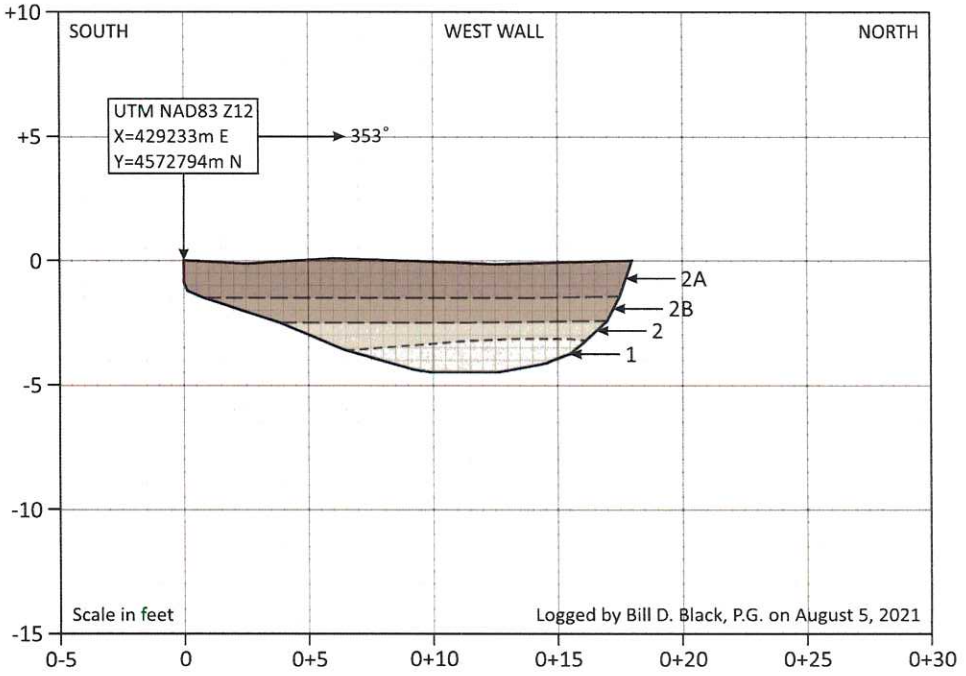


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brownish-olive, strong, poorly bedded, weathered siltstone.

Unit 2. *Late Pleistocene mass wasting colluvium* - yellowish-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and siltstone clasts; A and B soil horizons formed in unit (2A and 2B); about 4.5 feet thick.

TEST PIT 52



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brownish-olive, strong, poorly bedded to thinly laminated, weathered siltstone.

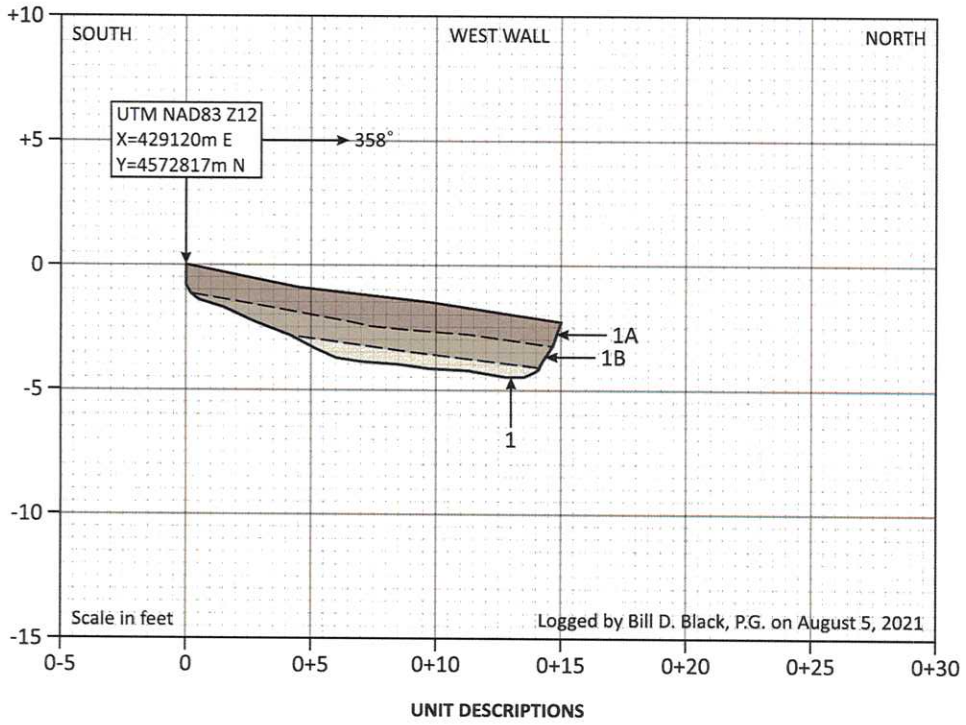
Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown to dark grayish-brown, stiff to medium stiff, massive, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 3 to 3.5 feet thick.

TEST PIT LOGS, 51 AND 52

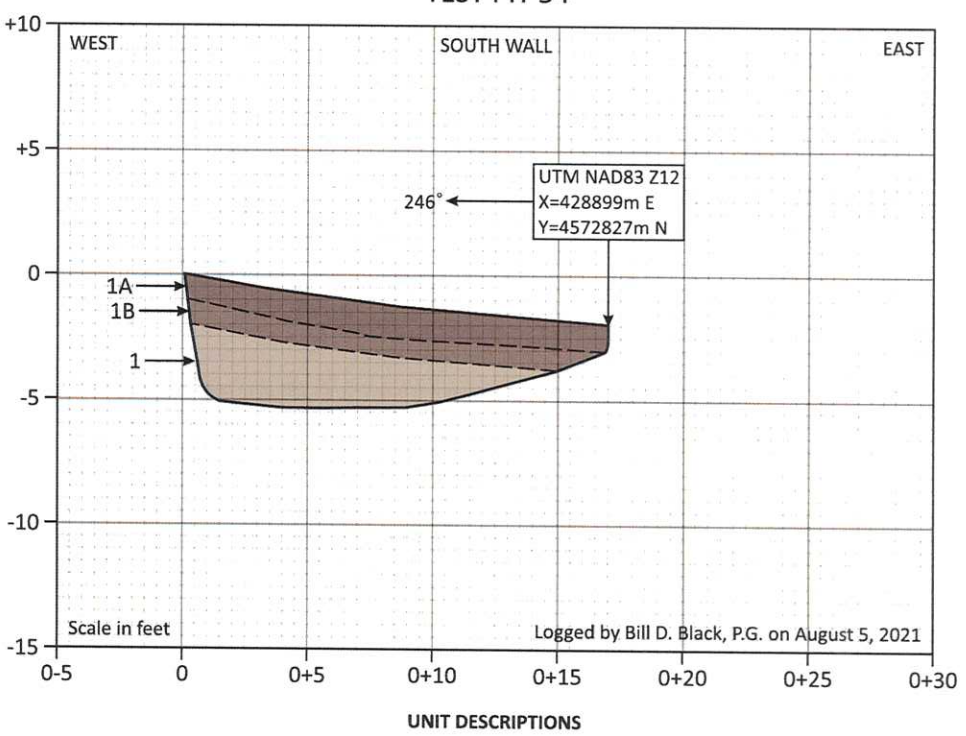
GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3Z

WESTERN GEOLOGIC



Unit 1. *Tertiary Norwood Formation* - light olive brown, strong, poorly bedded to massive, weathered siltstone; A and B soil horizons formed in unit (1A and 1B); refusal at test pit floor.



Unit 1. *Tertiary Norwood Formation* - dark olive to dark grayish-brown, strong, massive, weathered matrix-supported tuffaceous conglomerate; A and B soil horizons formed in unit (1A and 1B).

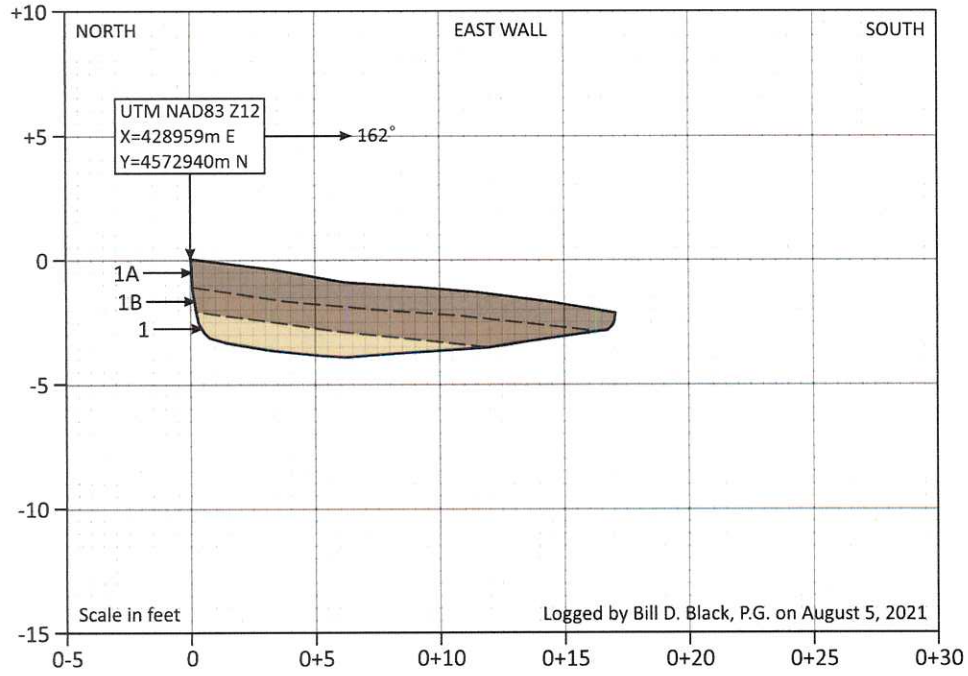
WESTERN GEOLOGIC

TEST PIT LOGS, 53 AND 54

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4A

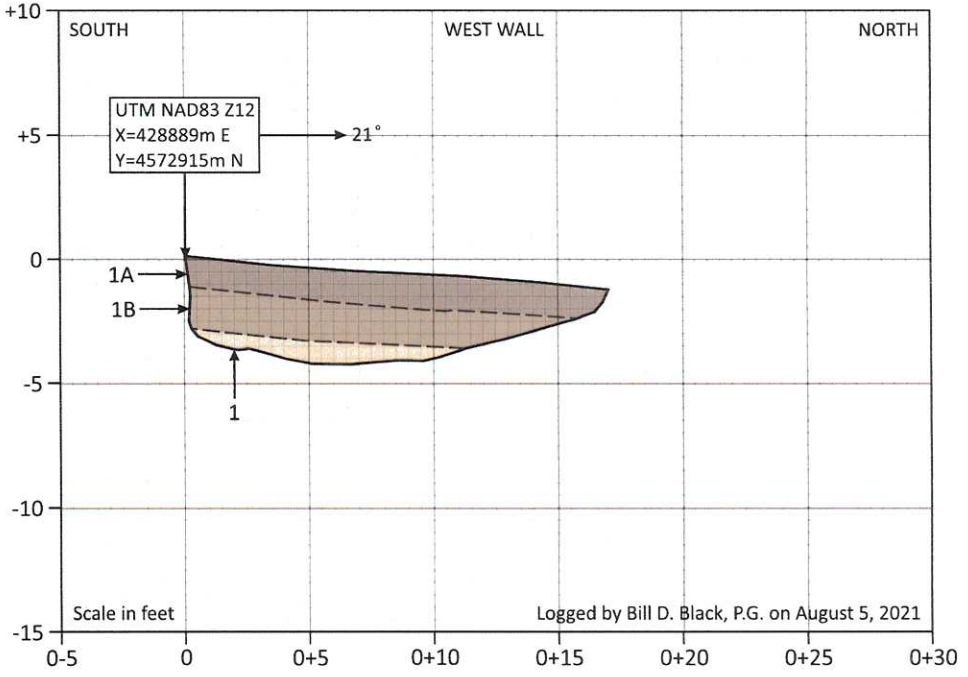
TEST PIT 55



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - reddish-brown to dark grayish-brown, strong, massive, weathered claystone grading to tuffaceous conglomerate in upper part; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 56



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown to dark grayish-brown, strong, massive, weathered claystone with gravel in upper part; A and B soil horizons formed in unit (1A and 1B).

TEST PIT LOGS, 55 AND 56

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
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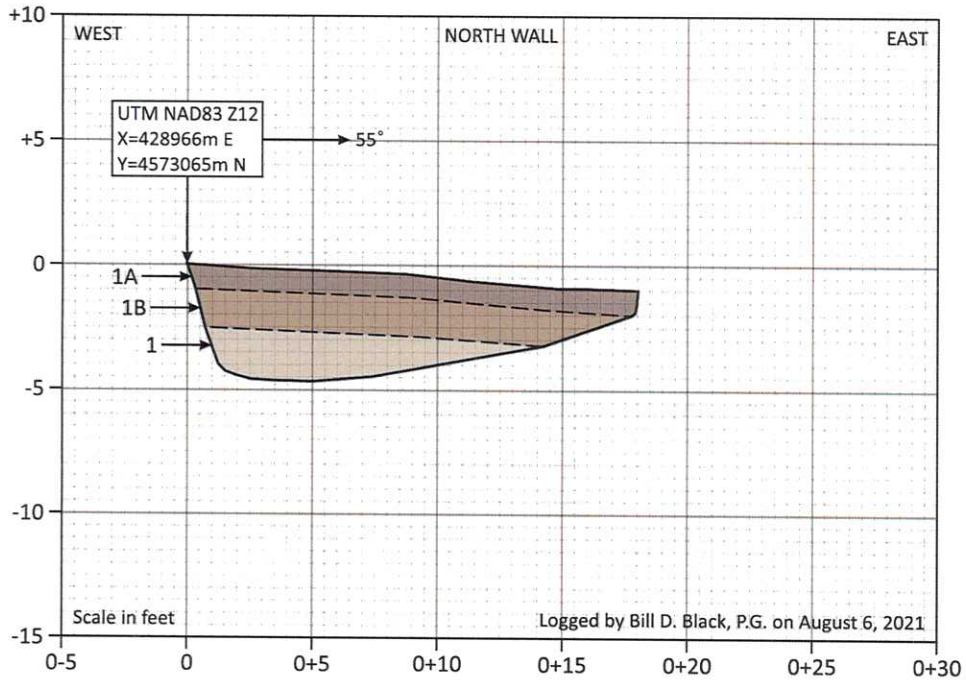
FIGURE 4B

WESTERN GEOLOGIC

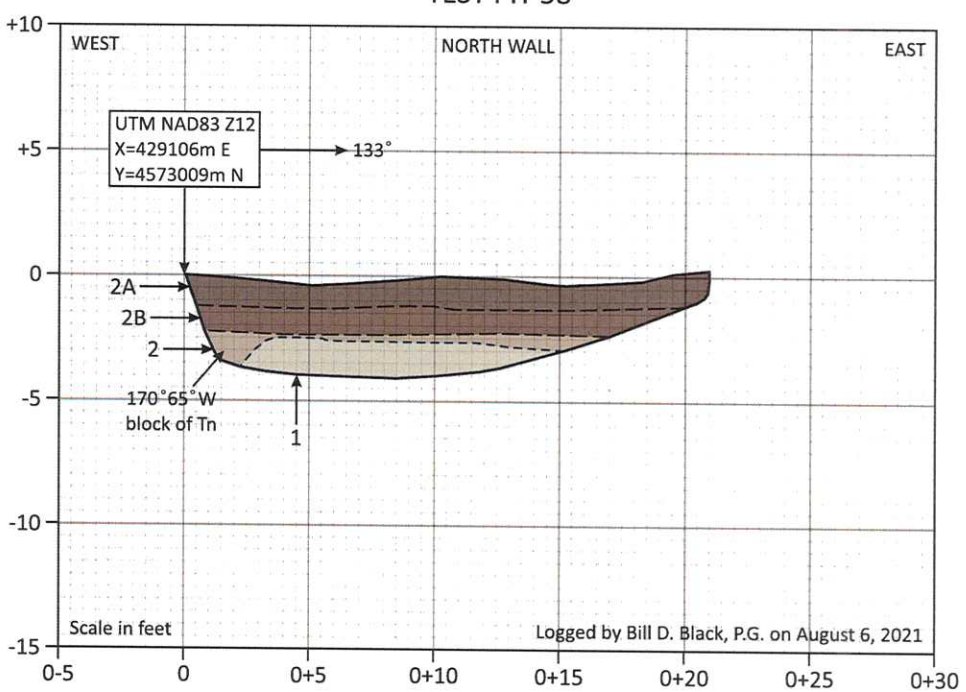
TEST PIT 57



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brown, orange-brown and dark brown; strong to very strong; massive, weathered claystone in lower part grading to tuffaceous conglomerate with subangular clasts with stage II carbonate in upper part; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 58



UNIT DESCRIPTIONS

Unit 1. *Middle to late Pleistocene mass wasting colluvium* - light brown to light olive-brown; dense to very dense, massive, clayey sand (SC) with gravel and fractured tuffaceous sandstone blocks; thickness > 1.5 feet.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 2.5 to 3.5 feet thick.

WESTERN GEOLOGIC

TEST PIT LOGS, 57 AND 58

GEOLOGIC HAZARDS EVALUATION
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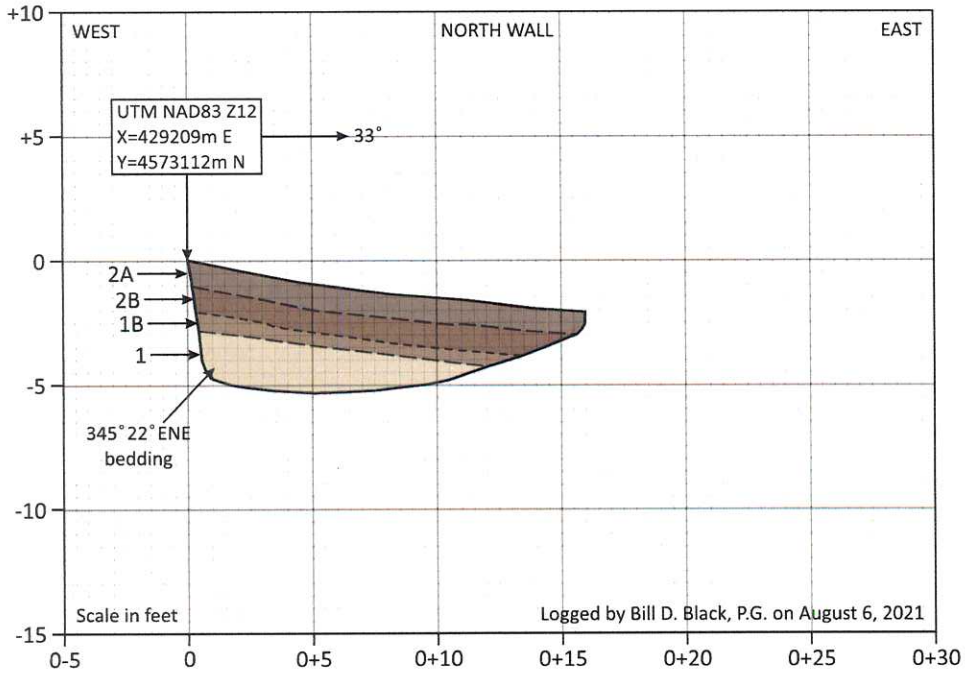
FIGURE 4C

TEST PIT 59

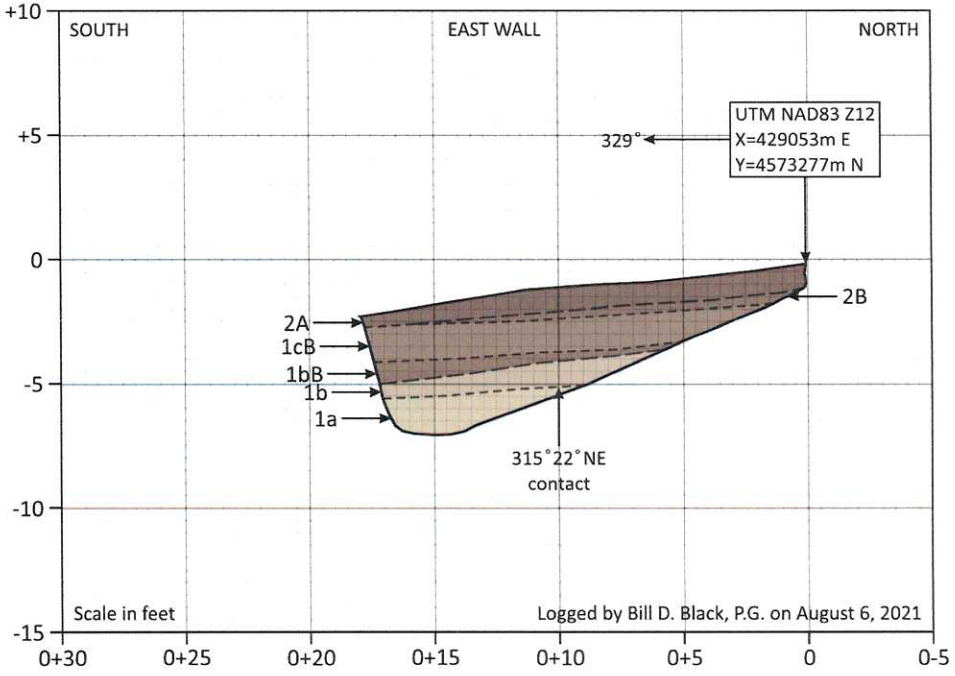


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brown, strong, poorly to well bedded, weathered tuffaceous sandstone with carbonate-enriched pebble interbeds; B soil horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown, stiff, massive, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 2.5 feet thick.

TEST PIT 60



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of weathered bedrock comprised of a lower (1a) light brown, strong, massive, tuffaceous sandstone; a middle (1b) dark brown, strong to medium strong, tuffaceous conglomerate; and an upper (1c) light brownish-olive, medium strong, massive, claystone; B soil horizon formed in middle and upper units (1bB and 1cB).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown, medium dense, massive, clayey gravel (GC) with sand and angular to subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 0.5 to 1.5 feet thick.

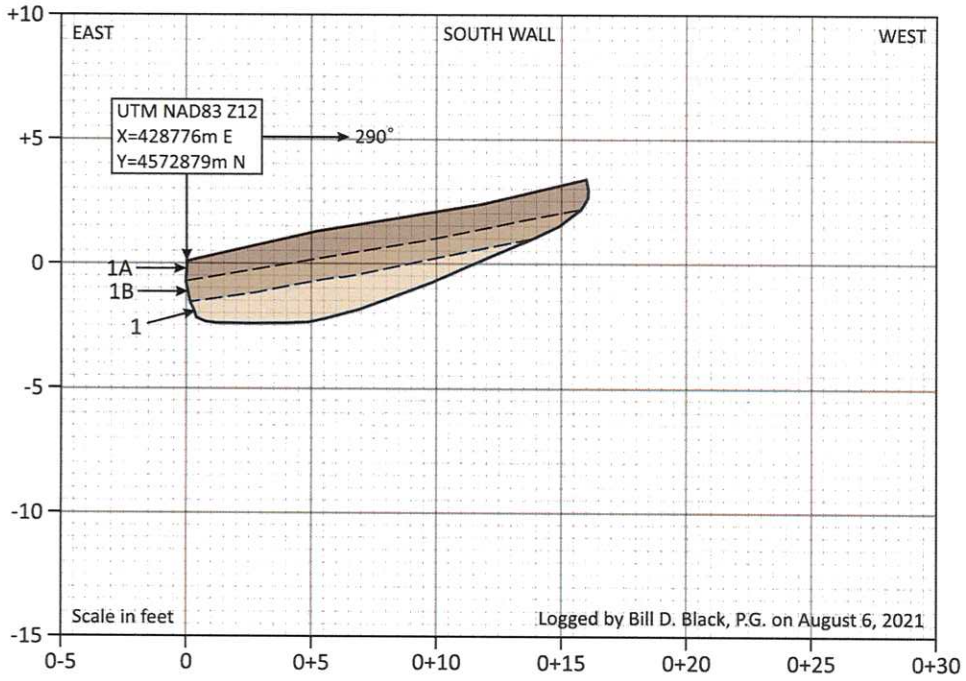
TEST PIT LOGS, 59 AND 60

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4D

WESTERN GEOLOGIC

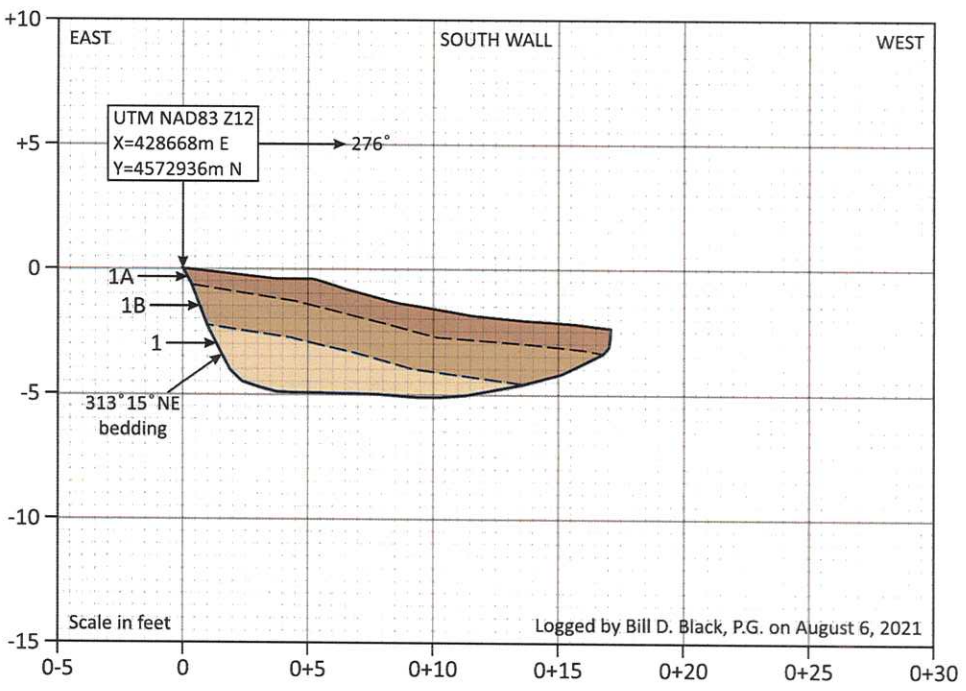
TEST PIT 61



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light orange-brown to dark brown, strong, poorly bedded to massive, weathered tuffaceous conglomerate; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 62



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange-brown to brown, poorly bedded, strong, claystone to pebble conglomerate; A and B soil horizons formed in unit (1A and 1B).

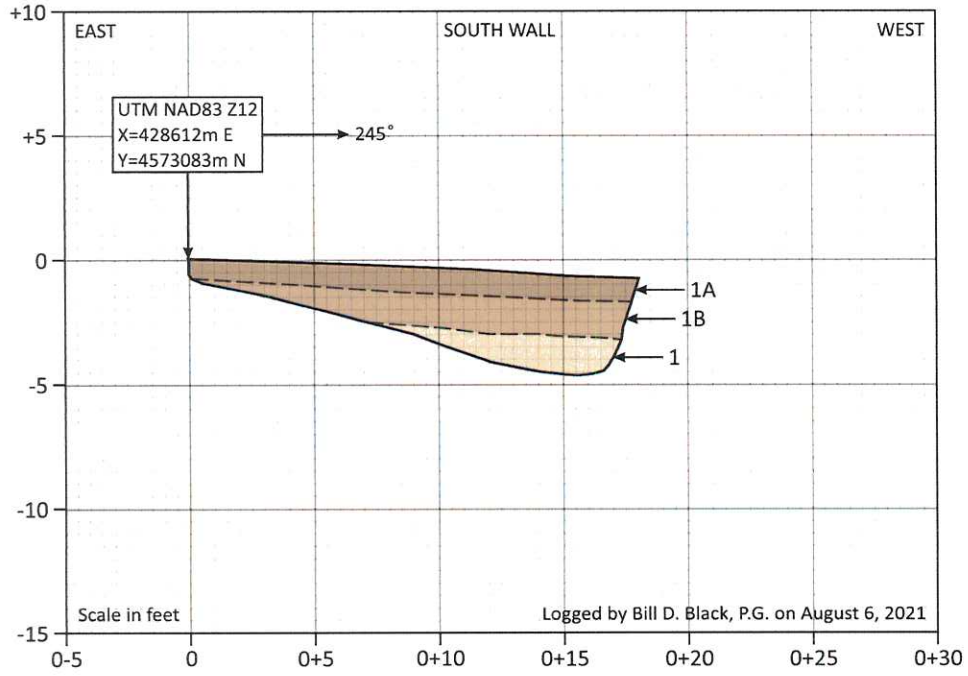
WESTERN GEOLOGIC

TEST PIT LOGS, 61 AND 62

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4E

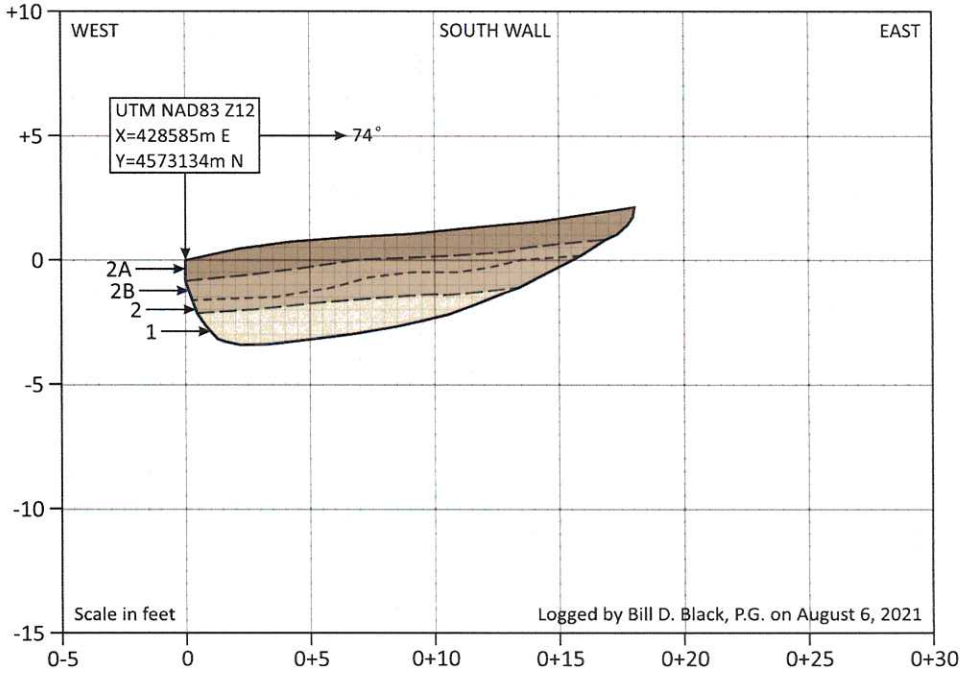
TEST PIT 63



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange-brown to dark brown, strong, massive, weathered tuffaceous conglomerate with subangular clasts with stage II carbonate; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 64



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - olive-brown to orange-brown, strong, massive, weathered claystone grading upward to matrix-supported tuffaceous conglomerate; B soil horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown, dense, massive, clayey gravel (GC) with sand, trace subround to subangular cobbles with stage II carbonate in basal part of unit; A and B soil horizons formed in unit (2A and 2B); 1.5 to 2 feet thick.

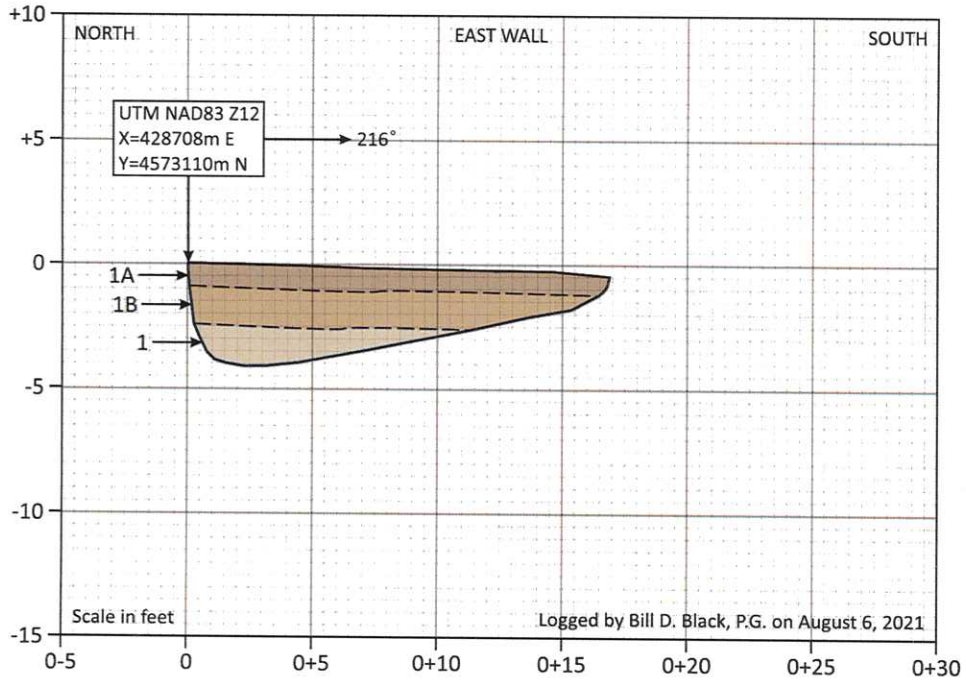
TEST PIT LOGS, 63 AND 64

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4F

WESTERN GEOLOGIC

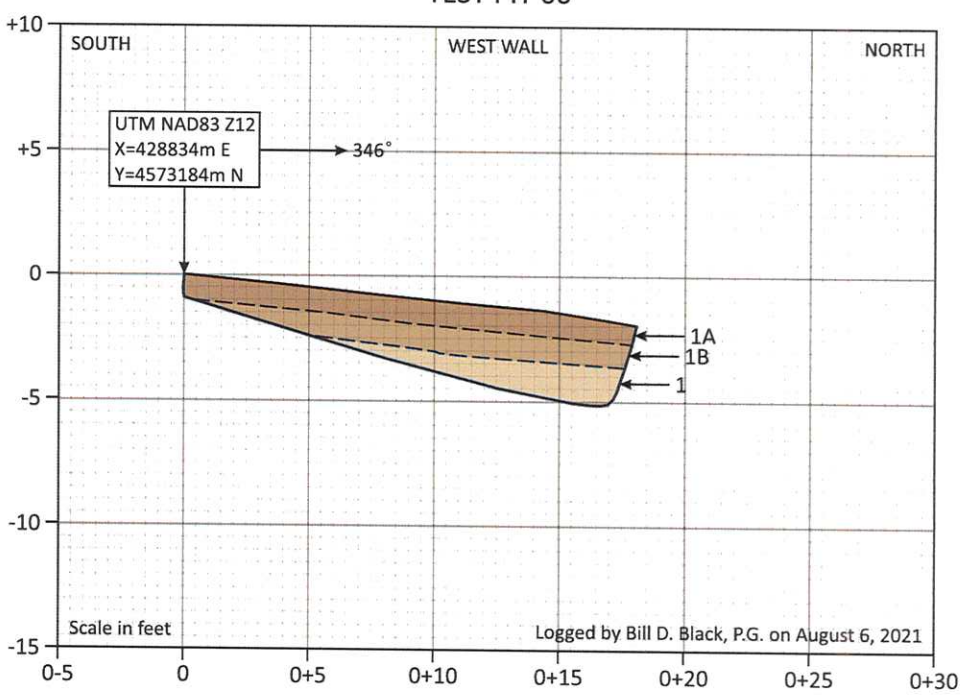
TEST PIT 65



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - reddish-brown to brown, strong, massive, weathered, matrix-supported tuffaceous conglomerate with subangular qaurtzite clasts with stage II carbonate; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 66



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation*- brown to dark brown, strong to very strong, massive, weathered claystone; A and B soil horizons formed in unit (1A and 1B).

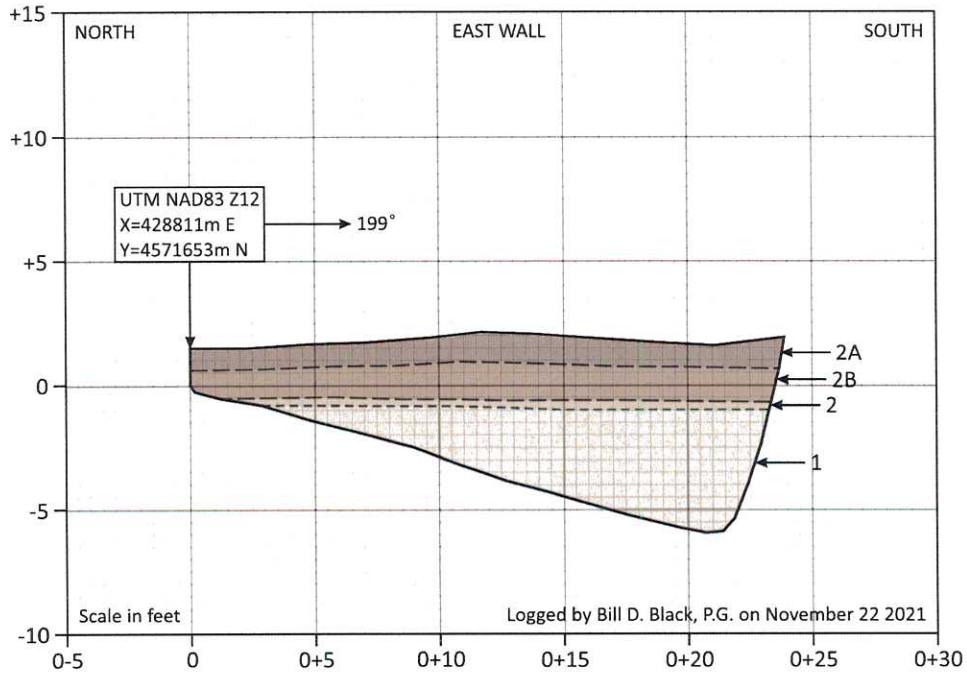
WESTERN GEOLOGIC

TEST PIT LOGS, 65 AND 66

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4G

TEST PIT 67



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown, orange-brown and light reddish-brown, strong to very strong, massive, weathered tuffaceous conglomerate.

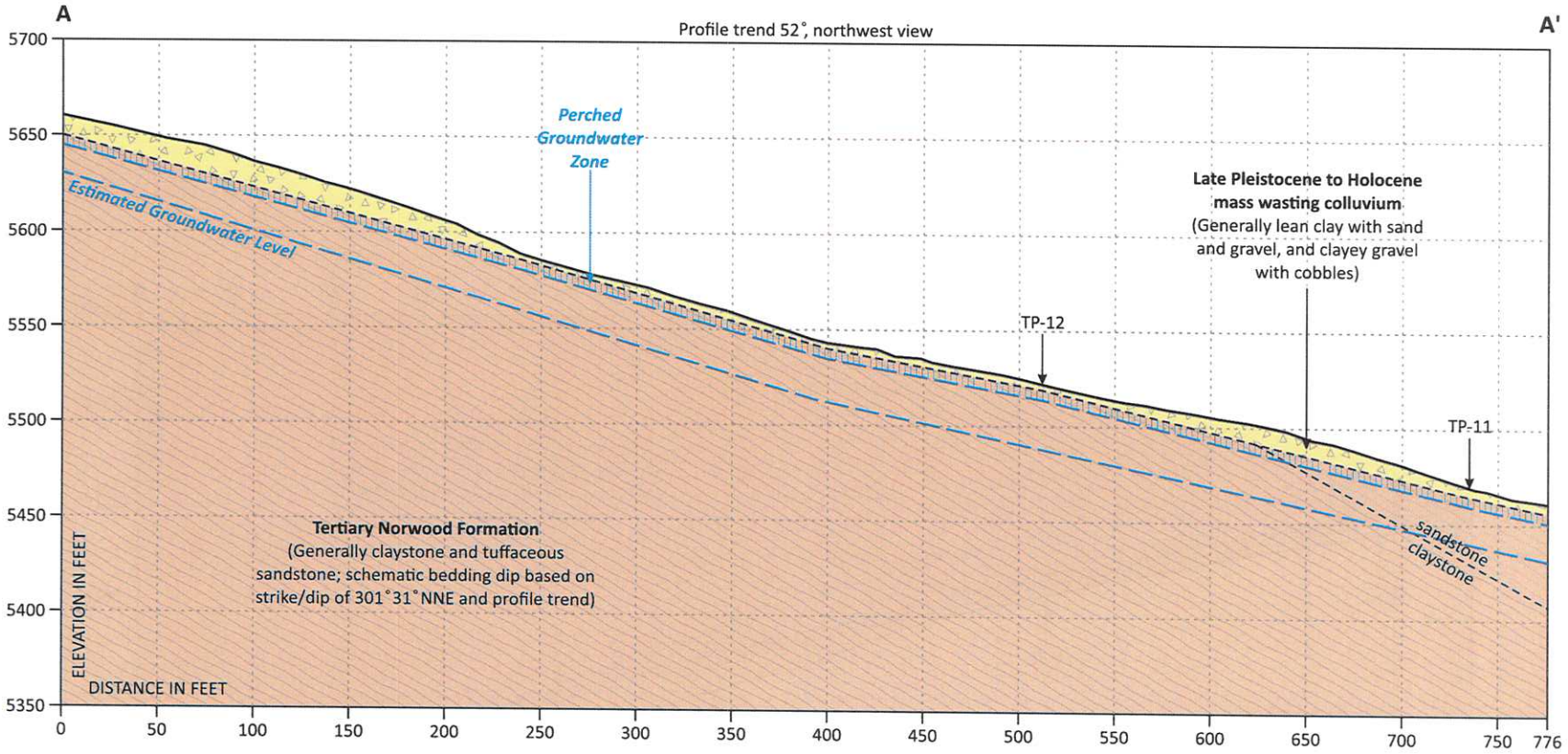
Unit 2. *Late Pleistocene mass wasting colluvium* - reddish-brown to dark grayish-brown, medium dense, massive, clayey gravel (GC) with trace subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 2.5 to 3 feet thick.

TEST PIT LOG 67

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 4H

WESTERN GEOLOGIC



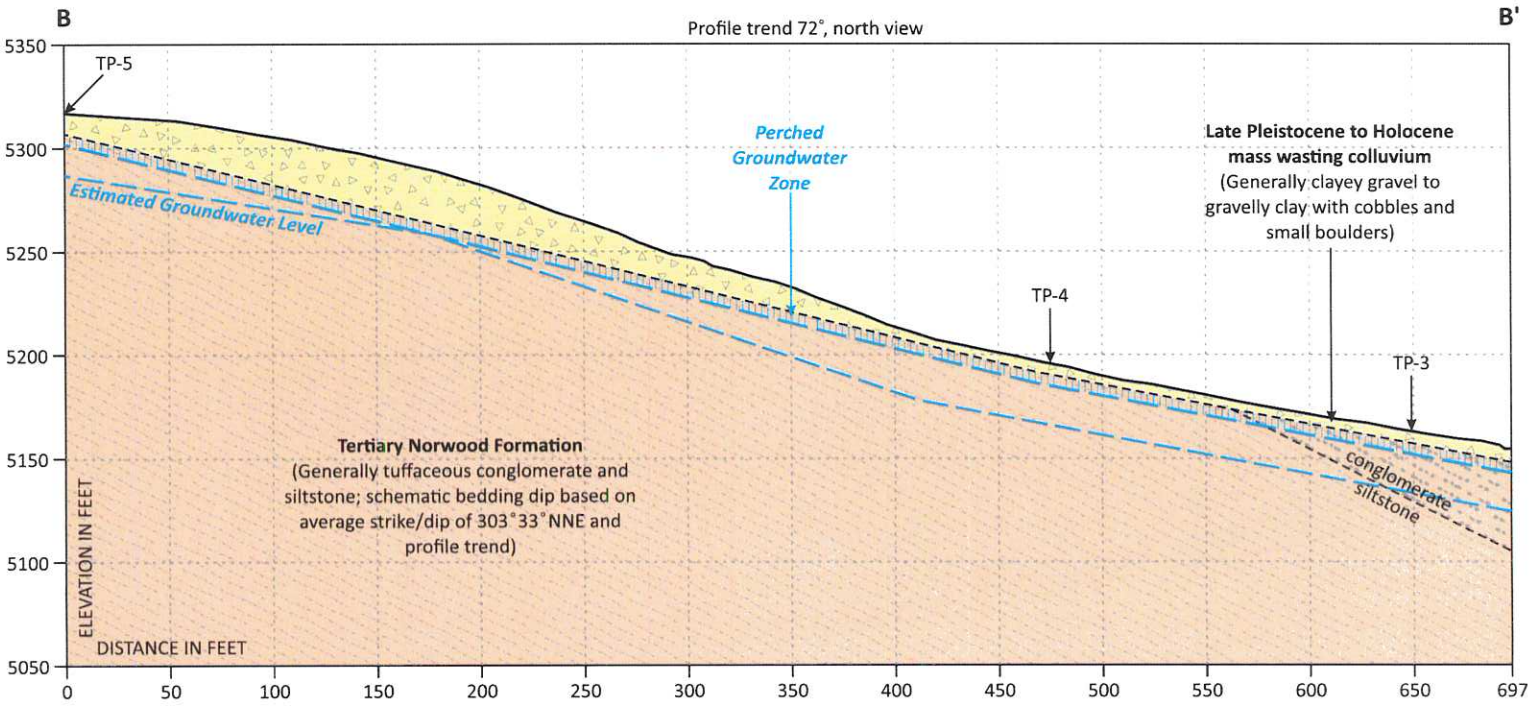
GEOLOGIC CROSS SECTION A-A'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5A

WESTERN GEOLOGIC

Scale 1 inch equals 60 feet (1:720) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



GEOLOGIC CROSS SECTION B-B'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5B

WESTERN GEOLOGIC

Scale 1 inch equals 60 feet (1:720) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

5.0 SITE CHARACTERIZATION

Site conditions and geology were interpreted through an integrated compilation of data, including a review of literature and mapping from previous studies conducted in the area (Western Geologic, 2006, 2018a and 2018b; Coogan and King, 2016; and McDonald, 2020); excavation, logging and field interpretation of 67 test pits; field reconnaissance of the site in conjunction with the subsurface exploration; photogeologic analyses of 2012 high-resolution aerial imagery; and GIS analyses of geoprocessed 2016 LIDAR terrain data.

5.1 Subsurface Investigation

Sixty-seven walk-in test pits (short trenches) were excavated at the Project to assess subsurface conditions. The test pits were logged by Bill D. Black, P.G., of Western Geologic July 27 through August 6, and on November 22, 2021, concurrently with the Project geotechnical investigation conducted by Christensen Geotechnical. Locations of the test pits are shown on Plate 1. The test pit locations were measured using a hand-held GPS unit and by trend and distance methods. The test pits were logged at a scale of 1-inch equals five feet (1:60) following methodology in McCalpin (1996), and digitally photographed at 5-foot intervals to document the exposures. The photos are not provided herein, but are available on request. Logs of the test pits are provided on Figures 3A-3Z and Figures 4A-4H. Stratigraphic interpretations and descriptions are provided on the logs. Explored depth was limited in some test pits due to excavation refusal.

Except for TP-11, no groundwater was observed in the test pits to their explored depths. However, iron-oxide staining or highly weathered bedrock suggestive of seasonal perched groundwater was observed in TP-4, TP-15, and TP-36. Weathered bedrock was exposed in all of the test pits, except for TP-5, TP-9, TP-29, TP-37, TP-50 and TP-58. The bedrock was generally overlain by late Pleistocene mass wasting colluvium. Holocene mass wasting colluvium was observed in TP-2, TP-28, TP-29 and TP-30. Late Pleistocene to Holocene mixed alluvium and colluvium was observed in TP-37, TP-40 and TP-50.

5.2 Empirical Observations

On July 27 through August 6, and on November 22, 2021, Mr. Bill D. Black, P.G., of Western Geologic conducted a reconnaissance of the property to observe geomorphic and surficial conditions. Weather conditions varied. Due to the large Project size, steep slopes and heavy vegetation in some areas, not all areas of the Project were accessed or observable.

The site is on the western margin of Ogden Valley on slopes overlooking Ogden Valley. Native vegetation consists of mature trees, various brush, broadleaf weeds and grasses. Two perennial streams (Coal Hollow and Grover Hollow creeks) cross the Project, and several intermittent and ephemeral drainages also head within the Project. There are also several small seasonal ponds at the Project and at least three reported spring areas. Both perennial drainages were flowing at the time of our field investigation, although the ponds and intermittent drainages all appeared dry. Slopes at the site are steep and heavily

vegetated in some areas. Much of the site is typified by eroded landslide deposits overlying and encircling various weathered bedrock knobs and ridges. The landslide morphology appeared subdued. No evidence for recent or ongoing landslides or slope instability was observed. Except for the above and various areas of alluvial and colluvial deposition along Coal Hollow and Grover Hollow creeks, likely from seasonal floods, no evidence of other geologic hazards was observed.

5.3 Air Photo Observations

High-resolution color orthophotography from 2012 and bare earth DEM LIDAR imagery from 2016 were reviewed to obtain information about the geomorphology of the Project area. The 2012 aerial imagery and LIDAR analysis are provided on Plates 1 and 2 at a scale of 1 inch equals 400 feet (1:4,800). Surficial geology of the Project is shown on Plate 3 based on the mapping in Coogan and King (2016, Figure 2A), McDonald (2020, Figure 2B), and our onsite subsurface data, empirical observations, and air photo interpretation. Plate 2 shows slope steepness and aspect varies across at the site, though much of the site is on slopes gentler than 20 percent (5:1 horizontal to vertical; unshaded areas).

The Project is in an area underlain mainly by Tertiary-age Norwood Formation bedrock with a veneer of mass wasting colluvium from various pre- and post-Lake Bonneville landslides. Most of the landslide deposits likely predate when Lake Bonneville occupied Ogden Valley. Thickness of the colluvium varies, but is generally less than 10 feet. However, four Holocene-age landslide deposits are present in the southwest and north parts of the Project (unit Qmsy, Plates 1-3). TP-29 and TP-30 in one of these landslides showed evidence for multiple movement episodes. Coal Hollow and Grover Hollow creeks also flow across the Project. No alluvial fans are mapped at the site, but several areas of mixed alluvial and colluvial deposits are found along the creeks, likely from seasonal floods (unit Qac, Plates 1-3). We anticipate that these creeks are mainly transport and erosion zones for small debris flow and floods, with deposition principally in the alluvial fans (unit Qafy, Plates 1-3) in Ogden Valley east of the Project. The Ogden Valley southwestern margin fault crosses the southwest and west parts of the Project, but is concealed beneath late Pleistocene to Holocene surficial deposits and only approximately located (Plates 1-3, dotted bold line). Sullivan and others (1986) indicate the most recent movement on this fault is pre-Holocene. No evidence for other geologic hazards was observed on the air photos at the site or in the area.

5.4 Cross Sections

Figures 5A-5R show 18 geologic cross sections (A-A' through R-R'), as located on Plates 1-3, across various steep slopes at the site shown on Plate 2. Units and contacts are inferred based on subsurface data from the test pits (Figures 3A-Z and 4A-H), and the surficial geologic mapping on Plate 3. The topographic profiles are based on geoprocessed 2016 LIDAR data. The LIDAR data provide a snapshot of topographic conditions at the time of acquisition; past, present and future surficial topography may vary. Bedding dips were determined using https://app.visiblegeology.com/apparentDip.html based on the cross section trend and test pit strike/dip data. We caution that the cross sections are based on

limited subsurface data, particularly given the depth of exploration. Units and contacts should therefore be considered approximate and inferred, and variations should be expected at depth and laterally. Groundwater in the cross sections is inferred to be at a depth of about 30 feet (as discussed in Section 3.0), varying with topography. A perched groundwater zone is also shown in the upper 5 feet of the weathered bedrock.

6.0 GEOLOGIC HAZARDS

Assessment of potential geologic hazards and the resulting risks imposed is critical in determining the suitability of the site for development. Table 1 below shows a summary of the geologic hazards reviewed at the site, as well as a relative (qualitative) assessment of risk to the Project for each hazard.

Table 1. *Geologic hazards summary.*

Hazard	H	M	L
Earthquake Ground Shaking	X		
Surface Fault Rupture			X
Liquefaction and Lateral-spread Ground Failure			X
Tectonic Deformation			X
Seismic Seiche and Storm Surge			X
Stream Flooding			X
Shallow Groundwater		X	
Landslides and Slope Failures	X		
Debris Flows and Floods			X
Rock Fall			X
Problem Soil and Rock	X		

A "high" hazard rating (H) indicates a hazard is present at the site (whether currently or in the geologic past) that is likely to pose significant risk and/or may require further study or mitigation techniques. A "moderate" hazard rating (M) indicates a hazard that poses an equivocal risk. Moderate-risk hazards may also require further studies or mitigation. A "low" hazard rating (L) indicates the hazard is not present, poses little or no risk, and/or is not likely to significantly impact the Project. Low-risk hazards typically require no additional studies or mitigation. We note that these hazard ratings represent a conservative assessment for the entire site and risk may vary in some areas. Careful selection of development areas can minimize risk by avoiding known hazard areas.

6.1 Earthquake Ground Shaking

Ground shaking refers to the ground surface acceleration caused by seismic waves generated during an earthquake. Strong ground motion is likely to present a significant risk during moderate to large earthquakes located within a 60 mile radius of the Project area (Boore and others, 1993). Seismic sources include mapped active faults, as well as a

random or "floating" earthquake source on faults not evident at the surface. The Utah Geological Survey Quaternary Fault Database (Black and others, 2003; January 2017 update) shows numerous class A faults within 60 miles of the Project that may pose potential seismic sources.

The extent of property damage and loss of life due to ground shaking depends on factors such as: (1) proximity of the earthquake and strength of seismic waves at the surface (horizontal motions are the most damaging); (2) amplitude, duration, and frequency of ground motions; (3) nature of foundation materials; and (4) building design. Based on 2018 IBC provisions, a site class of C (stiff soil), and a risk category of II, calculated seismic values for the site (centered on 41.296973° N, -111.839527° W) are summarized below:

Table 2. *Seismic hazards summary.*

Type	Value
S_S	*0.984 g*
S_1	*0.352 g*
S_{MS} (F_a x S_S)	*1.18 g*
S_{M1} (F_v x S_1)	*0.528 g*
S_{DS} (2/3 x S_{MS})	*0.787 g*
S_{D1} (2/3 x S_{M1})	*0.352 g*
Seismic Design Category, SDC	*D*
Site Coefficient, F_a	*= 1.2*
Site Coefficient, F_v	*= 1.5*
Site-Modified Peak Ground Acceleration, PGA_M	*= 0.524 g*

Given the above information, we rate the hazard from earthquake ground shaking as high. Earthquake ground shaking is a regional hazard common to all Wasatch Front areas. The hazard is mitigated by design and construction of homes in accordance with the current adopted building code. The PGA_M for the site in Table 2 is more than 100 times that reportedly experienced in Ogden Valley (0.005 g) from the March 18, 2020 M 5.7 Magna earthquake.

6.2 Surface Fault Rupture

Movement along faults at depth generates earthquakes. During earthquakes larger than Richter magnitude 6.5, ruptures along normal faults in the intermountain region generally propagate to the surface (Smith and Arabasz, 1991) as one side of the fault is uplifted and the other side down dropped. The resulting fault scarp has a near-vertical slope. The surface rupture may be expressed as a large singular rupture or several smaller ruptures in a broad zone. Ground displacement from surface fault rupture can cause significant damage or even collapse to structures located on an active fault.

No active faults are mapped crossing the site or were observed during our reconnaissance or on air photos. The Ogden Valley southwestern margin fault is mapped crossing the southwestern and western parts of the Project, but is concealed and shows no evidence of Holocene activity (Sullivan and others, 1988). The Utah Geological Survey Quaternary Fault and Fold Database for Utah (Black and others, 2003) indicates the nearest active fault to the Project is the Weber section of the Wasatch fault zone 3.9 miles to the west. Given all the above, we rate the existing risk from surface faulting as low. No additional investigation regarding surface faulting appears needed given the proposed development and current paleoseismic information.

6.3 Liquefaction and Lateral-Spread Ground Failure

Liquefaction occurs when saturated, loose, cohesionless, soils lose their support capabilities during a seismic event because of the development of excessive pore pressure. Earthquake-induced liquefaction can present a significant risk to structures from bearing-capacity failures to structural footings and foundations, and can damage structures and roadway embankments by triggering lateral spread landslides. Earthquakes of Richter magnitude 5 are generally regarded as the lower threshold for liquefaction. Liquefaction potential at the site is a combination of expected seismic accelerations (earthquake ground shaking), groundwater conditions, and presence of susceptible soils.

Given subsurface soil conditions observed in the test pits (Figures 3A-3Z and 4A-4H) and the site-specific geologic mapping on Plate 3, we rate the risk from liquefaction as low. Weber County GIS mapping shows the site is in an area of very low liquefaction potential (code 1).

6.4 Tectonic Deformation

Tectonic deformation refers to subsidence from warping, lowering, and tilting of a valley floor that accompanies surface-faulting earthquakes on normal faults. Large-scale tectonic subsidence may accompany earthquakes along large normal faults (Lund, 1990). Tectonic subsidence is believed to mainly impact those areas immediately adjacent to the downthrown side of active normal faults.

The Project is not in close proximity to and on the downthrown side of any mapped active (Holocene) faults. Based on this, we rate the risk from tectonic subsidence as low.

6.5 Seismic Seiche and Storm Surge

Earthquake-induced seiche presents a risk to structures within the wave-oscillation zone along the edges of large bodies of water, such as the Great Salt Lake. Given the elevation of the subject property and distance from large bodies of water, we rate the risk from seismic seiches as low.

6.6 Stream Flooding

Stream flooding may be caused by direct precipitation, melting snow, or a combination of both. In much of Utah, floods are most common in April through June during spring snowmelt. High flows may be sustained from a few days to several weeks, and the potential for flooding depends on a variety of factors such as surface hydrology, site grading and drainage, and runoff.

Federal Emergency Management Agency flood insurance rate mapping (Map Number 49057C0236F, effective on 06/02/2015; and 49057C0237F, effective 06/02/2015) classifies the Project in "Zone X" (areas of minimal flood hazards). However, two perennial drainages (Coal Hollow and Grover Hollow creeks) flow across the Project. Areas adjacent to these drainages may be subject to localized seasonal or flash flooding. Coal Hollow and Grover Hollow creeks are currently identified as drainages #4 and #5 on sheet DR1 in the June 22, 2021 Gardner Engineering preliminary plan set. The drainage plan overview shows a 50-foot setback around the creeks. Based on the FEMA mapping and current civil engineering design for the development, we rate the risk from stream flooding as low. Care should be taken that proper surface drainage is maintained.

6.7 Shallow Groundwater

Except for TP-11, no groundwater was encountered in the test pits at the site. However, several test pits exposed evidence for past possible perched shallow groundwater (as discussed in Section 5.1). Although no onsite groundwater information was found available, five water wells are near the eastern Project boundary (Figure 1). The drillers' logs for these wells report static groundwater depths of from 25 to 50 feet, with a mean depth of 36.6 feet and a median depth of 30 feet. We anticipate groundwater conditions at the Project to be similar, though depths may vary locally and seasonally from snowmelt runoff and annually from climatic fluctuations, which would be typical for an alpine environment. Our test pit data indicate perched conditions above less-permeable, clay-rich bedrock layers may also be locally present in the subsurface. Given all the above, we rate the risk from shallow groundwater as moderate. The Project geotechnical engineer should evaluate the need for a foundation drainage system to ensure that proper subsurface drainage is maintained.

6.8 Landslides and Slope Failures

Slope stability hazards such as landslides, slumps, and other mass movements can develop along moderate to steep slopes where a slope has been disturbed, the head of a slope loaded, or where increased groundwater pore pressures result in driving forces within the slope exceeding restraining forces. Slopes exhibiting prior failures, and also deposits from large landslides, are particularly vulnerable to instability and reactivation.

The Project is in an area underlain mainly by Tertiary-age Norwood Formation bedrock with a veneer of mass wasting colluvium from various pre- and post-Lake Bonneville landslides. Much of the site is typified by eroded landslide deposits overlying and encircling various weathered bedrock knobs and ridges. The landslide morphology appeared subdued and no evidence for recent or ongoing landslides or slope instability was

observed. Colluvial thicknesses are shown on the test pit logs (Figures 3A-3Z and 4A-4H) and were generally less than 10 feet, except in TP-5, TP-9 and TP-29. Mixed alluvium and colluvium was also encountered in test pits TP-37 and TP-50 that extended below the depth of excavation. Four Holocene-age landslide deposits are also present in the southwest and north parts of the Project (unit Qmsy, Plates 1 and 3). Test pits TP-29 and TP-30 in one of these landslides showed evidence for multiple depositional events. Plate 2 shows slopes at the site vary in aspect and steepness, though much of the site appears to be on gentle slopes with a steepness less than 20 percent (unshaded). The young landslides originated in slopes exceeding 20 percent steepness.

Given the above, we rate the risk from landslides and slope instability as high. We recommend that slope stability be evaluated by the Project geotechnical engineer based on site-specific soil conditions and the data provided in this report. Recommendations should be provided to reduce the landslide hazard risk if factors of safety are determined to be unsuitable. We further recommend that: (1) no structures be constructed on a slope that shows an average gradient greater than 30 percent over a 50-foot span; (2) no structures be constructed on the young landslides (unit Qmsy) on Plates 1-3; and (3) a site-specific geologic and geotechnical assessment be conducted for structures that will be located on a slope that shows an average gradient greater than 20 percent over a 50-foot span. Water, steep man-made cuts, and non-engineered fill materials are often major contributors to slope instability. Care should be taken to maintain proper site drainage, that site grading does not destabilize slopes at the site without prior geotechnical analysis and grading plans, and that water from man-made sources is minimized in potentially unstable slope areas.

6.9 Debris Flows

Debris flow hazards are typically associated with unconsolidated alluvial fan deposits at the mouths of large range-front drainages, such as those along the Wasatch Front. Debris flows have historically caused significant damage in the Wasatch Front area.

Coal Hollow and Grover Hollow creeks flow across the Project. No onsite alluvial fans are mapped associated with these drainages, but several areas of mixed alluvial and colluvial deposits are mapped along the creeks that may be from seasonal floods (unit Qac, Plates 1-3) and test pit TP-50 near Coal Hollow creek (Plate 1) exposed mixed alluvium and colluvium that extended below the depth of excavation. We anticipate that these creeks are mainly transport and erosion zones for small debris flow and floods, with deposition locally along the creek and in the offsite alluvial fans (unit Qafy, Plates 1-3) downslope further east. Given that areas near the creeks are also in a 50-foot stream setback zone, the hazard from debris transport and erosion appears minimal. Given this, we rate the risk from debris flows and floods as low.

6.10 Rock Fall

No significant bedrock outcrops are at the site or in adjacent higher slopes that could present a source area for rock fall clasts, and no boulders likely from rock falls were observed at the site. Based on the above, we rate the hazard from rock falls as low.

6.11 Problem Soil and Rock

Clay-rich surficial soils and weathered bedrock possibly susceptible to a high degree of shrinking/swelling were observed in numerous test pits at the Project. Given the above, we rate the risk from problem soil and rock as high. Soil conditions and specific recommendations for site grading, subgrade preparation, and footing and foundation design should be provided in the Project geotechnical engineering evaluation.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Earthquake ground shaking, landslides and slope stability, and problem soil and rock are identified as posing a high relative risk to the Project. Shallow groundwater also poses a moderate (equivocal) risk. The following recommendations are provided with regard to the geologic characterizations in this report:

- ***Seismic Design*** – All habitable structures developed at the property should be constructed to current adopted seismic building codes to reduce the risk of damage, injury, or loss of life from earthquake ground shaking. The Project geotechnical engineer should confirm the ground shaking hazard and provide appropriate seismic design parameters as needed. Earthquake ground shaking is a hazard that is common for all development along the Wasatch Front.

- ***Geotechnical Evaluation*** – A design-level geotechnical engineering study should be conducted prior to construction to assess soil foundation conditions, provide recommendations regarding subsurface drainage, and evaluate slope stability. The stability evaluation should be based on geologic characterizations in this report and site-specific geotechnical data, and provide recommendations for reducing the risk of landsliding if the factors of safety are deemed unsuitable.

- ***Non-buildable Areas and Additional Investigations*** – No structures should be constructed on a slope that shows an average gradient greater than 30 percent over a 50-foot span, or on the young landslides (unit Qmsy) on Plates 1-3. A site-specific geologic and geotechnical assessment should be conducted if any structure will be located on a slope that shows an average gradient greater than 20 percent over a 50-foot span.

- ***Site Modifications and Drainage*** – No unplanned cuts should be made in the slopes at the site without prior geotechnical analyses, and proper surface and subsurface drainage should be maintained. We recommend that final site drainage and grading plans be reviewed by a licensed geologist and geotechnical engineer.

- ***Excavation Backfill Considerations*** – The test pits may be in areas where a structure could subsequently be placed. However, backfill may not have been replaced in the excavations in compacted layers. The fill could settle with time and upon saturation. Should structures be located in an excavated area, no footings or structure should be founded over the excavation unless the backfill has been removed and replaced with structural fill.

- ***Hazard Disclosures and Report Availability*** – All hazards identified as posing a high risk at the site should be disclosed to future buyers so that they may understand and be willing to accept any potential developmental challenges and/or risks posed by these hazards. This report should be made available to architects, building contractors, and in the event of a future property sale, real estate agents and potential buyers. The report should be referenced for information on technical data only as interpreted from

observations and not as a warranty of conditions throughout the site. The report should be submitted in its entirety, or referenced appropriately, as part of any document submittal to a government agency responsible for planning decisions or geologic review. Incomplete submittals void the professional seals and signatures we provide herein. Although this report and the data herein are the property of the client, the report format is the intellectual property of Western Geologic and should not be copied, used, or modified without express permission of the authors.

8.0 REFERENCES

Anderson, R.E., 1989, Tectonic evolution of the intermontane system--Basin and Range, Colorado Plateau, and High Lava Plains, *in* Pakiser, L.C., and Mooney, W.D., editors, Geophysical framework of the continental United States: Geological Society of America Memoir 172, p. 163-176.

Arabasz, W.J., Pechmann, J.C., and Brown, E.D., 1992, Observational seismology and evaluation of earthquake hazards and risk in the Wasatch Front area, Utah, *in* Gori, P.L. and Hays, W.W., editors, Assessment of Regional Earthquake Hazards and Risk along the Wasatch Front, Utah: Washington, D.C, U.S. Geological Survey Professional Paper 1500-D, Government Printing Office, p. D1-D36.

Avery, Charles, 1994, Ground-water hydrology of Ogden Valley and surrounding area, eastern Weber County, Utah and simulation of ground-water flow in the valley-fill aquifer system: Utah Department of Natural Resources, Technical Publication no.99, 84 p.

Black, B.D., Hecker, Suzanne, Hylland, M.D., Christenson, G.E., and McDonald, G.N., 2003, Quaternary fault and fold database and map of Utah: Utah Geological Survey Map 193DM, CD-ROM.

Boore, D.M., Joyner, W.B., and Fumal, T.E., 1993, Estimation of Response Spectra and Peak Acceleration from Western North America Earthquakes--An interim report: U.S. Geological Survey Open-File Report 93-509.

Bowman, S.D., and Lund, W.R., 2016, Guidelines for conducting engineering-geology investigations and preparing engineering-geology reports in Utah, *in* Bowman, S.D., and Lund, W.R., editors, Guidelines for investigating geologic hazards and preparing engineering-geology reports, with a suggested approach to geologic-hazard ordinances in Utah: Utah Geological Survey Circular 122, p. 15–30.

Coogan, J.C., and King, J.K., 2016, Interim Geologic Map of the Ogden 30' x 60' Quadrangle, Box Elder, Cache, Davis, Morgan, Rich, and Summit Counties, Utah, and Uinta County, Wyoming: Utah Geological Survey Open-File Report 653DM, scale 1:100,000, 141 p. with appendices.

Gilbert, G.K., 1928, Studies of Basin and Range Structure: U.S. Geological Survey Professional Paper 153, 89 p.

Gwynn, J.W. (Editor), 1980, Great Salt Lake--A scientific, historical, and economic overview: Utah Geological Survey Bulletin 166, 400 p.

Jarrett, R.D., and Malde, H.E., 1987, Paleodischarge of the late Pleistocene Bonneville flood, Snake River, Idaho, computed from new evidence: Geological Society of America Bulletin, v. 99, p. 127-134.

Lund, W.R. (Editor), 1990. Engineering geology of the Salt Lake City metropolitan area, Utah: Utah Geological and Mineral Survey Bulletin 126, 66 p.

McCalpin, J.P., 1996, Paleoseismology: San Diego, California, Academic Press Inc., Volume 62 of the International Geophysical Series, 588 p.

McDonald, G.N., 2020, Interim geologic map of surficial deposits in the Huntsville Quadrangle, Weber and Cache Counties, Utah: Utah Geological Survey Contract Deliverable, USGS STATEMAP award number G19AC00228 (2019–20), 21 p., scale 1:24,000.

Miller, D.M., 1990, Mesozoic and Cenozoic tectonic evolution of the northeastern Great Basin, *in* Shaddrick, D.R., Kizis, J.R., and Hunsaker, E.L. III, editors, Geology and Ore Deposits of the Northeastern Great Basin: Geological Society of Nevada Field Trip No. 5, p. 43-73.

O'Connor, J.E., 1993, Hydrology, hydraulics, and geomorphology of the Bonneville flood: Geological Society of America Special Paper 274, 83 p.

Oviatt, C.G., 2015, Chronology of Lake Bonneville, 30,000 to 10,000 yr B.P.: Quaternary Science Reviews, v. 110 (2015), p. 166-171.

Oviatt, C.G., Currey, D.R., and Sack, Dorothy, 1992, Radiocarbon chronology of Lake Bonneville, Eastern Great Basin, USA: Paleogeography, Paleoclimatology, Paleoecology, v. 99, p. 225-241.

Sbar, M.L., Barazangi, M., Dorman, J., Scholz, C.H., and Smith, R.B., 1972, Tectonics of the Intermountain Seismic Belt, western United States--Microearthquake seismicity and composite fault plane solutions: Geological Society of America Bulletin, v. 83, p. 13-28.

Smith, R.B., and Arabasz, W.J., 1991, Seismicity of the Intermountain Seismic Belt, *in* Slemmons, D.B., Engdahl, E.R., Zoback, M.D., and Blackwell, D.D., editors, Neotectonics of North America: Geological Society of America, Decade of North American Geology Map v. 1, p. 185-228.

Smith, R.B. and Sbar, M.L., 1974, Contemporary tectonics and seismicity of the western United States with emphasis on the Intermountain Seismic Belt: Geological Society of America Bulletin, v. 85, p. 1205-1218.

Stewart, J.H., 1978, Basin-range structure in western North America, a review, *in* Smith, R.B., and Eaton, G.P., editors, Cenozoic tectonics and regional geophysics of the western Cordillera: Geological Society of America Memoir 152, p. 341-367.

____, 1980, Geology of Nevada: Nevada Bureau of Mines and Geology Special Publication 4.

Stokes, W.L., 1977, Physiographic subdivisions of Utah: Utah Geological and Mineral Survey Map 43, scale 1:2,400,000.

____, 1986, Geology of Utah: Salt Lake City, University of Utah Museum of Natural History and Utah Geological and Mineral Survey, 280 p.

Sullivan, J.T., Nelson, A.R., LaForge, R.C., Wood, C.K., and Hansen, R.A., 1986, Regional seismotectonic study for the back valleys of the Wasatch Mountains in northeastern Utah: Denver, Colorado, U.S. Bureau of Reclamation, Seismotectonic Section, Division of Geology, Engineering and Research Center, unpublished report, 317 p.

Western Geologic, 2006, Geologic Hazards Evaluation--Moose Mountain Estates, Eden, Weber County, Utah: unpublished consultant's report prepared for Earthtec Testing & Engineering dated October 16, 2006, 16 p.

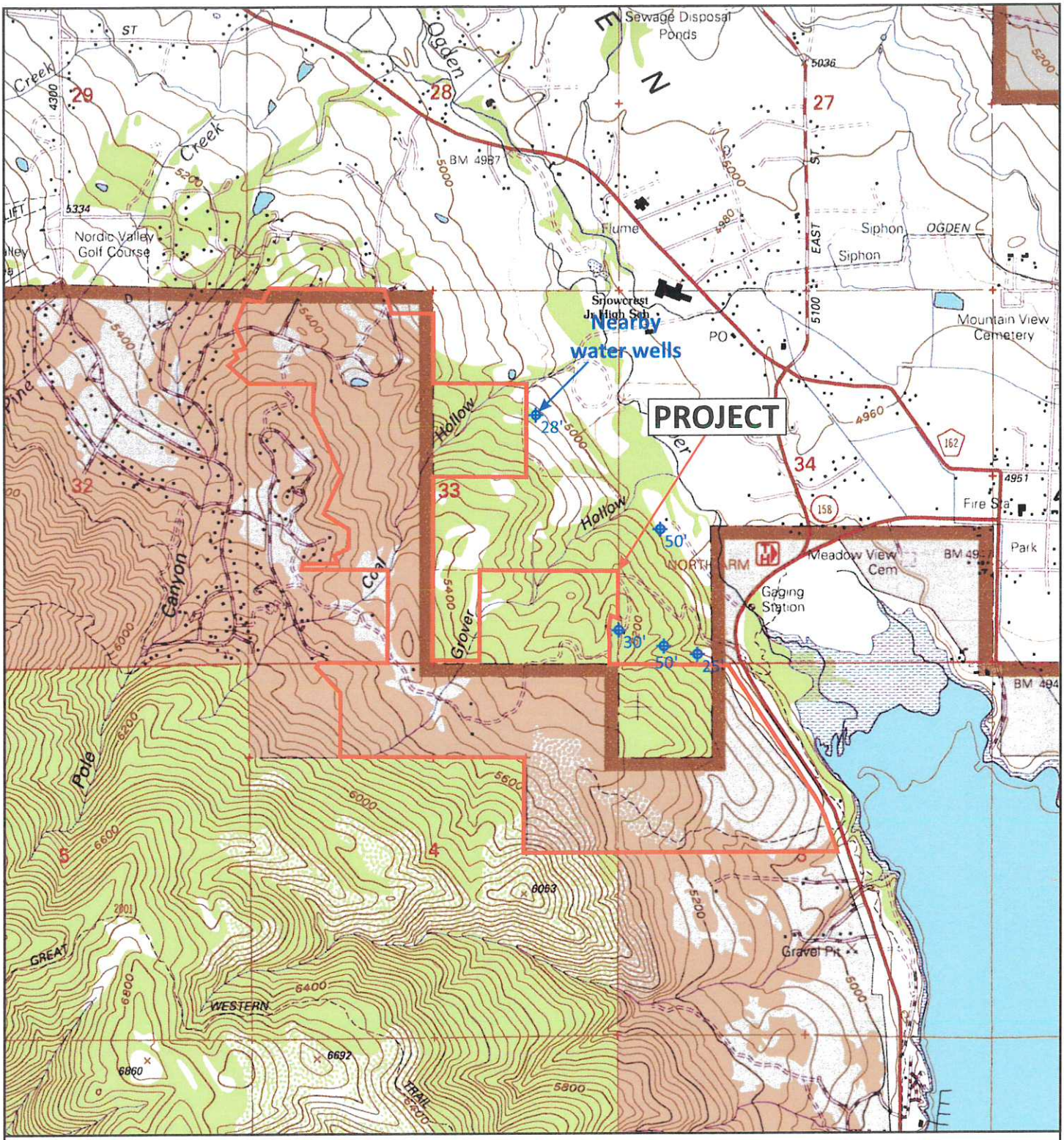
____, 2018a, Geologic Hazards Evaluation-- Beckstead Property, About 1860 North Big Sky Drive, Eden, Weber County, Utah: unpublished consultant's report prepared for Mr. Brandon Janis dated October 8, 2018, Job No. 4793, 21 p. with test pit logs.

____, 2018b, Geologic Hazards Evaluation—WAJ Enterprises Property, About 2050 North Big Sky Drive, Liberty, Weber County, Utah: unpublished consultant's report prepared for Mr. Brandon Janis dated October 4, 2018, Job No. 4783, 22 p. with test pit logs.

Zoback, M.L., 1989. State of stress and modern deformation of the northern Basin and Range province: Journal of Geophysical Research, v. 94, p. 7105-7128.

Zoback, M.L. and Zoback, M.D., 1989. Tectonic stress field of the conterminous United States: Boulder, Colorado, Geological Society of America Memoir, v. 172, p. 523-539.

FIGURES



Source: U.S. Geological Survey 7.5 Minute Series Topographic Maps, Utah - Huntsville, 1998; Project location Sections 3, 4, 32 and 33, Township 7 North, Range 1 East (SLBM).

WESTERN GEOLOGIC

N
W E
S

0 1000 2000 feet

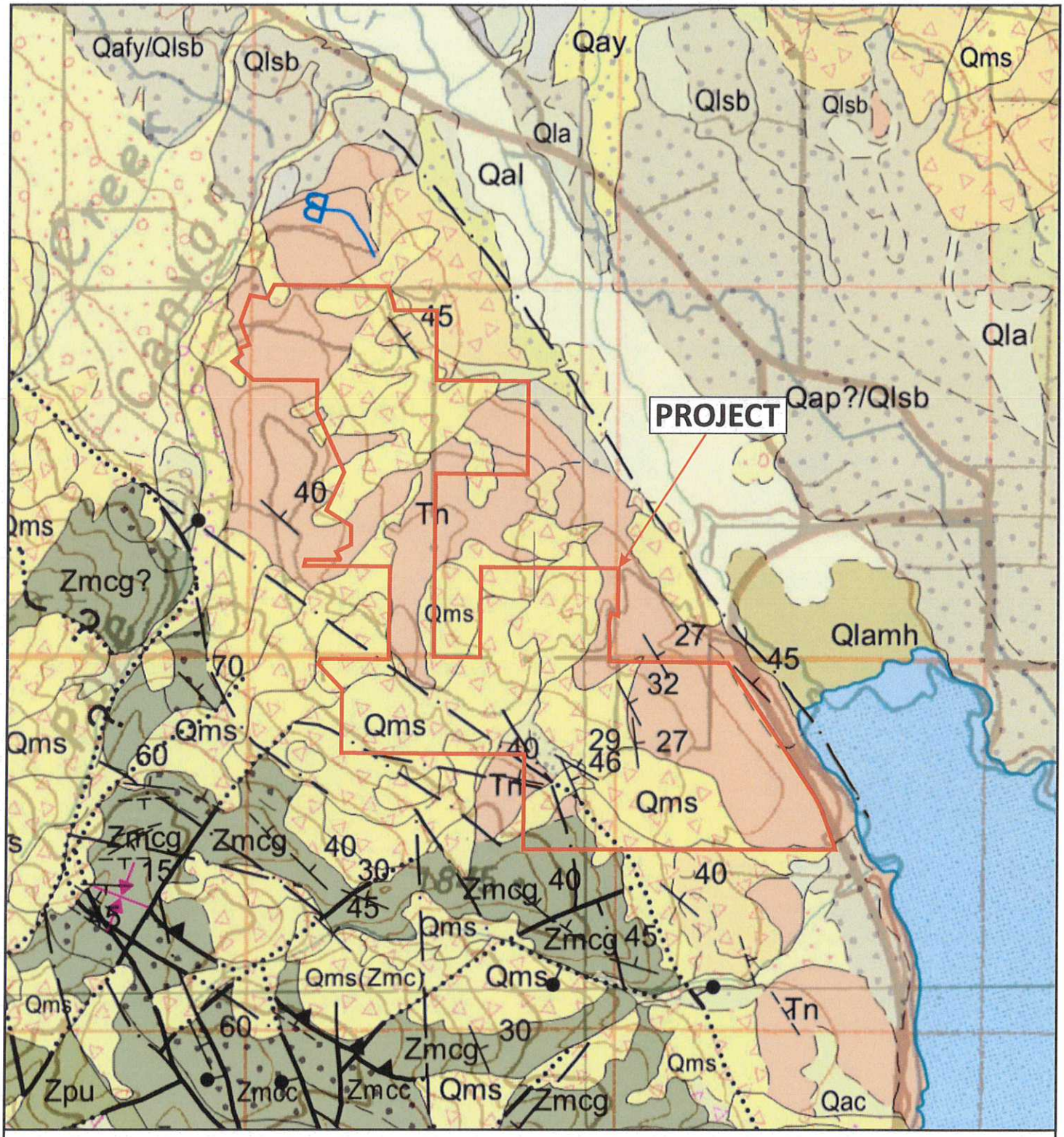
Scale 1:24,000
(1 inch = 2000 feet)

LOCATION MAP

GEOLOGIC HAZARDS EVALUATION

Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 1



Source: Coogan and King (2016), original map scale 1:100,000. See text for explanation of nearby surficial geologic units.

WESTERN GEOLOGIC

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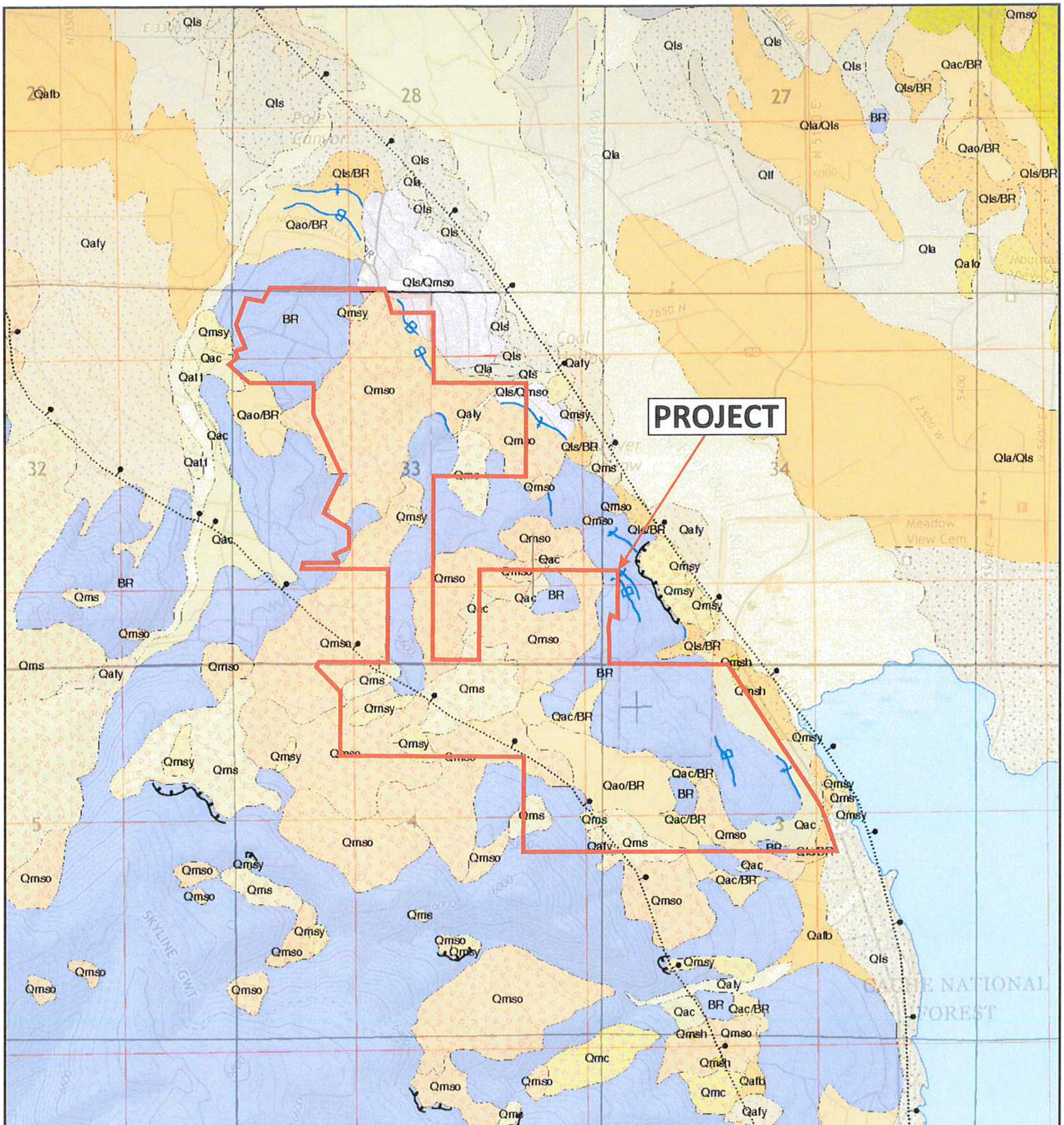
0 1000 2000 feet

Scale 1:24,000
(1 inch = 2000 feet)

REGIONAL GEOLOGIC MAP

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 2A



Source: McDonald (2020), original map scale 1:24,000. See text for explanation of onsite surficial geologic units.

WESTERN GEOLOGIC

N
W E
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0 1000 2000 feet

Scale 1:24,000
(1 inch = 2000 feet)

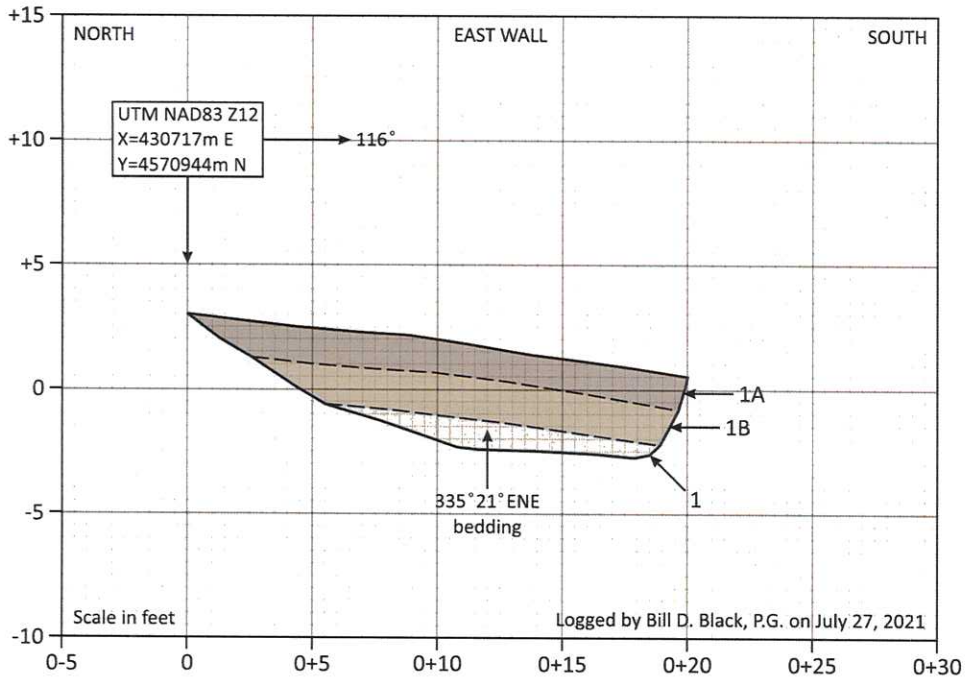
SURFICIAL GEOLOGIC MAP

GEOLOGIC HAZARDS EVALUATION

Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 2B

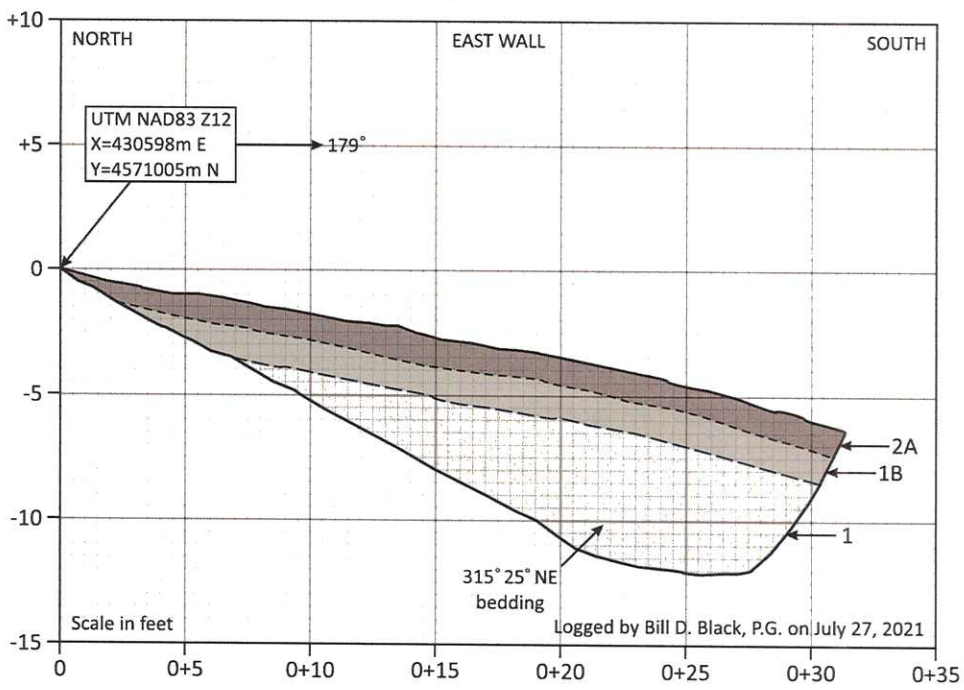
TEST PIT 1



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, yellowish-brown and brown; strong to very strong; well bedded; weathered tuffaceous sandstone; A and B soil horizons formed in unit (1A and 1B).

TEST PIT 2



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brown to white, strong to very strong, well bedded, weathered tuffaceous sandstone grading upward to light olive-brown, poorly bedded siltstone; B horizon formed in unit (1B).

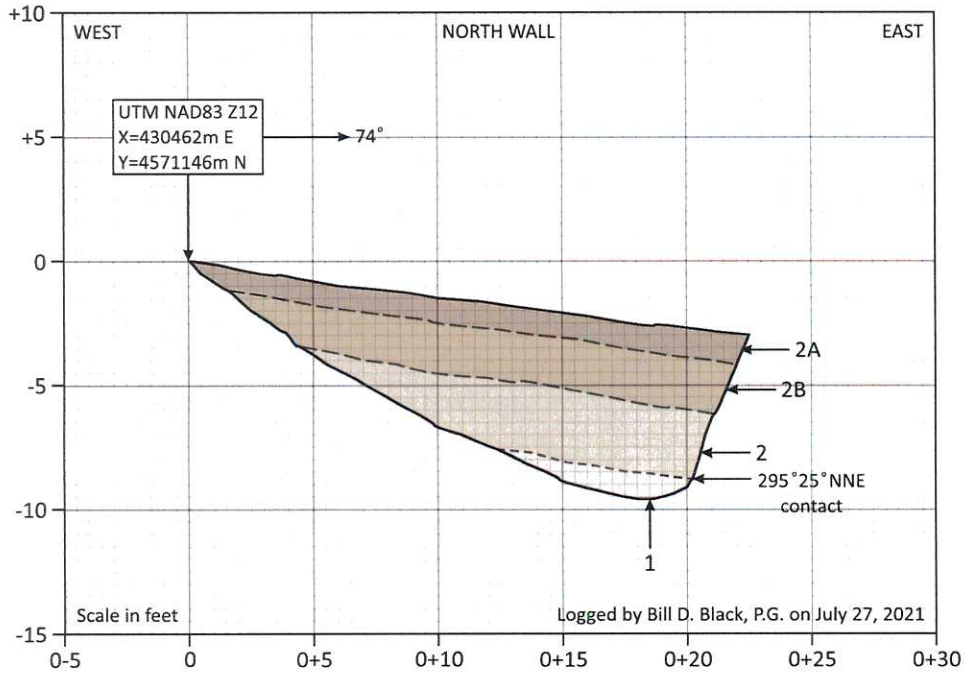
Unit 2. *Holocene mass wasting colluvium* - dark grayish-brown, medium dense to medium firm, massive, clayey sand to sandy clay (SC/CL) with gravel and cobbles; clasts subangular with stage II carbonate; soil A horizon formed in unit (2A); thickness about 1 feet.

TEST PIT LOGS, 1 AND 2

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3A

TEST PIT 3

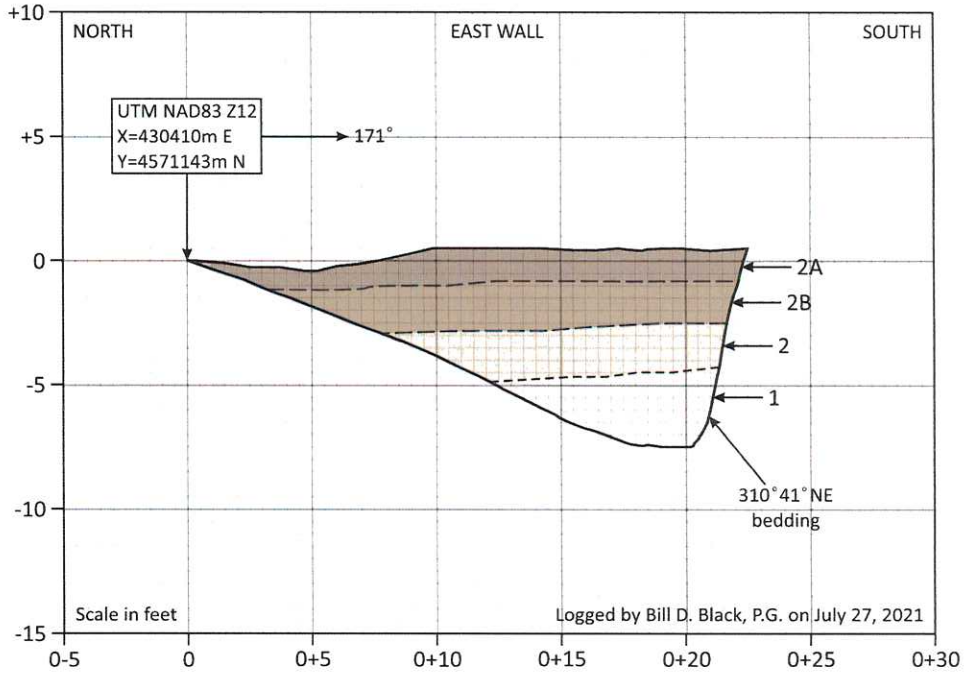


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange to olive-brown, strong, massive, weathered tuffaceous conglomerate.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark brown, dense to stiff, massive, clayey gravel to gravelly clay (GC/CL) with sand and trace cobbles; A and B horizons formed in unit (2A and 2B); about 6 feet thick.

TEST PIT 4



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brown to white, strong, well bedded, weathered siltstone.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, dense to stiff, massive, clayey gravel to gravelly clay (GC/CL) with cobbles along basal contact and near-surface cobbles and small boulders; clasts subangular with stage II carbonate; slight iron oxide staining along basal contact; A and B soil horizons formed in unit (2A and 2B); about 5 feet thick.

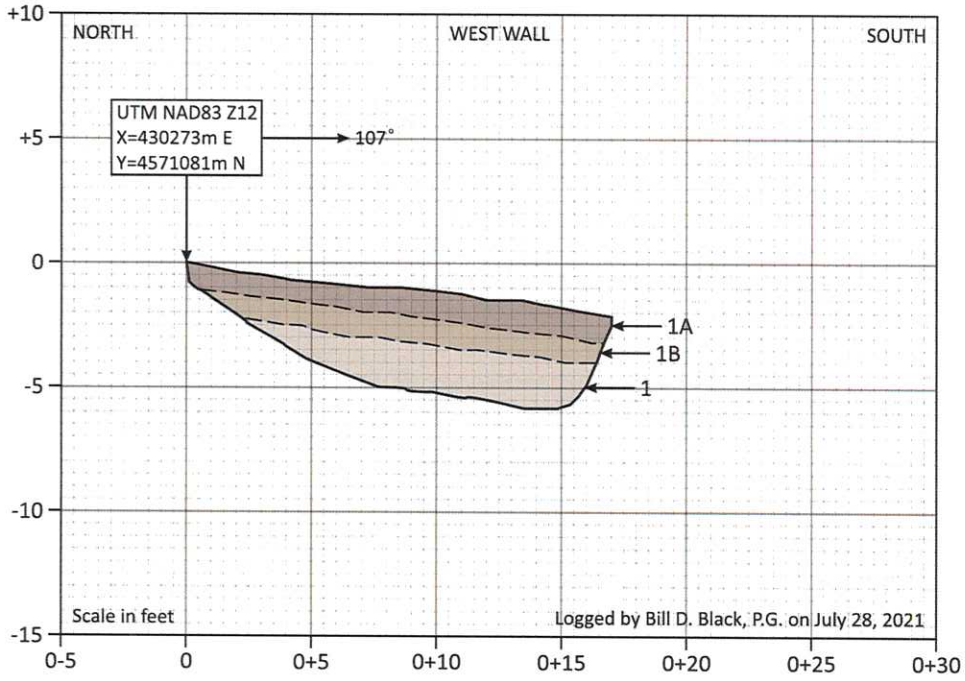
TEST PIT LOGS, 3 AND 4

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3B

WESTERN GEOLOGIC

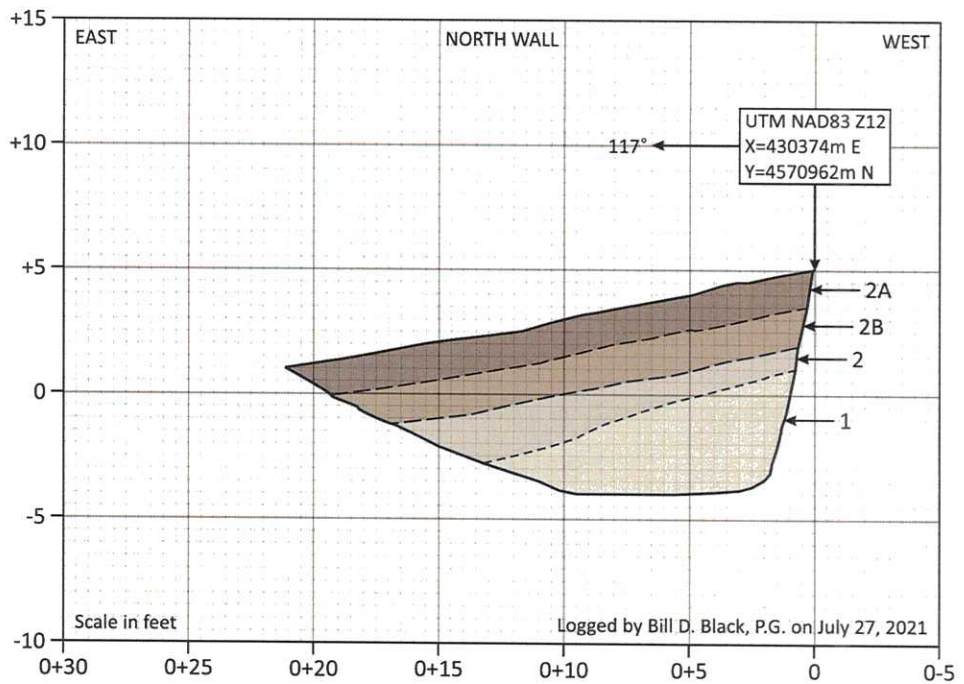
TEST PIT 5



UNIT DESCRIPTIONS

Unit 1. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, dense/stiff to very dense/stiff, massive, clayey gravel to gravelly clay (GC/CL); A and B soil horizons formed in unit (1A and 1B); thickness > 4 feet; refusal at test pit floor.

TEST PIT 6



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - grayish-brown to orange-brown, strong, massive, weathered tuffaceous conglomerate with round to subround cobbles.

Unit 2. *Late Pleistocene mass wasting colluvium* - olive-brown to dark grayish-brown, stiff to dense, massive, clay with gravel (CL) in basal part grading upward to clayey gravel (GC) with sand, cobbles and rare small boulders; clasts subangular to subround with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 4 to 5 feet thick.

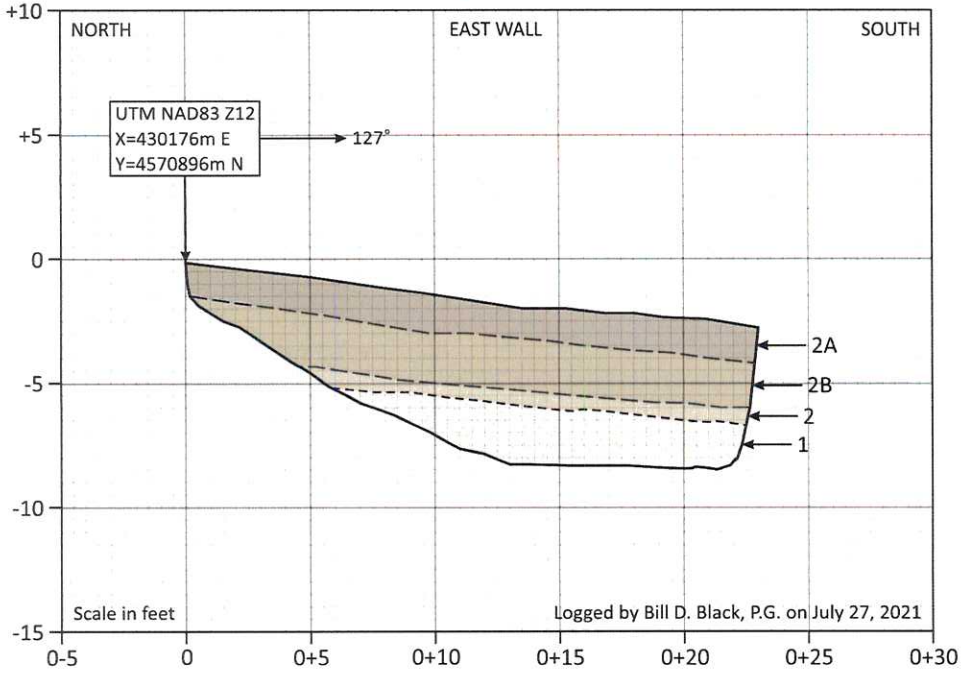
TEST PIT LOGS, 5 AND 6

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3C

WESTERN GEOLOGIC

TEST PIT 7

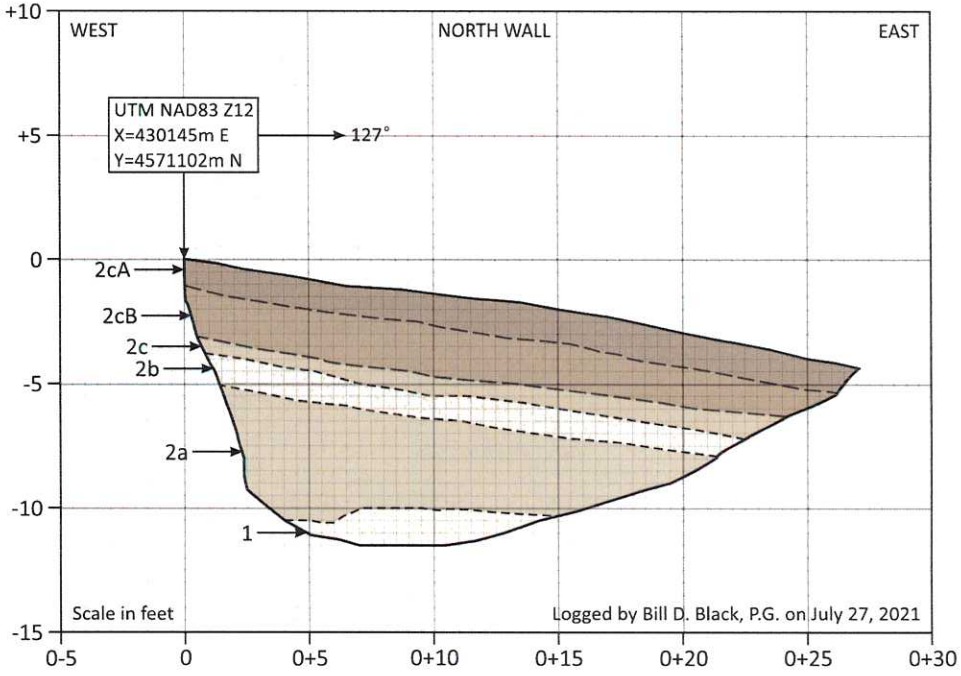


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brownish-olive, orange-brown and light brown; strong; poorly bedded; weathered claystone in upper part overlying weathered tuffaceous conglomerate with subangular to subround cobbles.

Unit 2. *Late Pleistocene mass wasting colluvium* - brownish-olive to dark grayish-brown, stiff, massive, lean clay (CL) with sand; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

TEST PIT 8



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light orange-brown, strong, massive, weathered tuffaceous conglomerate.

Unit 2. *Late Pleistocene mass wasting colluvium* - sequence of brown, brownish-gray, olive-brown and reddish-brown, stiff to dense, massive colluvium comprised of a lower (2a) lean clay (CL) with gravel; a middle (2b) gravelly clay to clayey gravel (CL/GC) with subangular cobbles; and an upper (2c) sandy clay (CL) with gravel and trace cobbles; A and B soil horizons formed in upper unit (2cA and 2cB); overall about 8.5 to 10 feet thick.

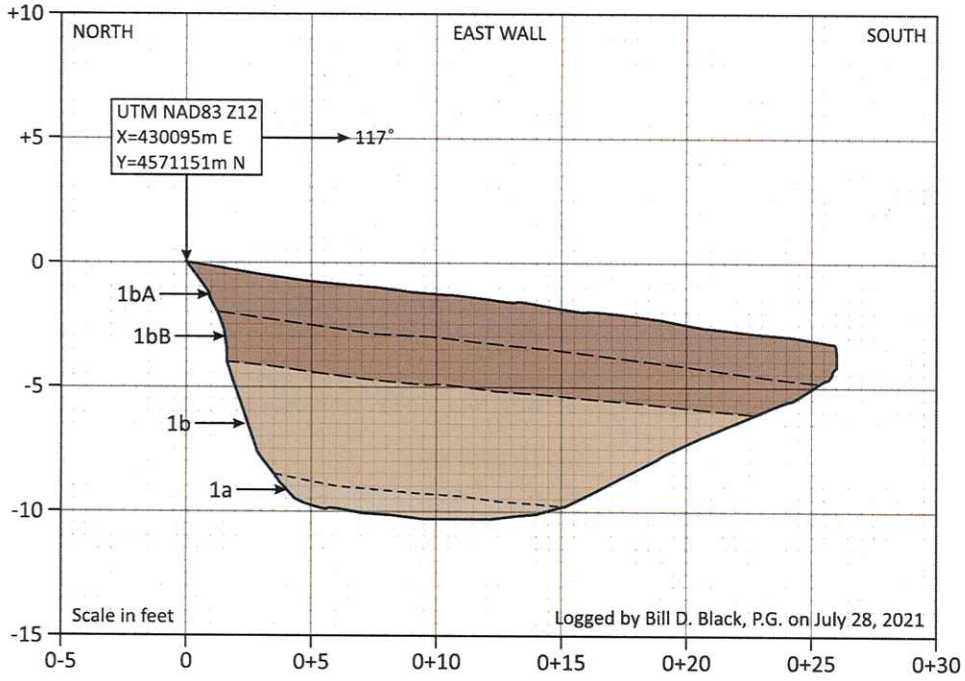
TEST PIT LOGS, 7 AND 8

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3D

WESTERN GEOLOGIC

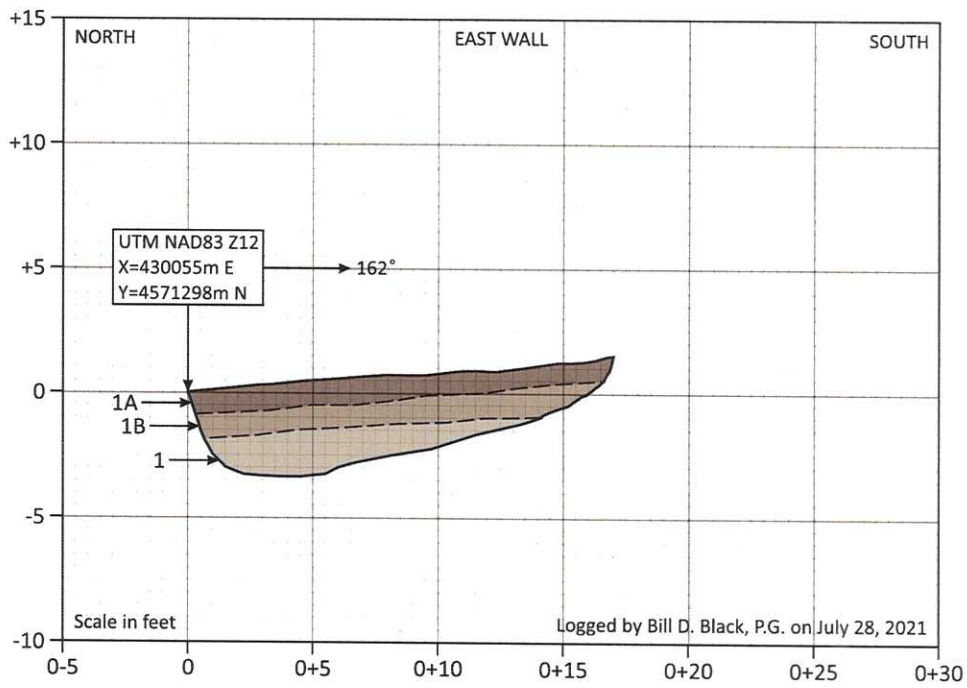
TEST PIT 9



UNIT DESCRIPTIONS

Unit 1. *Late Pleistocene mass wasting colluvium* - sequence comprised of a lower (1a) orange-brown, dense to stiff, massive, clayey gravel to gravelly clay (GC/CL); and an upper (1b) brown to dark grayish-brown, stiff, massive, clay (CL) with sand and gravel; A and B soil horizons formed in unit (1bA and 1bB); thickness > 9 feet.

TEST PIT 10



UNIT DESCRIPTIONS

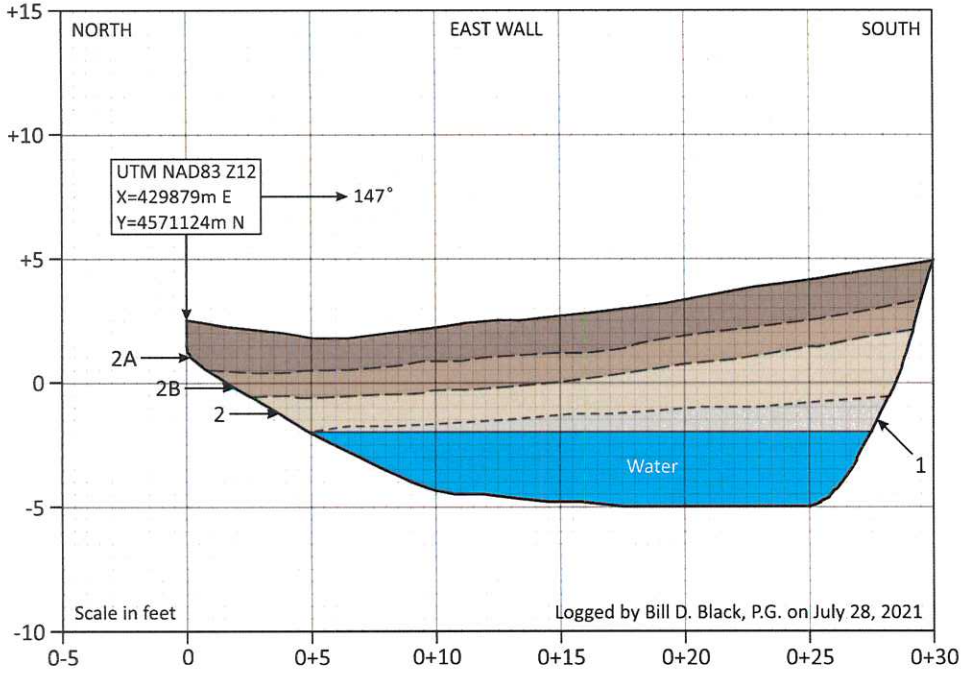
Unit 1. *Tertiary Norwood Formation* - orange-brown to dark grayish-brown, strong, massive, weathered tuffaceous conglomerate; A and B soil horizons formed in unit (1A and 1B); refusal at test pit floor.

TEST PIT LOGS, 9 AND 10

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3E

TEST PIT 11

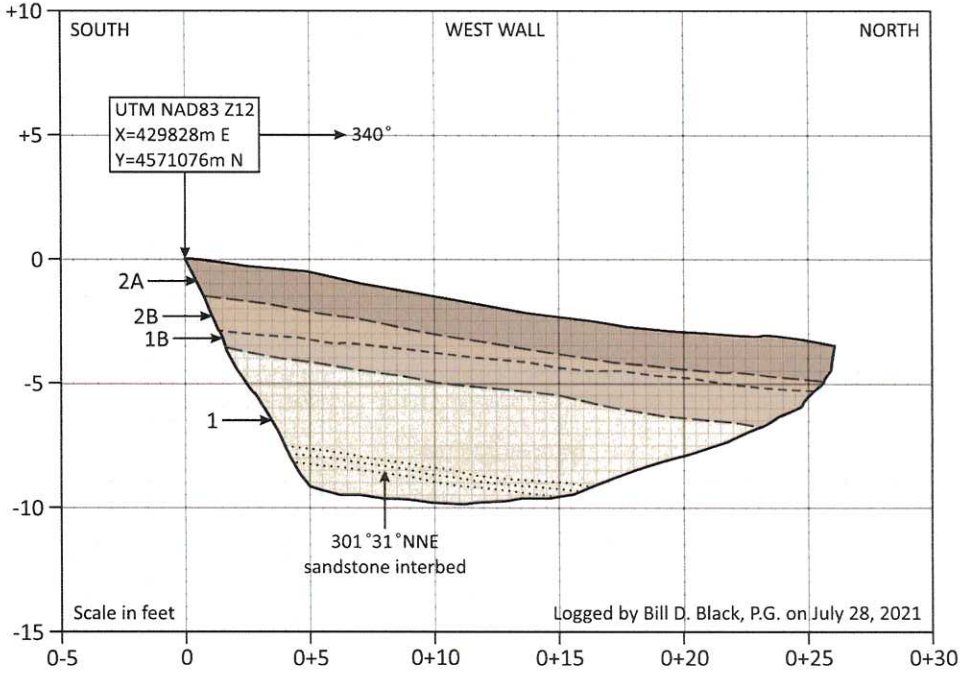


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - grayish-olive, dense, poorly bedded, strong, weathered tuffaceous sandstone; strike and dip not measured due to water.

Unit 2. *Late Pleistocene mass wasting colluvium* - orange-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 4 to 5 feet thick.

TEST PIT 12



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, strong, poorly to well bedded, weathered claystone with iron oxide staining along bedding and sandstone interbeds up to 12 inches thick; B horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - orange-brown to dark grayish-brown, dense, massive, clayey gravel (GC) with basal subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 2 to 3 feet thick.

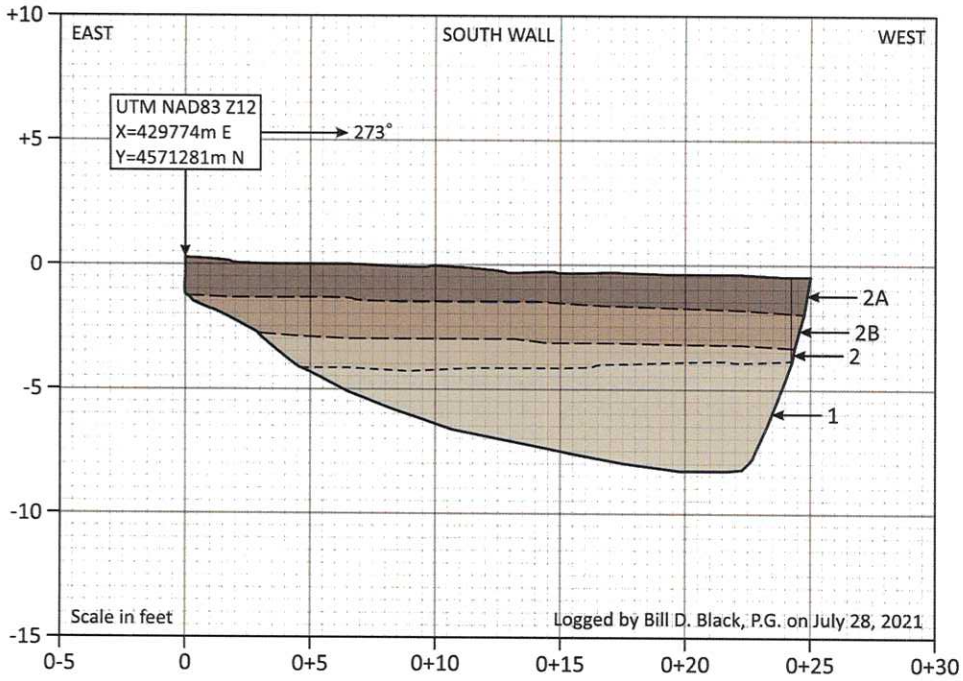
TEST PIT LOGS, 11 AND 12

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3F

WESTERN GEOLOGIC

TEST PIT 13

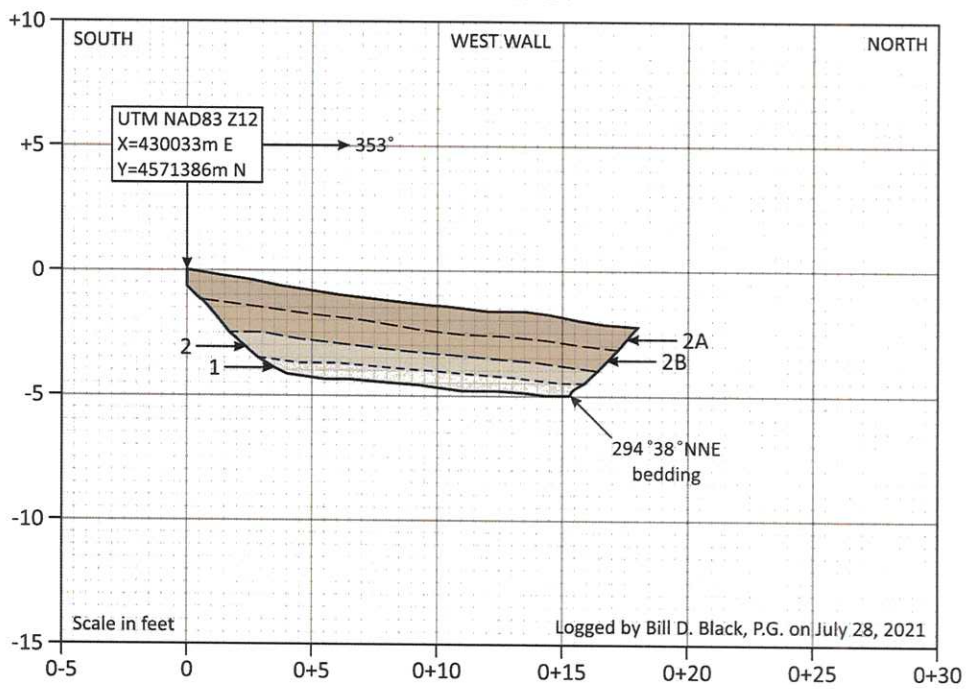


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light orange-brown to light grayish-brown, moderately strong, weathered tuffaceous conglomerate; clasts subangular with stage II carbonate, carbonate stringers in lower part of unit.

Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and near-surface subangular to subround cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 3.5 to 4 feet thick.

TEST PIT 14



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brownish-olive, strong to very strong, well bedded, laminated, weathered tuffaceous sandstone.

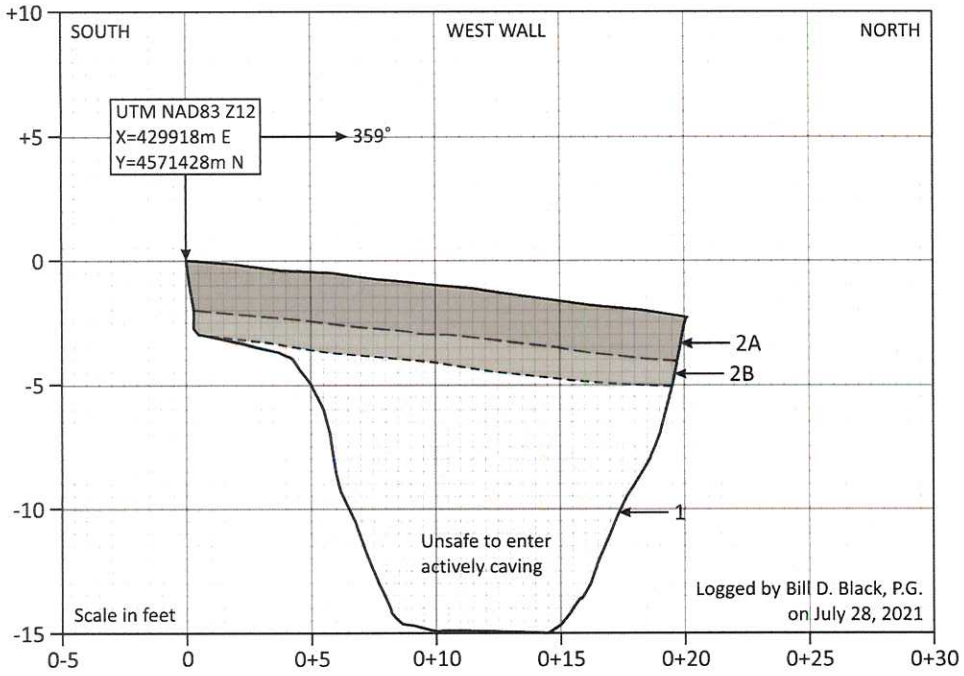
Unit 2. *Late Pleistocene mass wasting colluvium* - reddish-brown to dark grayish-brown, dense, massive, clayey gravel (GC) with sand and cobbles; clasts subangular to subround with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

TEST PIT LOGS, 13 AND 14

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3G

TEST PIT 15

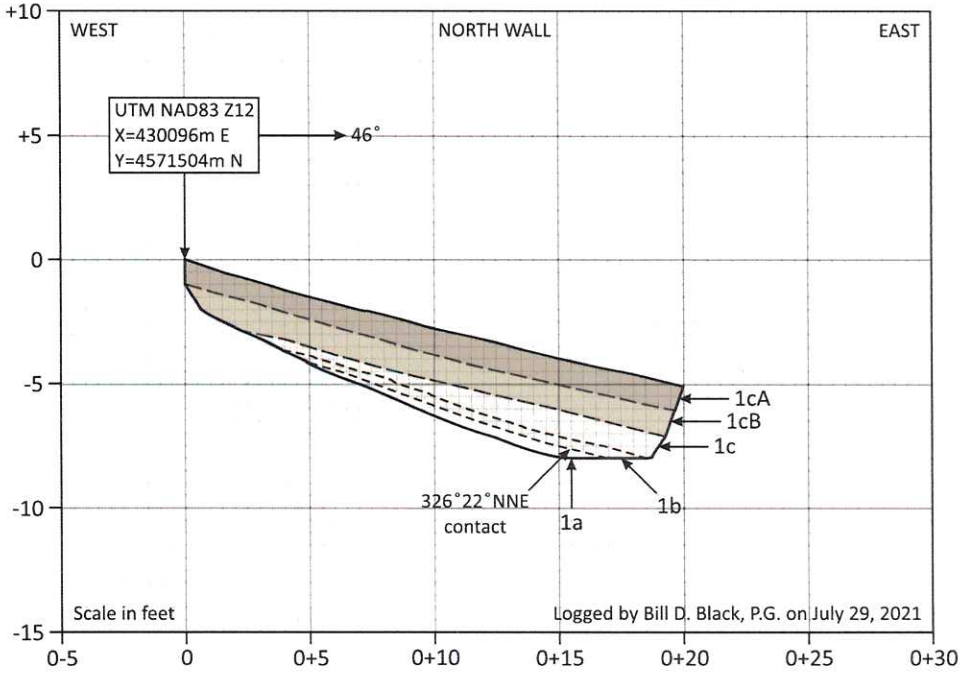


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation?* - light olive-brown to light grayish-olive, weak, highly fractured and weathered, poorly bedded, weathered claystone with brown banding.

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown to dark brownish-olive, stiff, massive, clay (CL) with sand, trace gravel and rare subangular to subround cobbles; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

TEST PIT 16



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of interbedded, olive-brown to light brown, strong, well bedded, weathered bedrock comprised of a lower (1a) claystone, a middle (1b) tuffaceous sandstone, and an upper (1c) siltstone to claystone; A and B soil horizons formed in upper unit (1cA and 1cB).

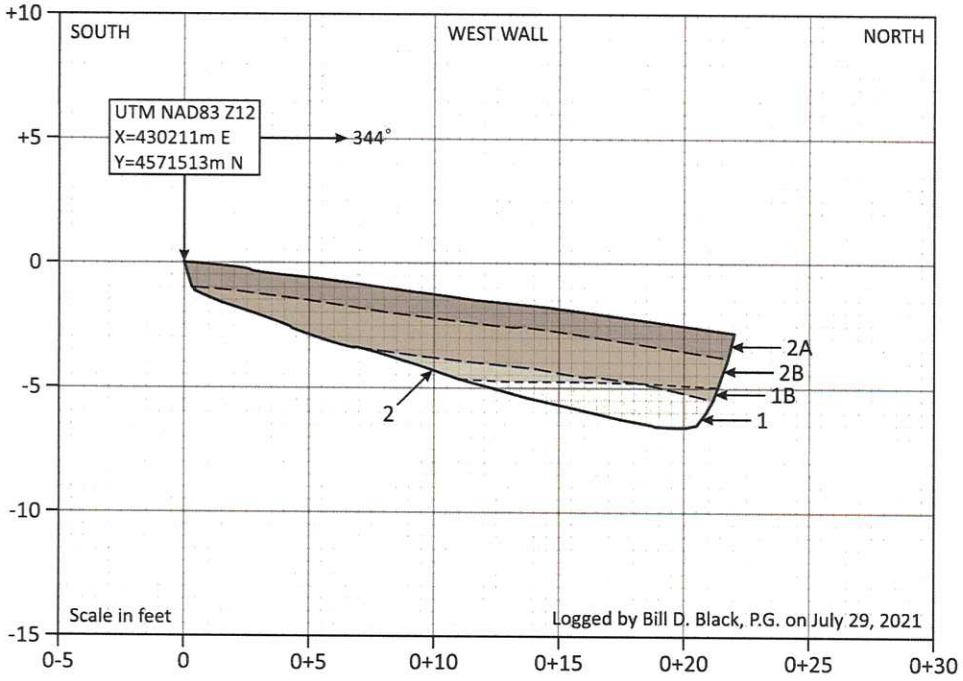
TEST PIT LOGS, 15 AND 16

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3H

WESTERN GEOLOGIC

TEST PIT 17

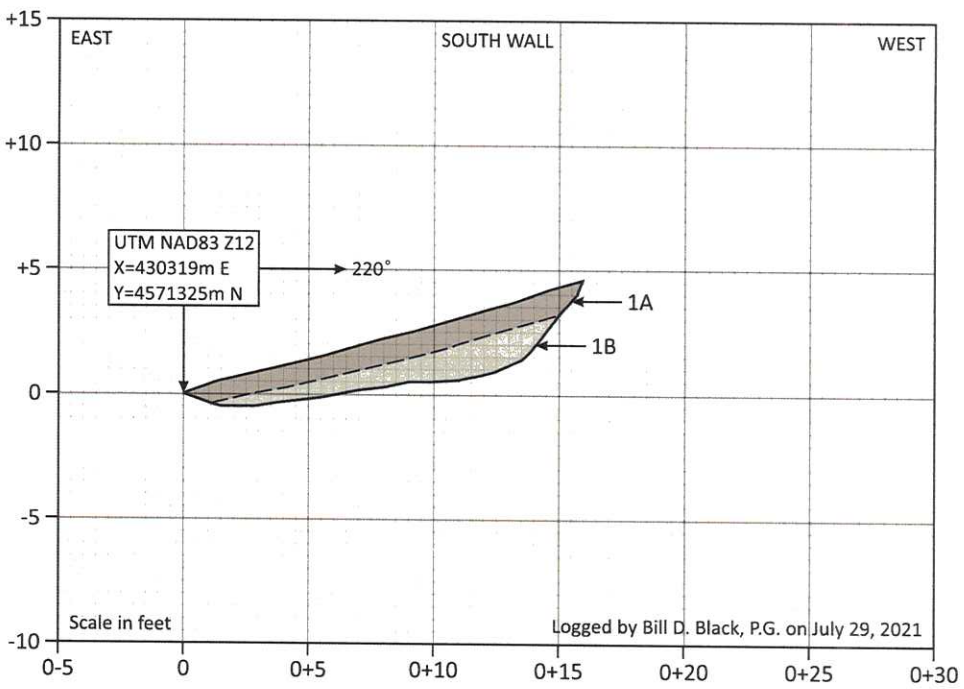


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, strong, massive, weathered claystone; B soil horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - olive-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand; A and B soil horizons formed in unit (2A and 2B); about 2.5 to 3.5 feet thick.

TEST PIT 18



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brownish-white, very strong, well bedded, tuffaceous sandstone; refusal at test pit floor; exposure too shallow to observe base of B horizon or measure strike/dip; A and B soil horizons formed in unit (1A and 1B).

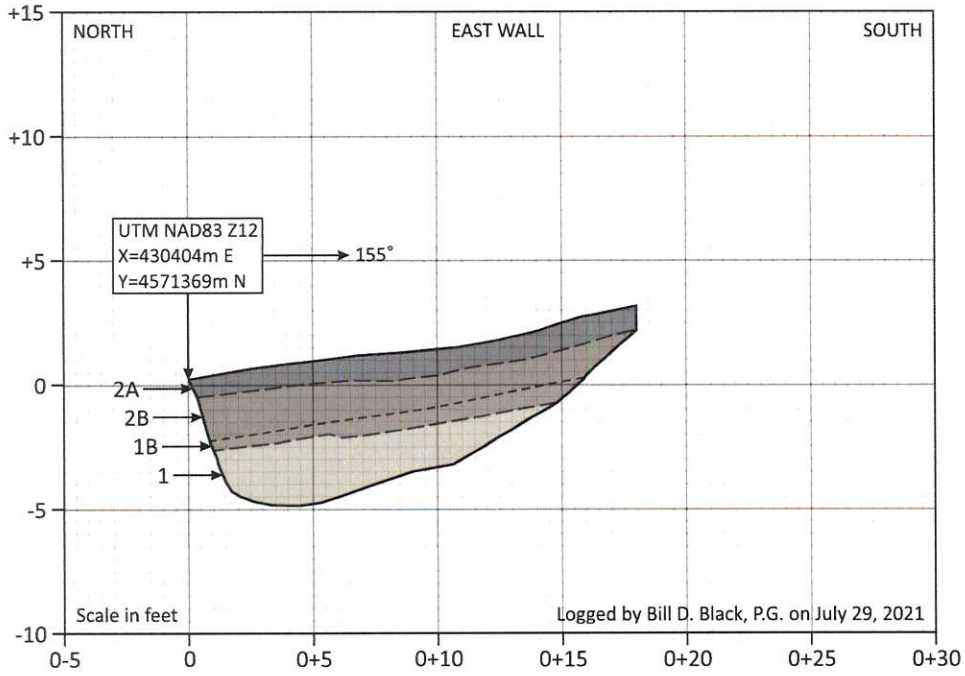
WESTERN GEOLOGIC

TEST PIT LOGS, 17 AND 18

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3I

TEST PIT 19

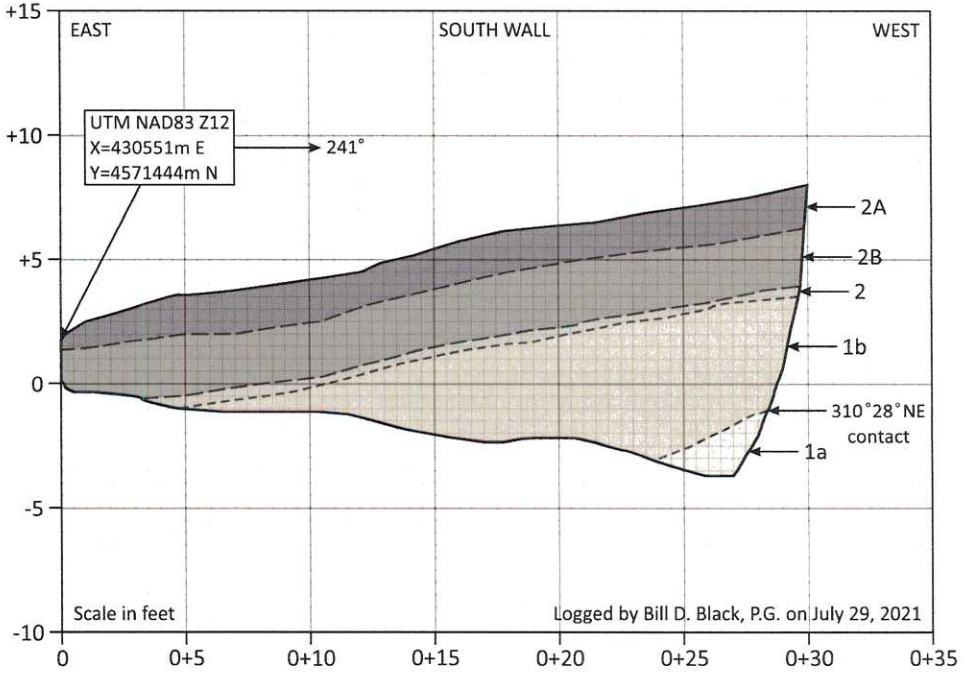


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, strong, massive, weathered claystone; B soil horizon formed in unit (1B).

Unit 2. *Late Pleistocene mass wasting colluvium* - olive-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

TEST PIT 20



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence of weathered bedrock comprised of a lower (1a) light grayish-olive, moderately strong, poorly bedded, siltstone to tuffaceous sandstone with carbonate; and an upper (1b) brownish-olive, strong, poorly bedded, claystone to tuffaceous conglomerate.

Unit 2. *Late Pleistocene to Holocene mixed alluvium and colluvium* - dark brown to dark grayish-brown, massive, stiff, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

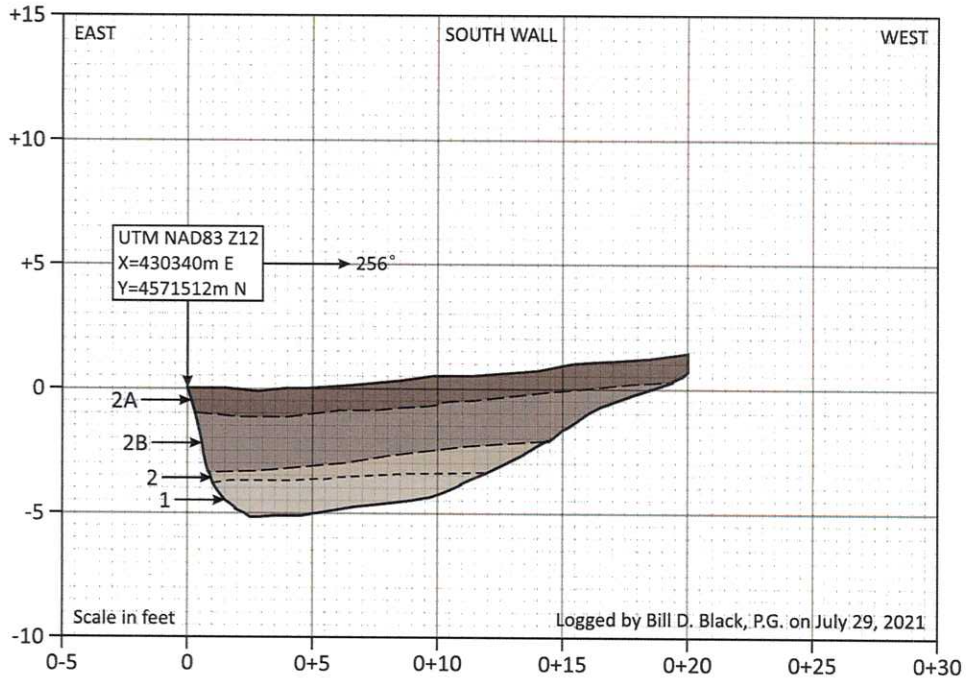
TEST PIT LOGS, 19 AND 20

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3J

WESTERN GEOLOGIC

TEST PIT 21

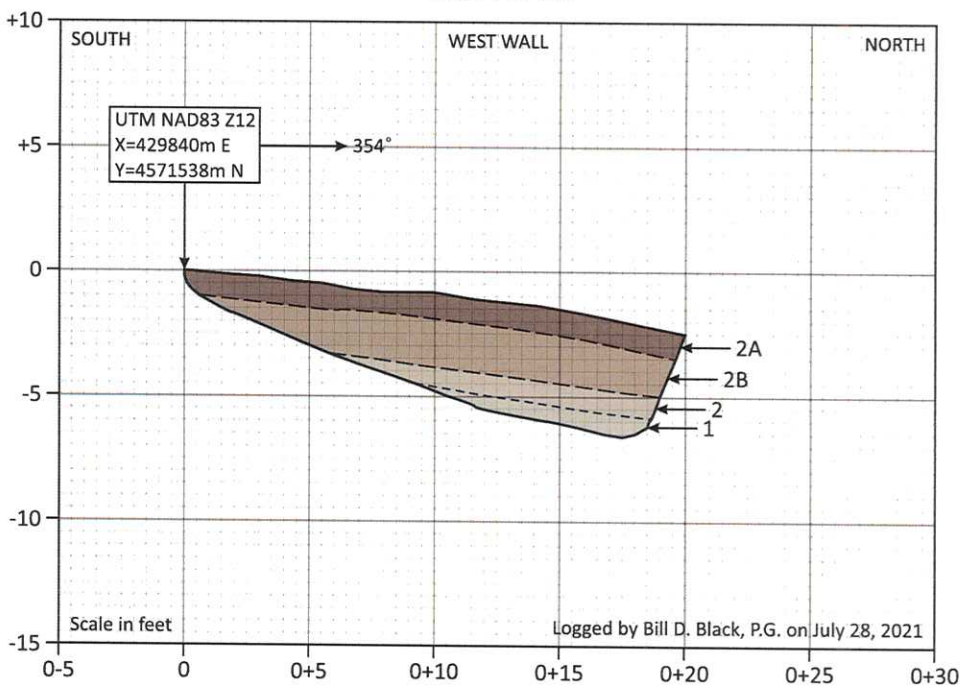


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown, strong, massive, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - olive-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

TEST PIT 22



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light olive-brown to light grayish-olive, moderately strong, poorly bedded, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, stiff, massive, clay (CL) with sand and subangular to subround cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

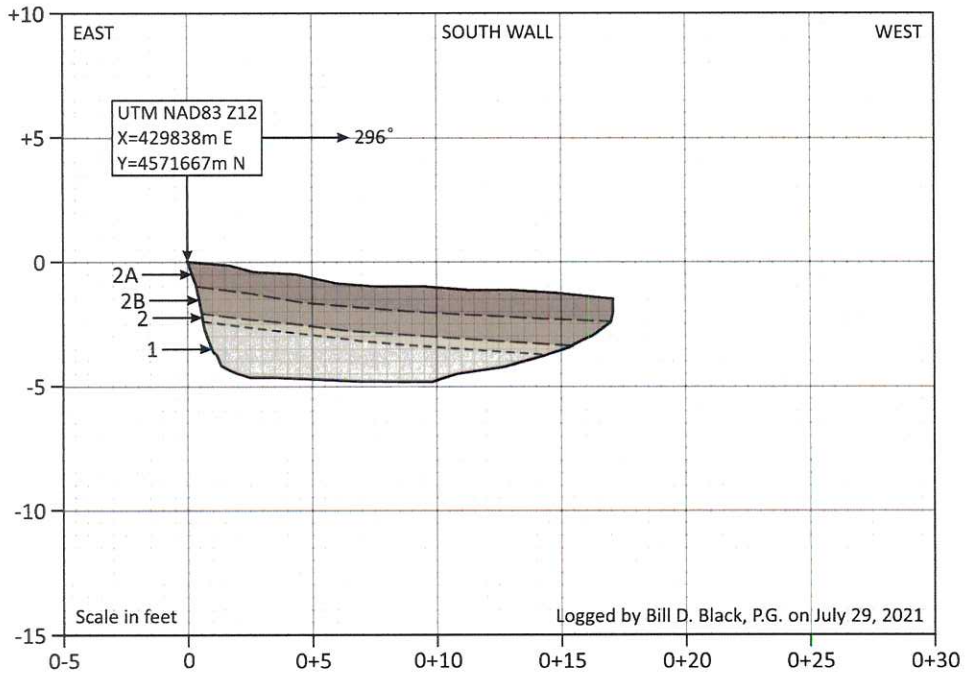
WESTERN GEOLOGIC

TEST PIT LOGS, 21 AND 22

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3K

TEST PIT 23

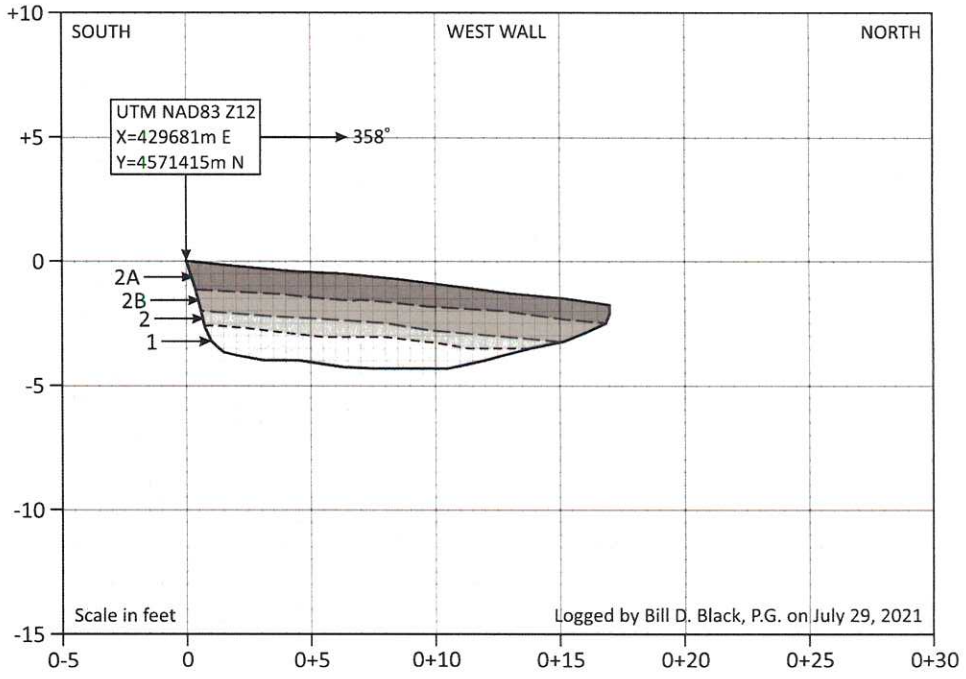


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light grayish-brown, moderately strong, poorly bedded, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - dark grayish-brown, medium stiff, massive, lean clay (CL) with trace sand; A and B soil horizons formed in unit (2A and 2B); about 2 feet thick.

TEST PIT 24



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light grayish-brown, moderately strong, poorly bedded, weathered claystone.

Unit 2. *Late Pleistocene to Holocene mixed alluvium and colluvium* - dark grayish-brown, medium stiff, massive, lean clay (CL) with trace sand; A and B soil horizons formed in unit (2A and 2B); about 2 to 3 feet thick.

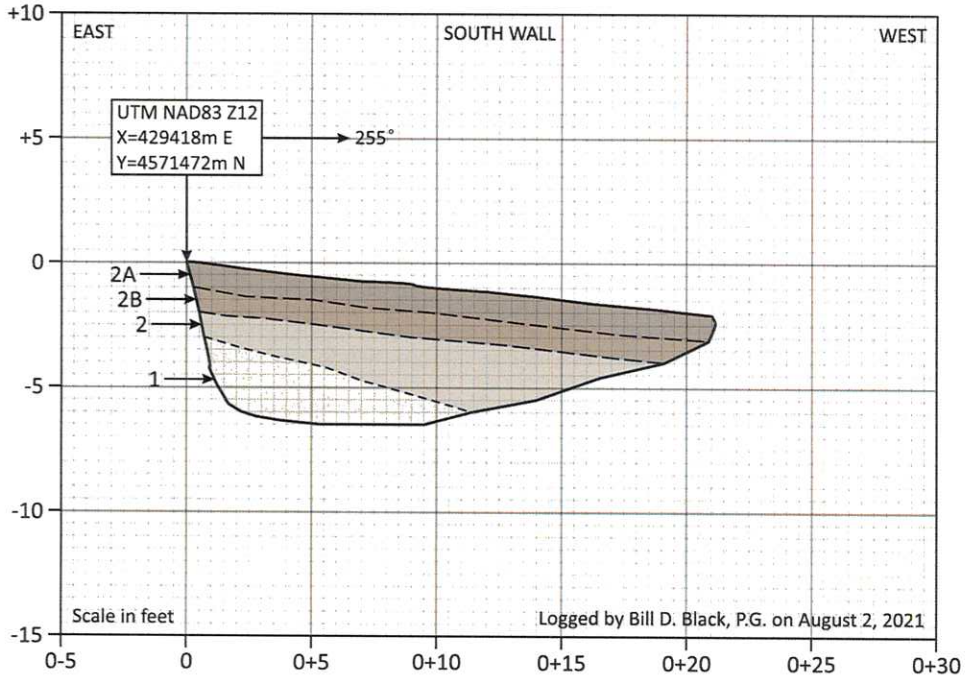
TEST PIT LOGS, 23 AND 24

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3L

WESTERN GEOLOGIC

TEST PIT 25

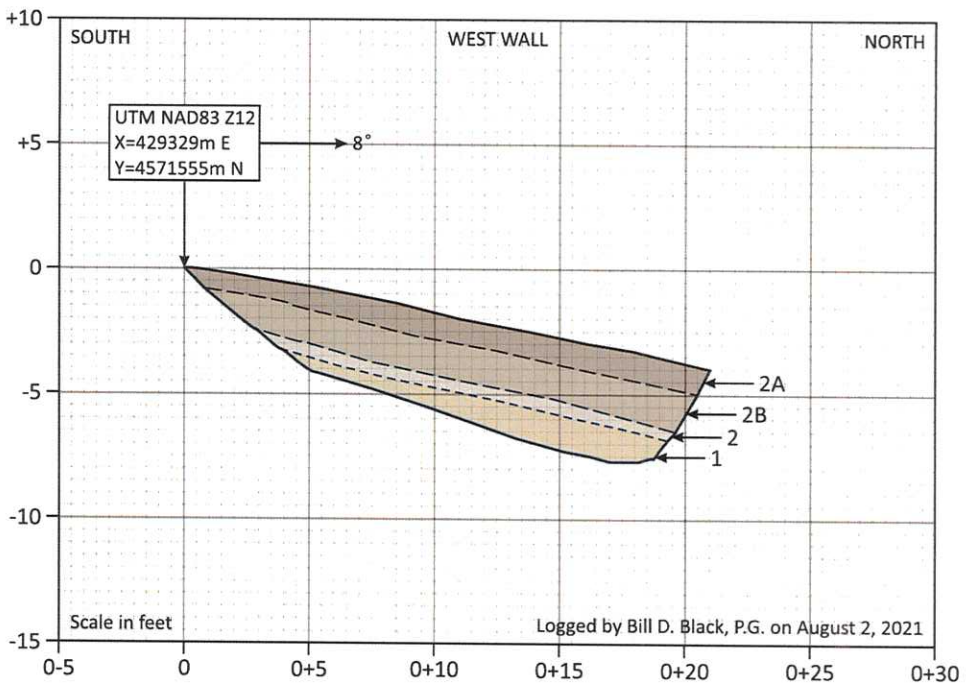


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light grayish-olive-brown, strong, poorly bedded, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and trace gravel; A and B soil horizons formed in unit (2A and 2B); about 3 to 5 feet thick.

TEST PIT 26



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange-brown, strong, massive, weathered pebble conglomerate.

Unit 2. *Late Pleistocene mass wasting colluvium* - light brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand and gravel; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

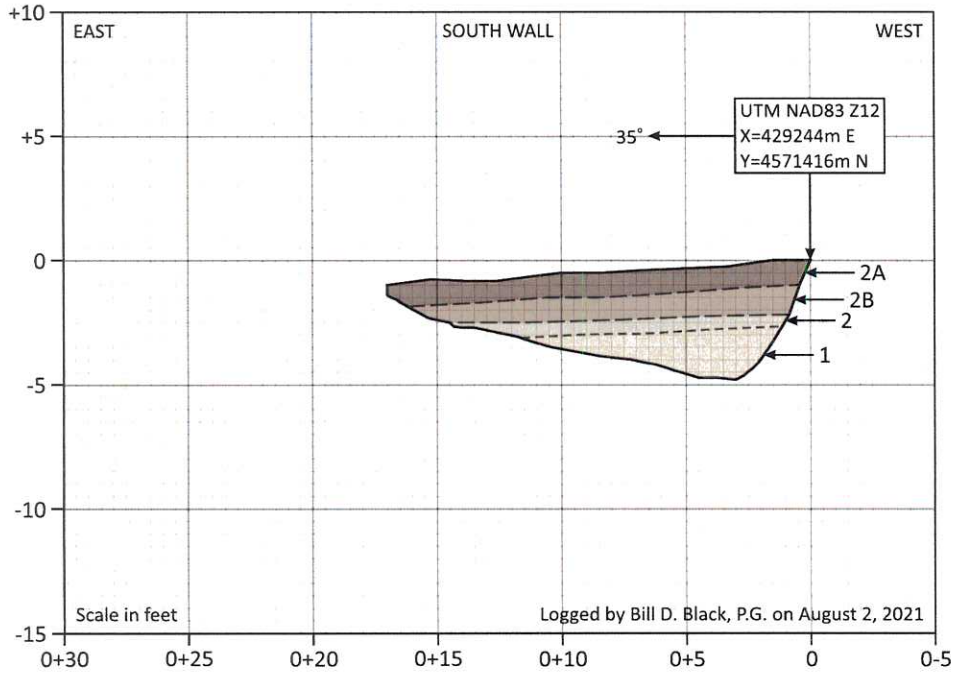
WESTERN GEOLOGIC

TEST PIT LOGS, 25 AND 26

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3M

TEST PIT 27

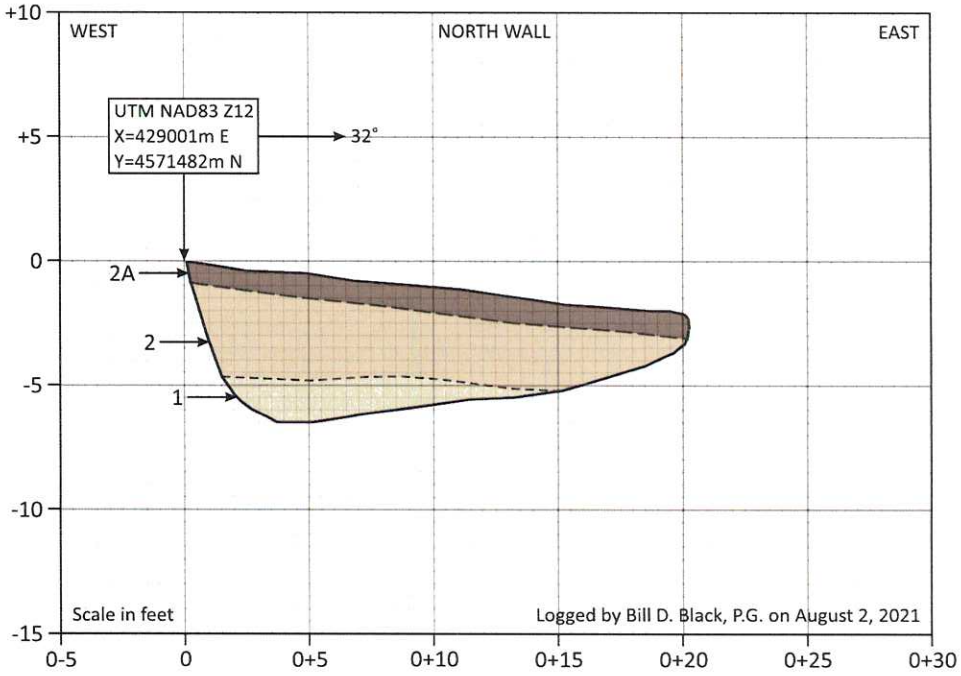


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - olive-brown, strong, poorly bedded, weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - dark brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand, gravel; and rare small subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 2.5 feet thick.

TEST PIT 28



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brown to olive-brown, strong, poorly bedded, weathered tuffaceous conglomerate with carbonate.

Unit 2. *Holocene mass wasting colluvium* - brown to dark grayish-brown, medium dense, massive, clayey gravel (GC) with sand and subangular to subround cobbles with stage II carbonate; A soil horizon formed in unit (2A); about 3.5 to 4.5 feet thick.

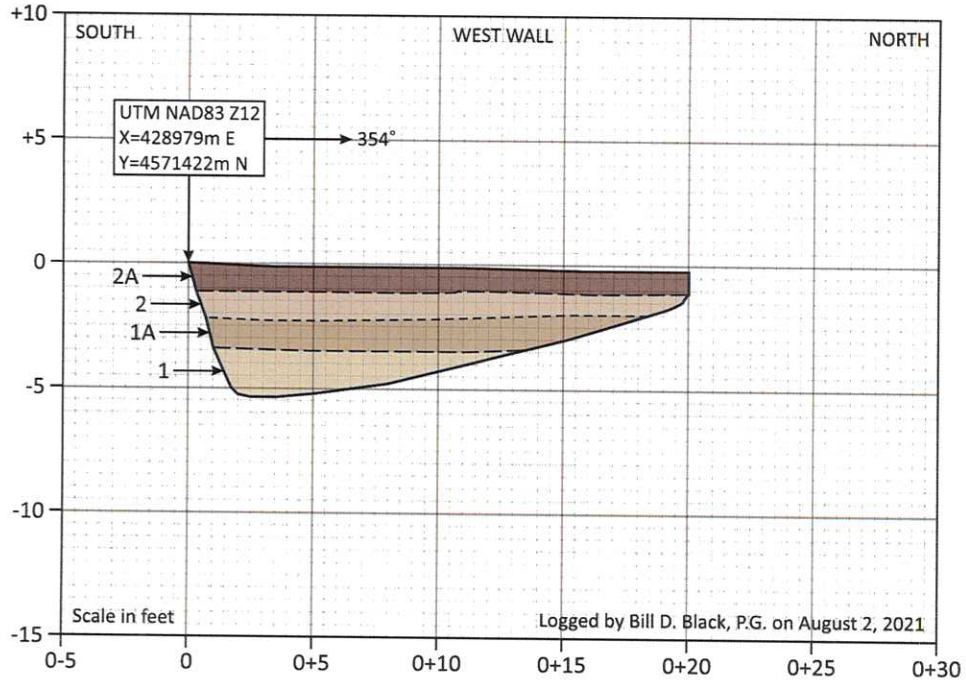
TEST PIT LOGS, 27 AND 28

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3N

WESTERN GEOLOGIC

TEST PIT 29

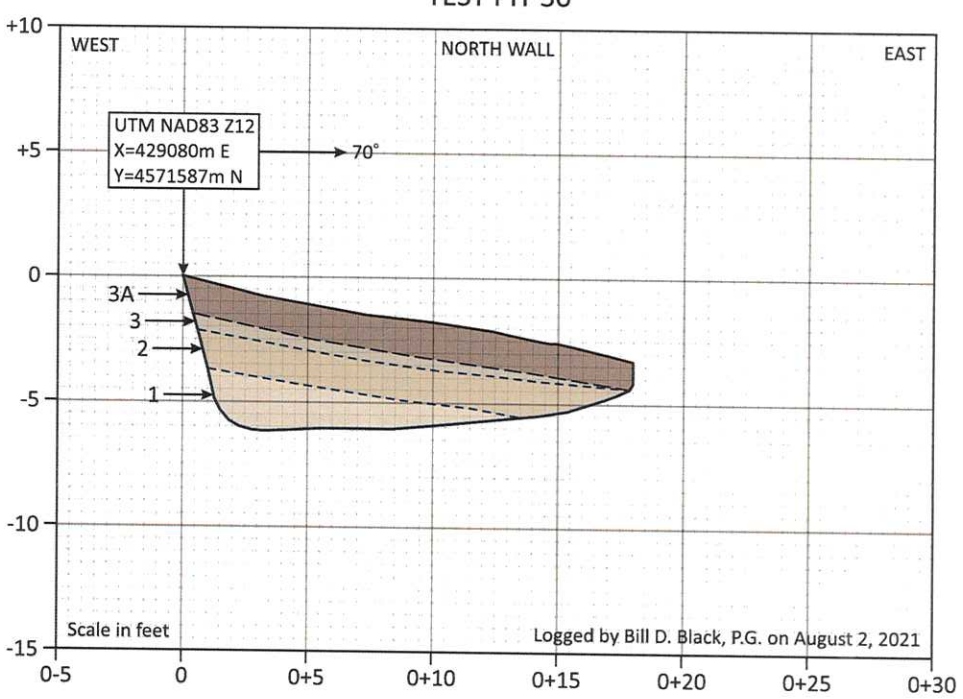


UNIT DESCRIPTIONS

Unit 1. *Holocene mass wasting colluvium* - grayish-brown to orange-brown, medium dense to dense, poorly bedded to massive, clayey gravel (GC) with sand, subround to angular cobbles with stage II carbonate and discontinuous organic-rich lamina; paleosol A horizon formed in unit (1A); thickness > 3 feet.

Unit 2. *Holocene mass wasting colluvium* - grayish-brown to dark grayish-brown, medium dense to dense, massive, clayey gravel (GC) with sand; A soil horizon formed in unit (2A); about 2 feet thick.

TEST PIT 30



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown, strong, poorly bedded, weathered claystone with orange-brown lamina.

Unit 2. *Holocene mass wasting colluvium* - brown, medium dense, massive, clayey gravel (GC) with sand and angular cobbles with stage II carbonate; clasts slightly imbrecated; about 1.5 feet thick.

Unit 3. *Holocene mass wasting colluvium* - dark grayish-brown, dense to medium dense, massive, clayey gravel (GC); A soil horizon formed in unit (3A); about 2 feet thick.

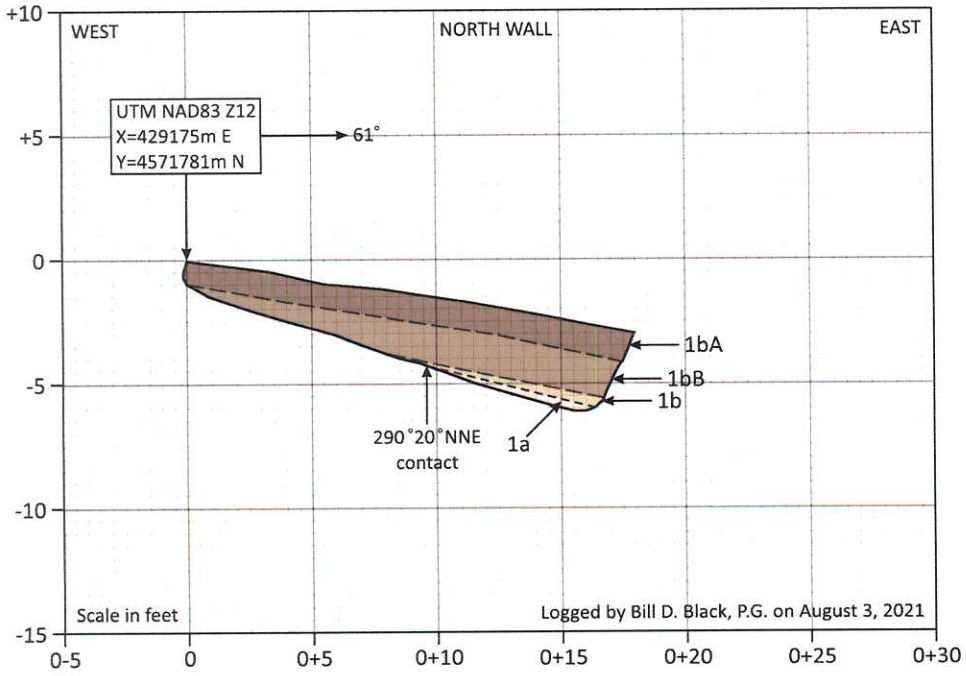
TEST PIT LOGS, 29 AND 30

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 30

WESTERN GEOLOGIC

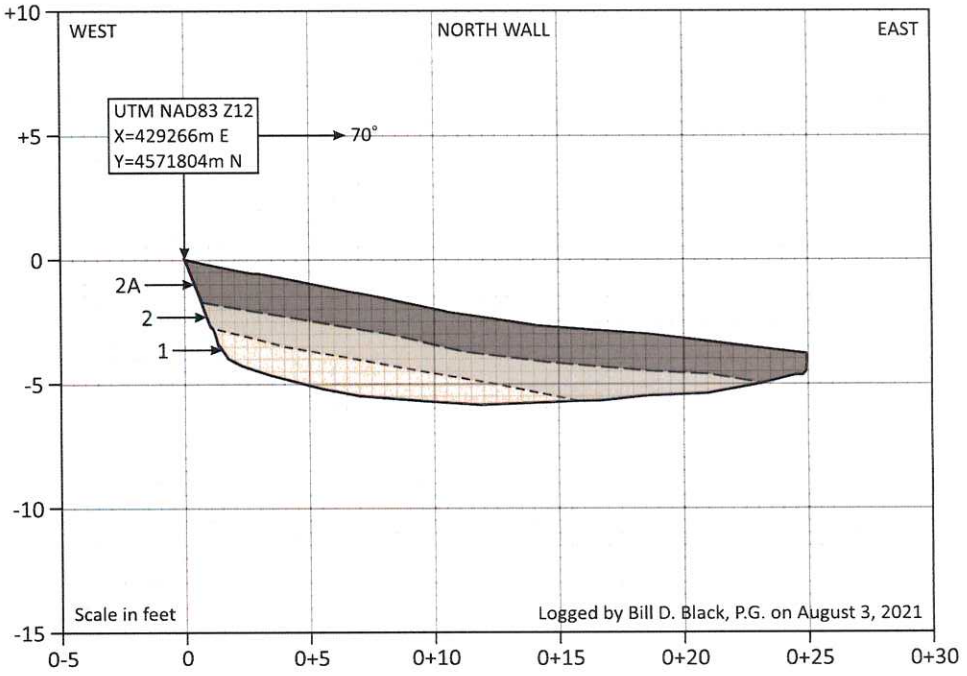
TEST PIT 31



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - sequence comprised of a lower (1a) light brown, strong to very strong, poorly bedded, weathered tuffaceous sandstone; and an upper (1b) light orange-brown to dark grayish-brown, moderately strong, poorly bedded to massive, weathered tuffaceous conglomerate; A and B soil horizons formed in unit (1bA and 1bB).

TEST PIT 32



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - orange to grayish-brown, strong, poorly bedded, weathered tuffaceous conglomerate.

Unit 2. *Late Pleistocene? mass wasting colluvium* - brown to dark grayish-brown, medium dense, massive, clayey gravel (GC) with sand; A soil horizon formed in unit (2A), B horizon indistinct; about 2.5 feet thick.

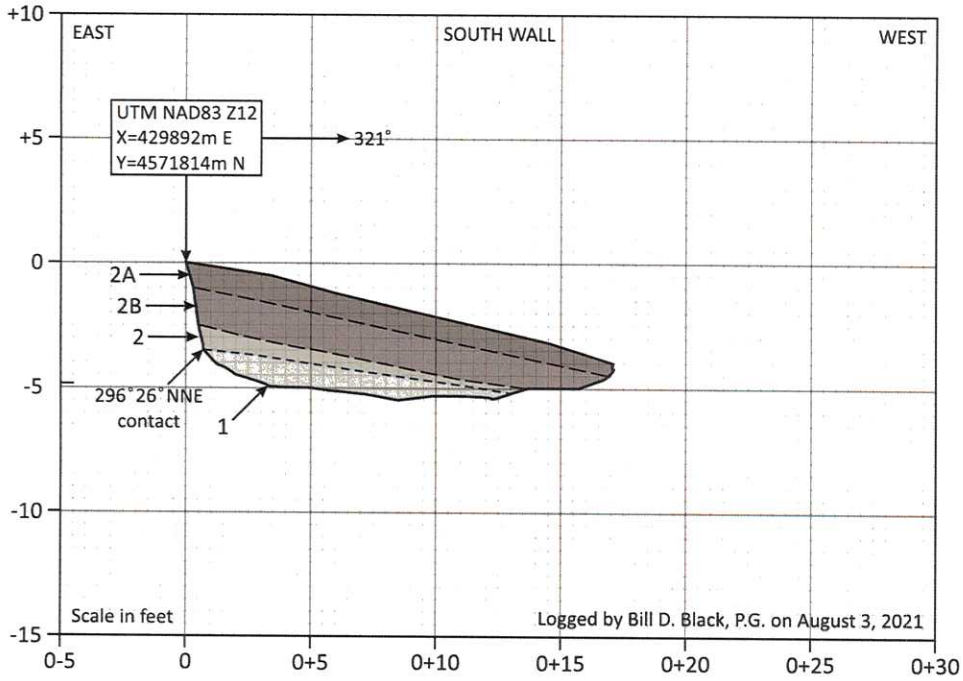
TEST PIT LOGS, 31 AND 32

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3P

WESTERN GEOLOGIC

TEST PIT 33

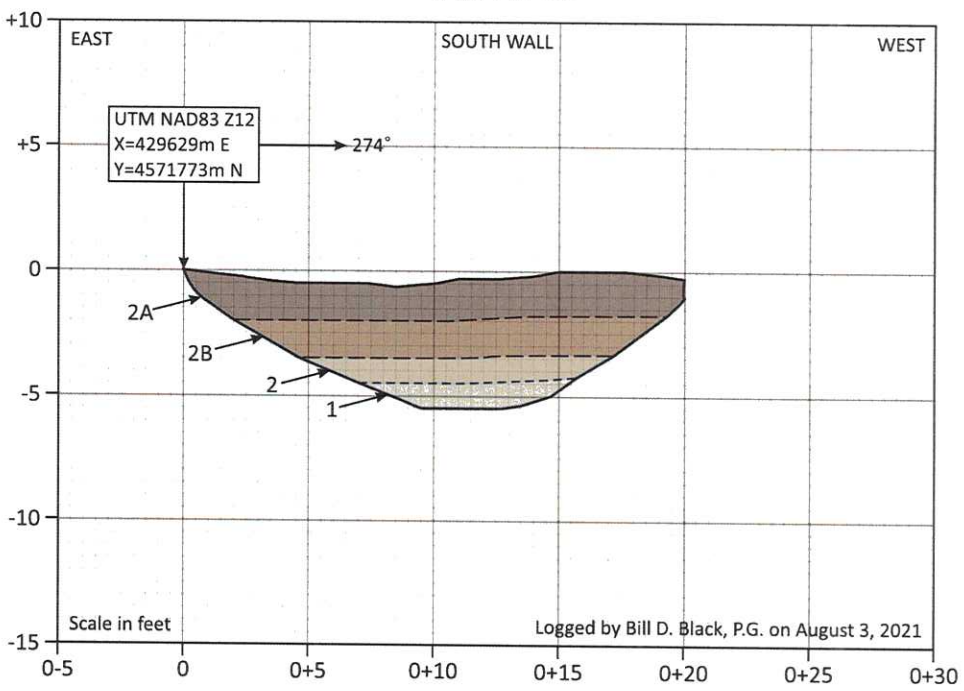


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - light brownish-gray, strong, well bedded weathered claystone.

Unit 2. *Late Pleistocene mass wasting colluvium* - grayish-brown to dark grayish-brown, stiff, massive, lean clay (CL) with sand, gravel and trace subangular cobbles with stage II carbonate; A and B soil horizons formed in unit (2A and 2B); about 3 feet thick.

TEST PIT 34



UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown to light brown, strong, massive, weathered tuffaceous conglomerate.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, stiff to medium stiff, sandy to gravelly clay (CL) with trace cobbles; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

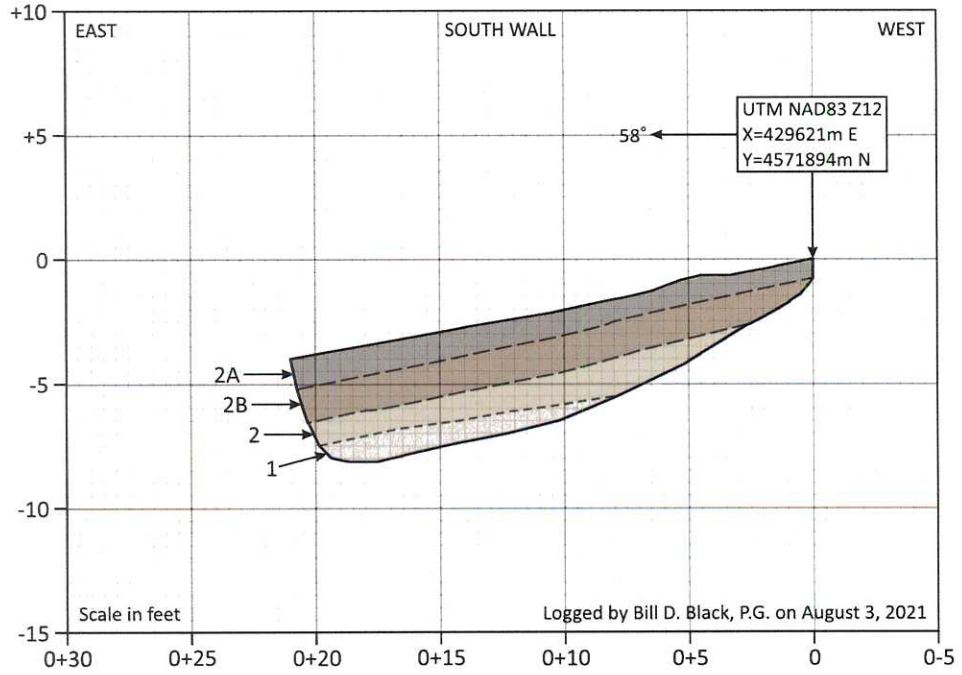
WESTERN GEOLOGIC

TEST PIT LOGS, 33 AND 34

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3Q

TEST PIT 35

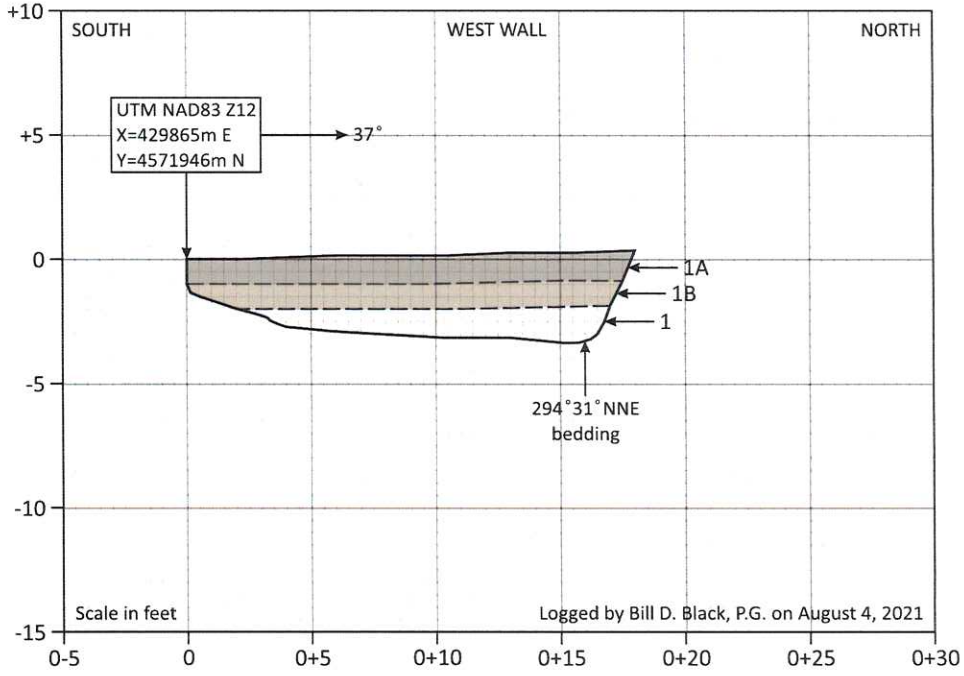


UNIT DESCRIPTIONS

Unit 1. *Tertiary Norwood Formation* - brown to light brown, strong, massive, weathered tuffaceous conglomerate.

Unit 2. *Late Pleistocene mass wasting colluvium* - brown to dark grayish-brown, stiff to medium stiff, sandy to gravelly clay (CL) with trace cobbles; A and B soil horizons formed in unit (2A and 2B); about 4 feet thick.

TEST PIT 36



UNIT DESCRIPTIONS

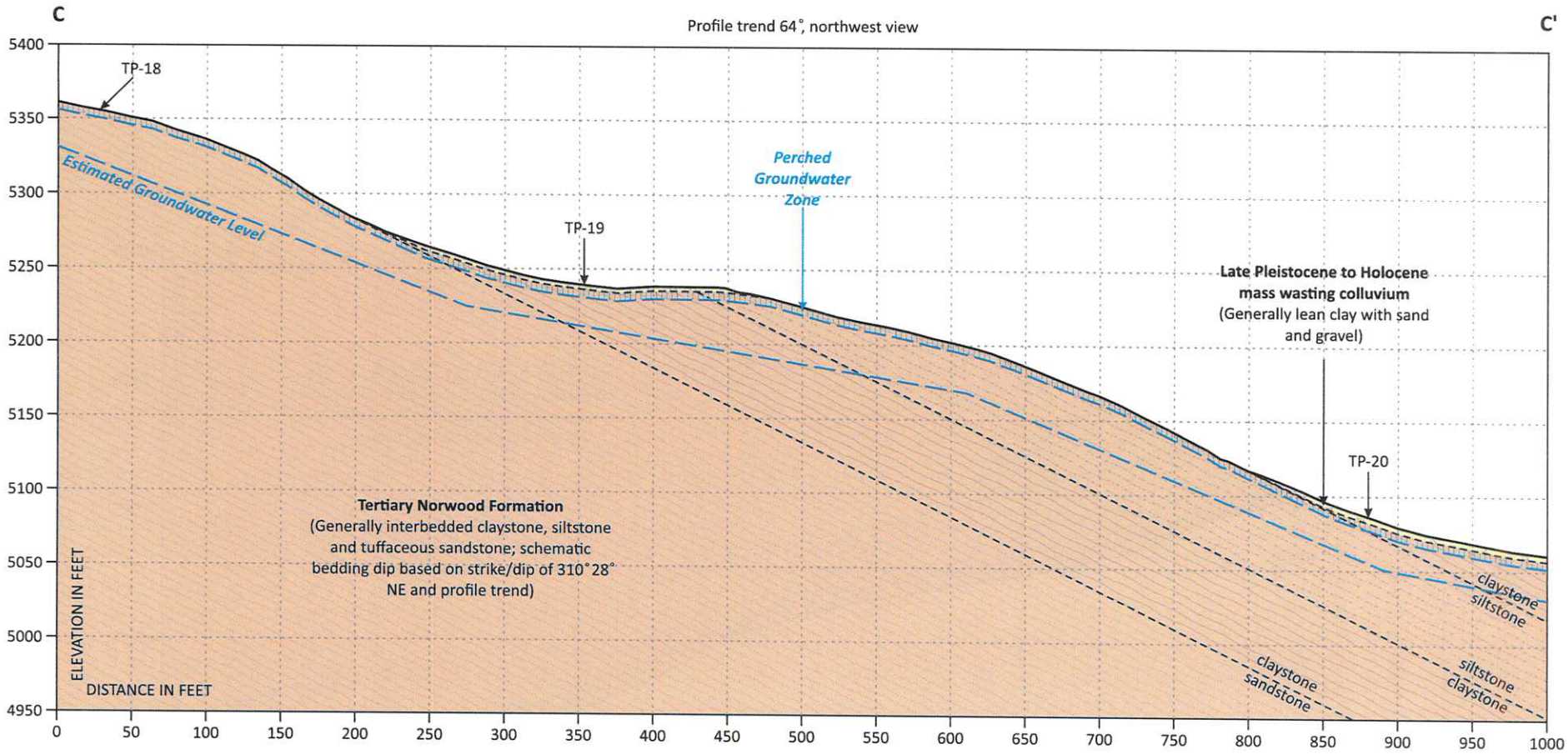
Unit 1. *Tertiary Norwood Formation* - light gray, strong to very strong, poorly bedded, weathered tuffaceous sandstone with iron-oxide staining along fractures; A and B soil horizons formed in unit (1A and 1B); refusal at test pit floor.

TEST PIT LOGS, 35 AND 36

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 3R

WESTERN GEOLOGIC



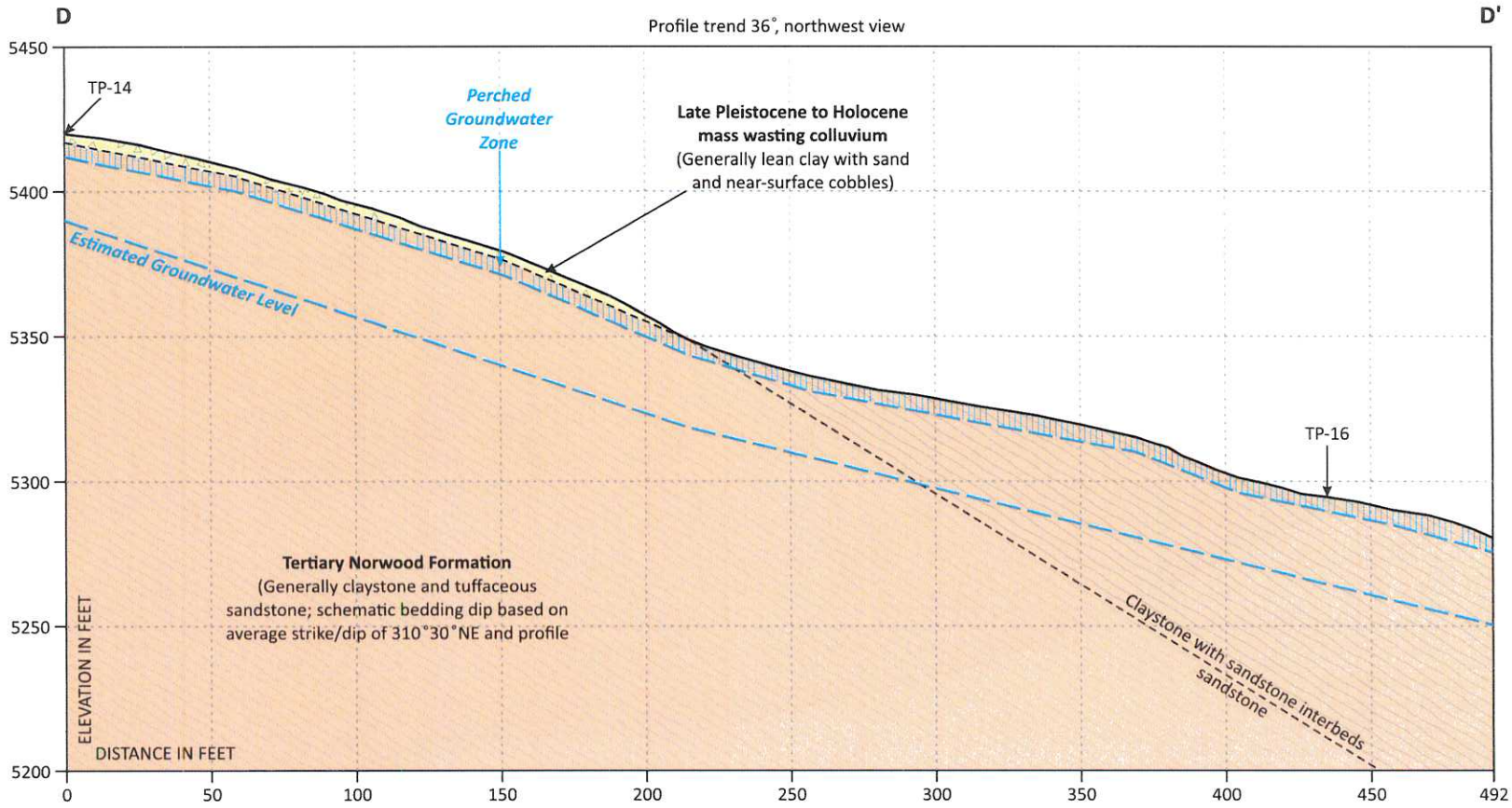
GEOLOGIC CROSS SECTION C-C'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5C

WESTERN GEOLOGIC

Scale 1 inch equals 70 feet (1:840) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

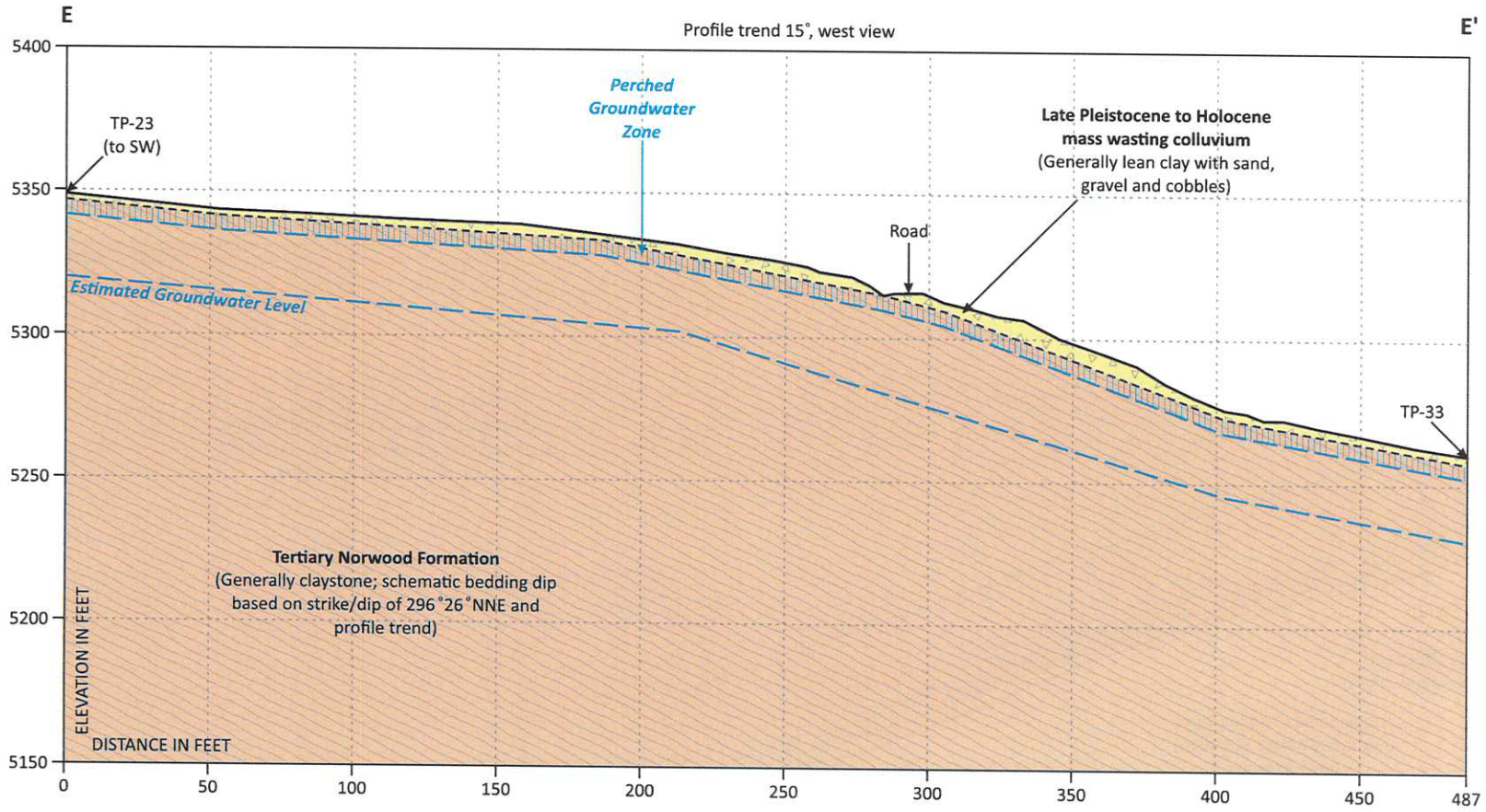


GEOLOGIC CROSS SECTION D-D'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5D

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



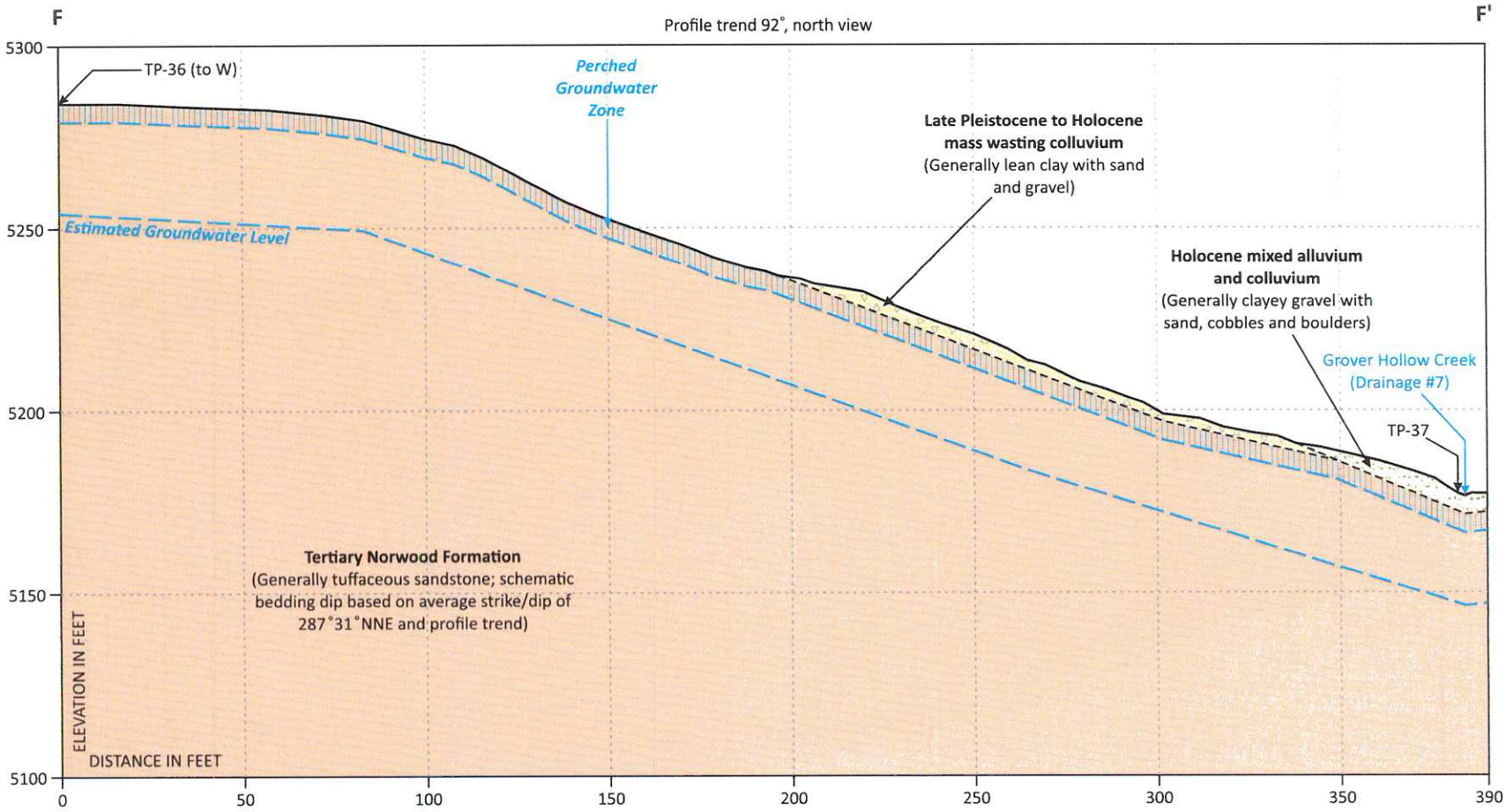
GEOLOGIC CROSS SECTION E-E'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5E

WESTERN GEOLOGIC

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



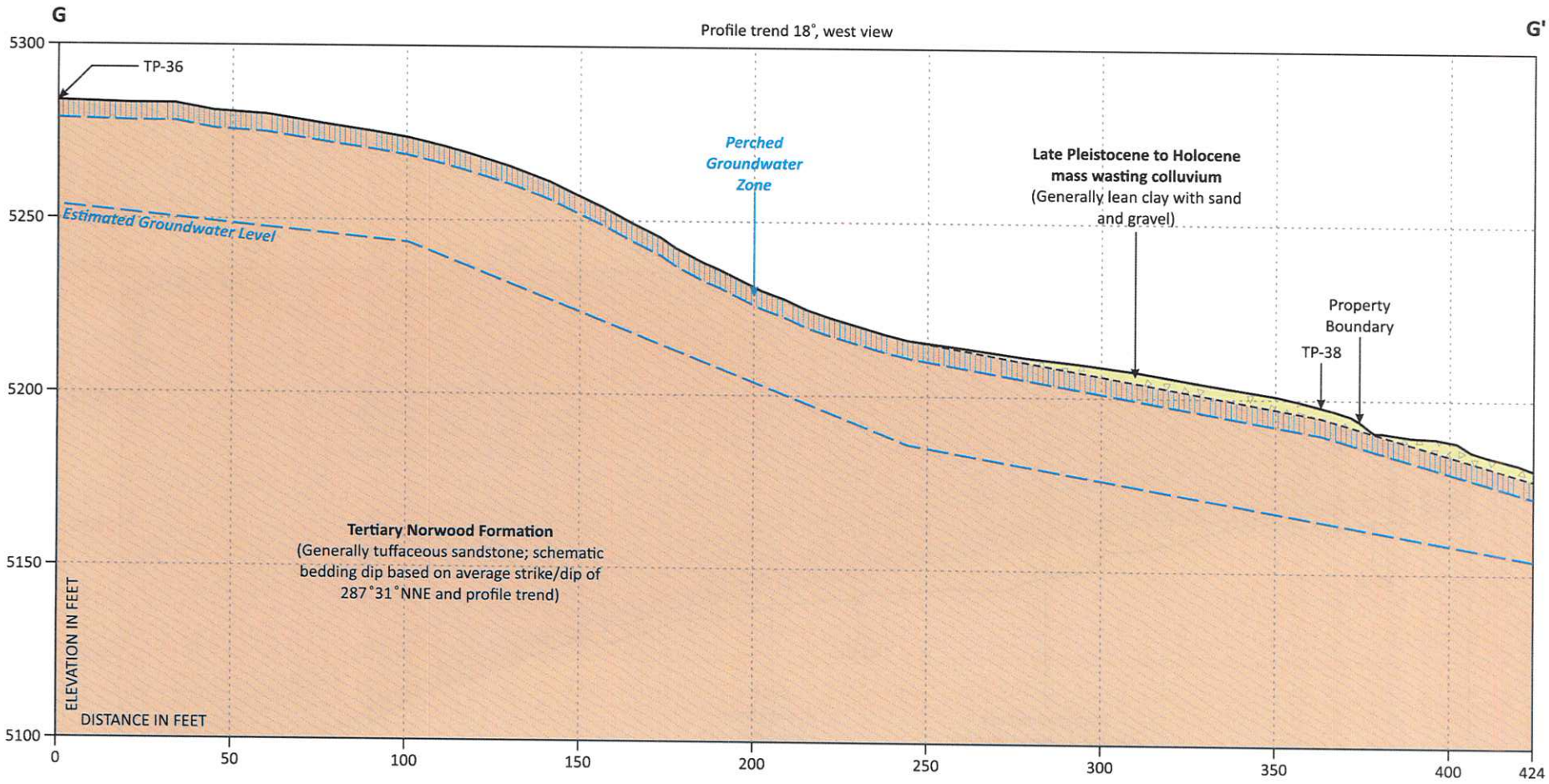
GEOLOGIC CROSS SECTION F-F'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5F

WESTERN GEOLOGIC

Scale 1 inch equals 30 feet (1:360) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



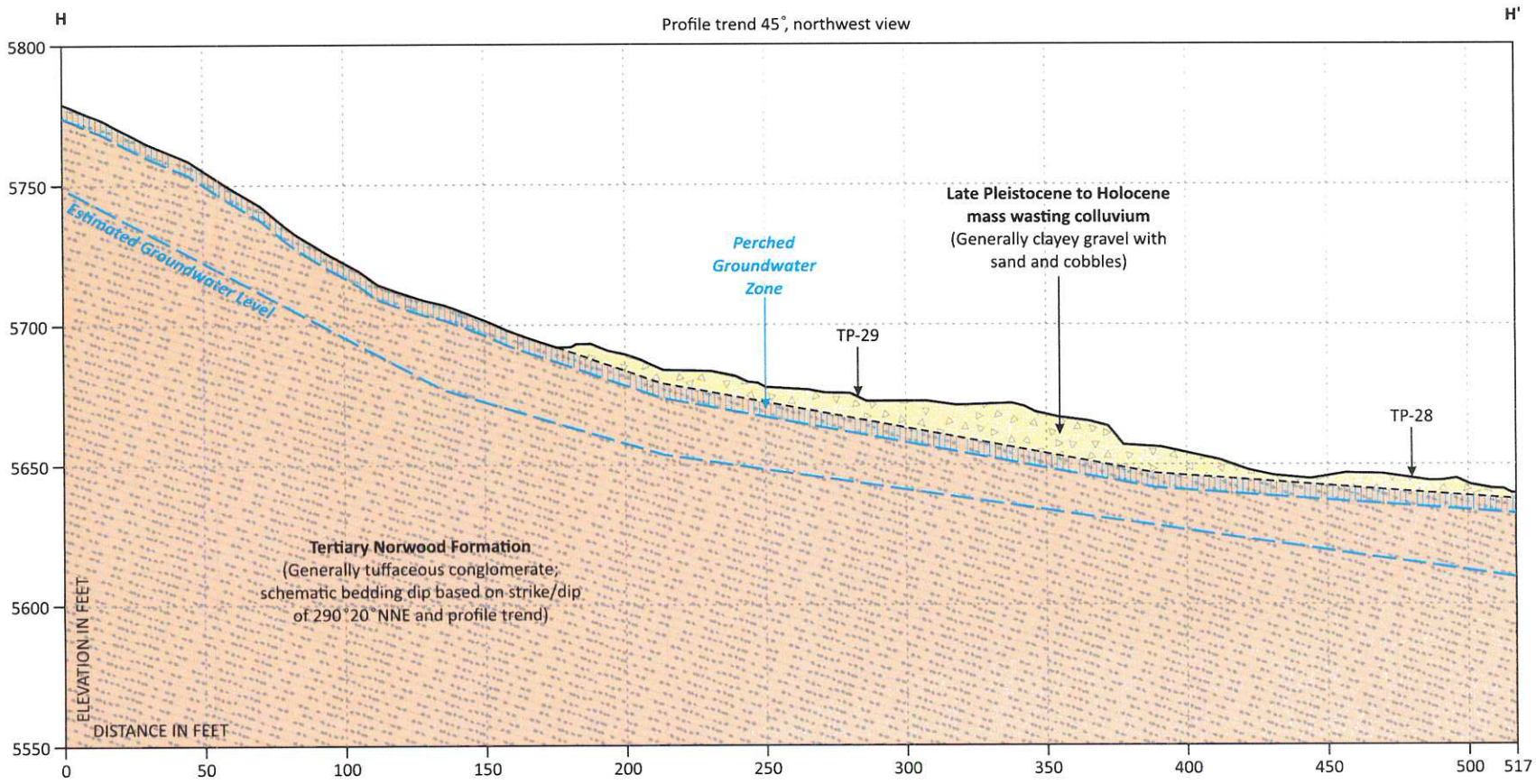
GEOLOGIC CROSS SECTION G-G'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5G

WESTERN GEOLOGIC

Scale 1 inch equals 30 feet (1:360) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



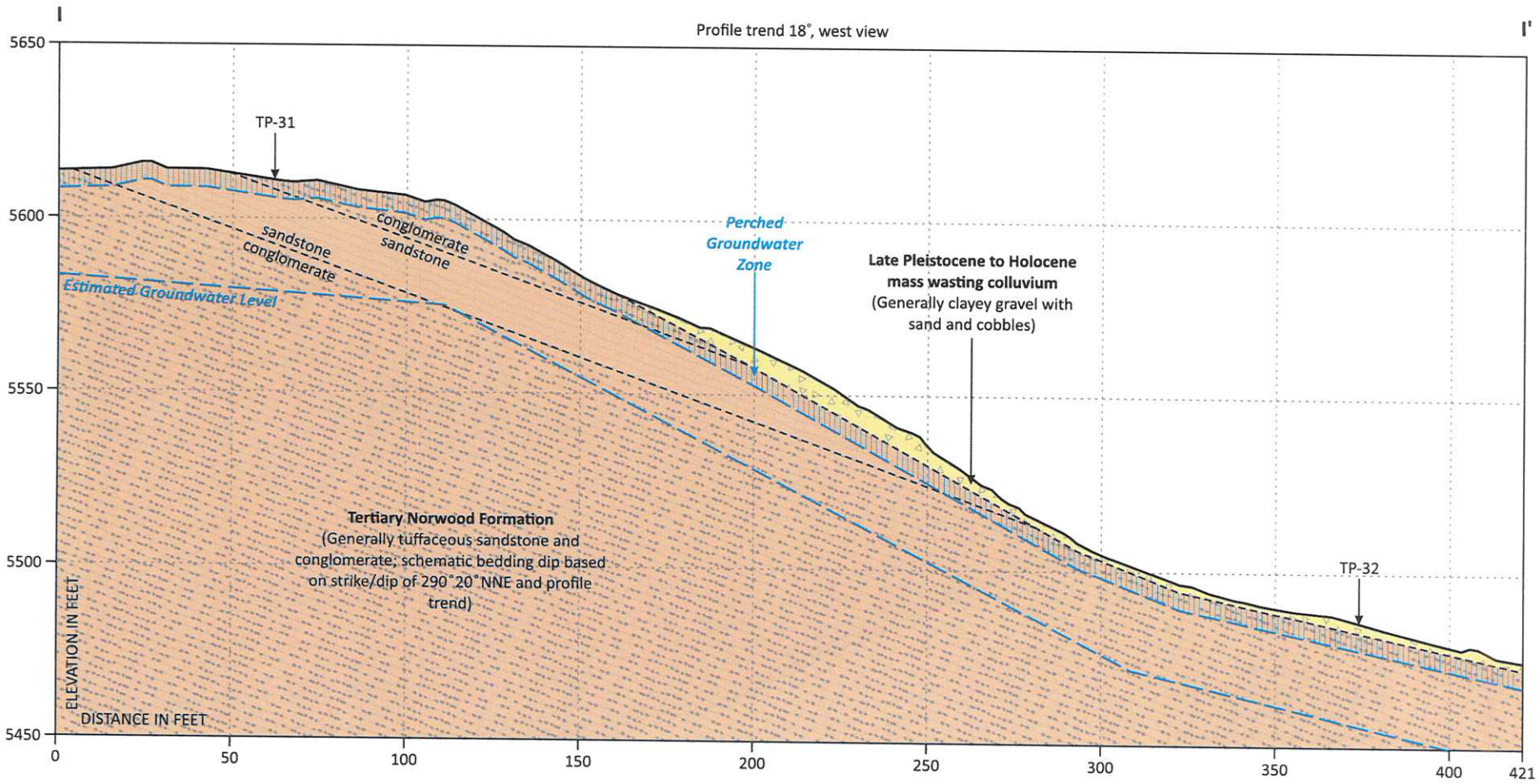
GEOLOGIC CROSS SECTION H-H'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5H

WESTERN GEOLOGIC

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



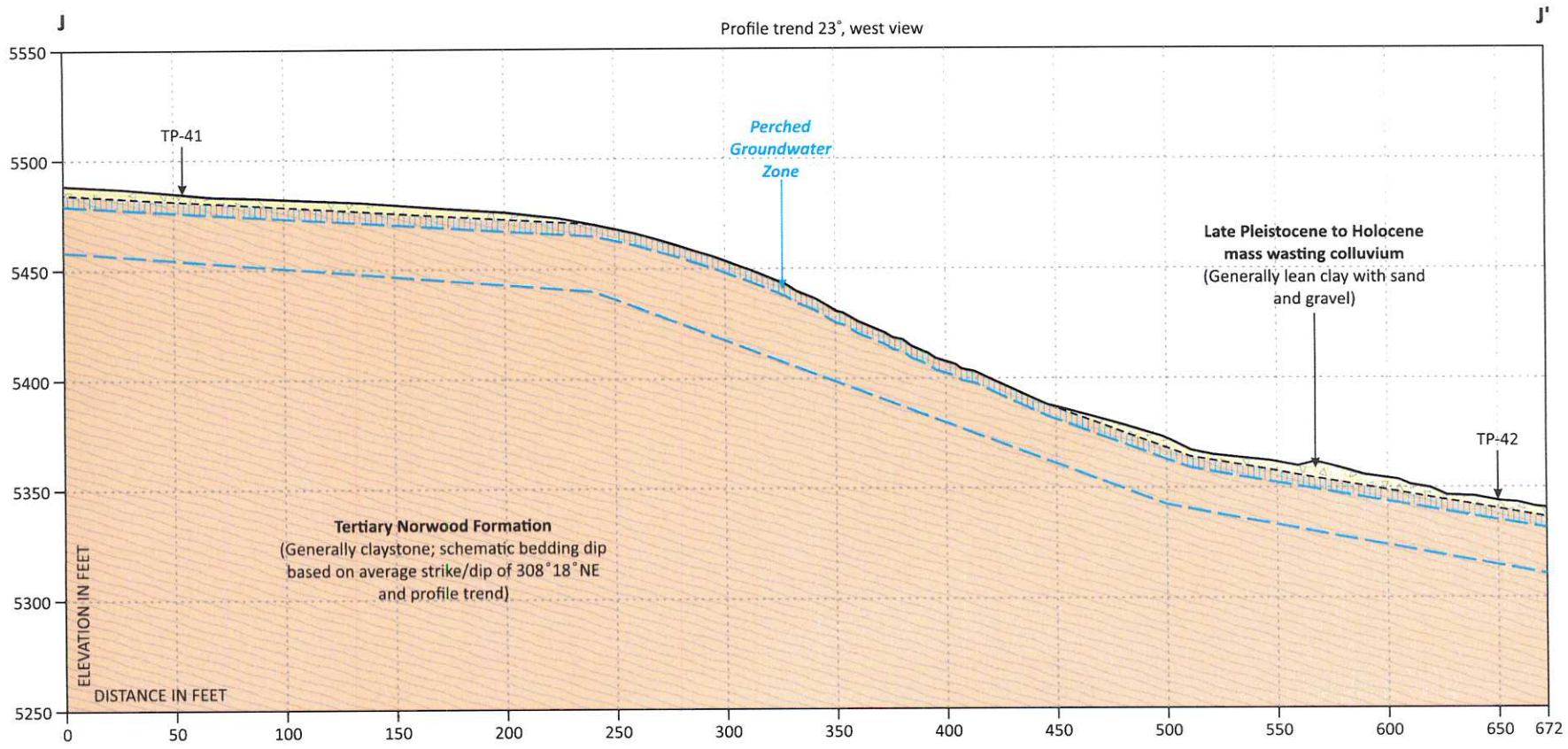
WESTERN GEOLOGIC

Scale 1 inch equals 30 feet (1:360) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

GEOLOGIC CROSS SECTION I-I'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5I



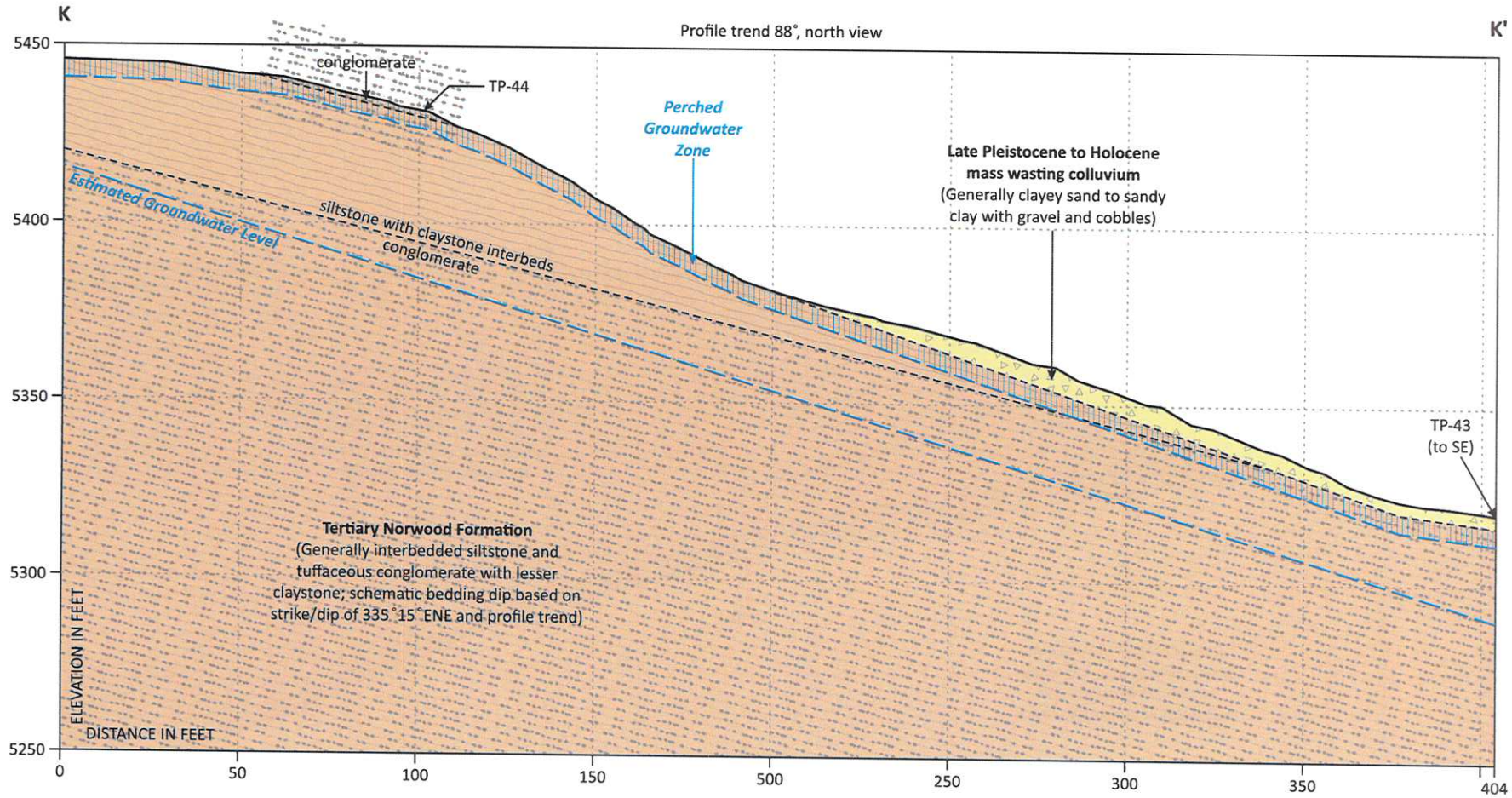
GEOLOGIC CROSS SECTION J-J'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5J

WESTERN GEOLOGIC

Scale 1 inch equals 50 feet (1:600) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

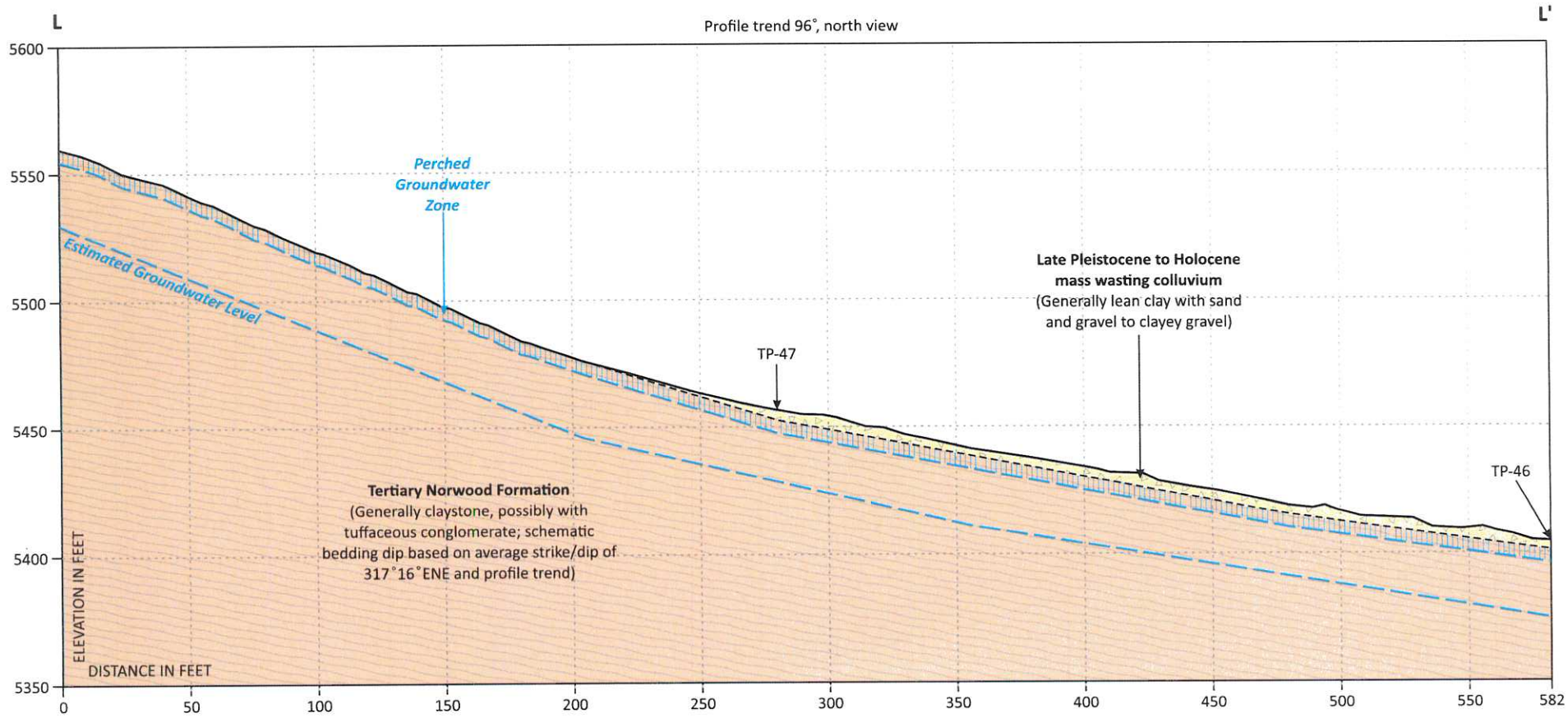


GEOLOGIC CROSS SECTION K-K'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5K

Scale 1 inch equals 30 feet (1:360) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



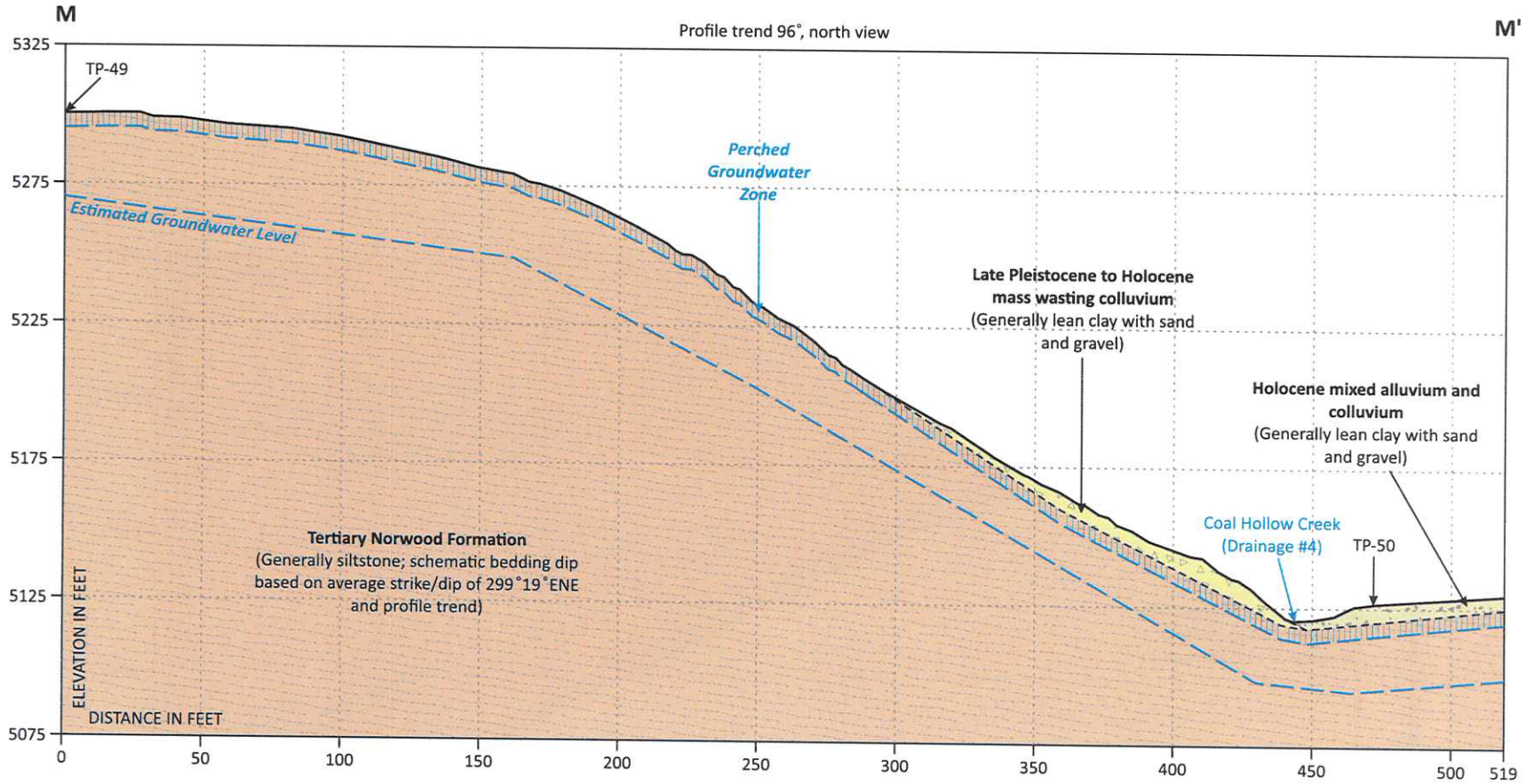
GEOLOGIC CROSS SECTION L-L'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5L

WESTERN GEOLOGIC

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

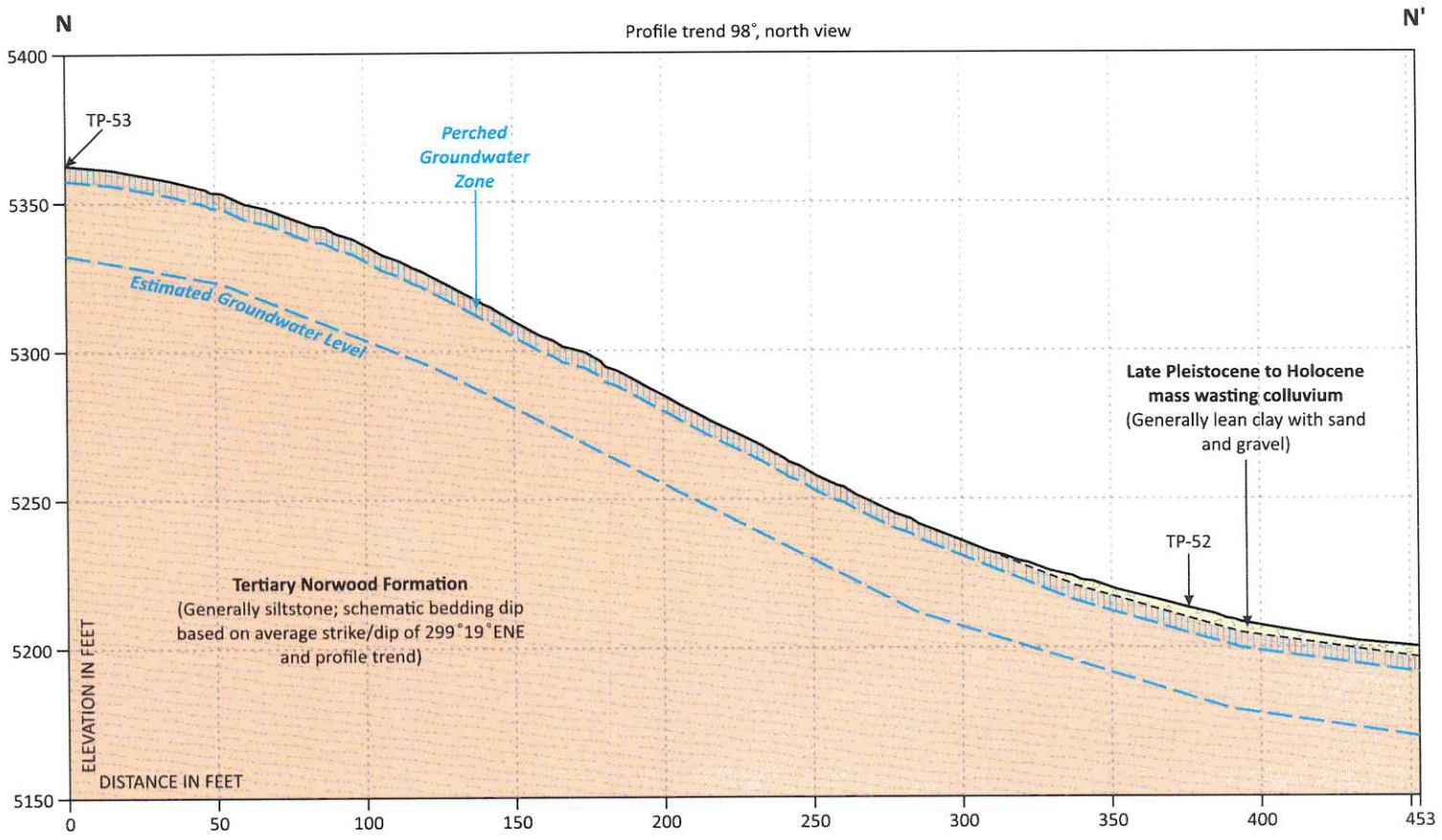


Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

GEOLOGIC CROSS SECTION M-M'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5M

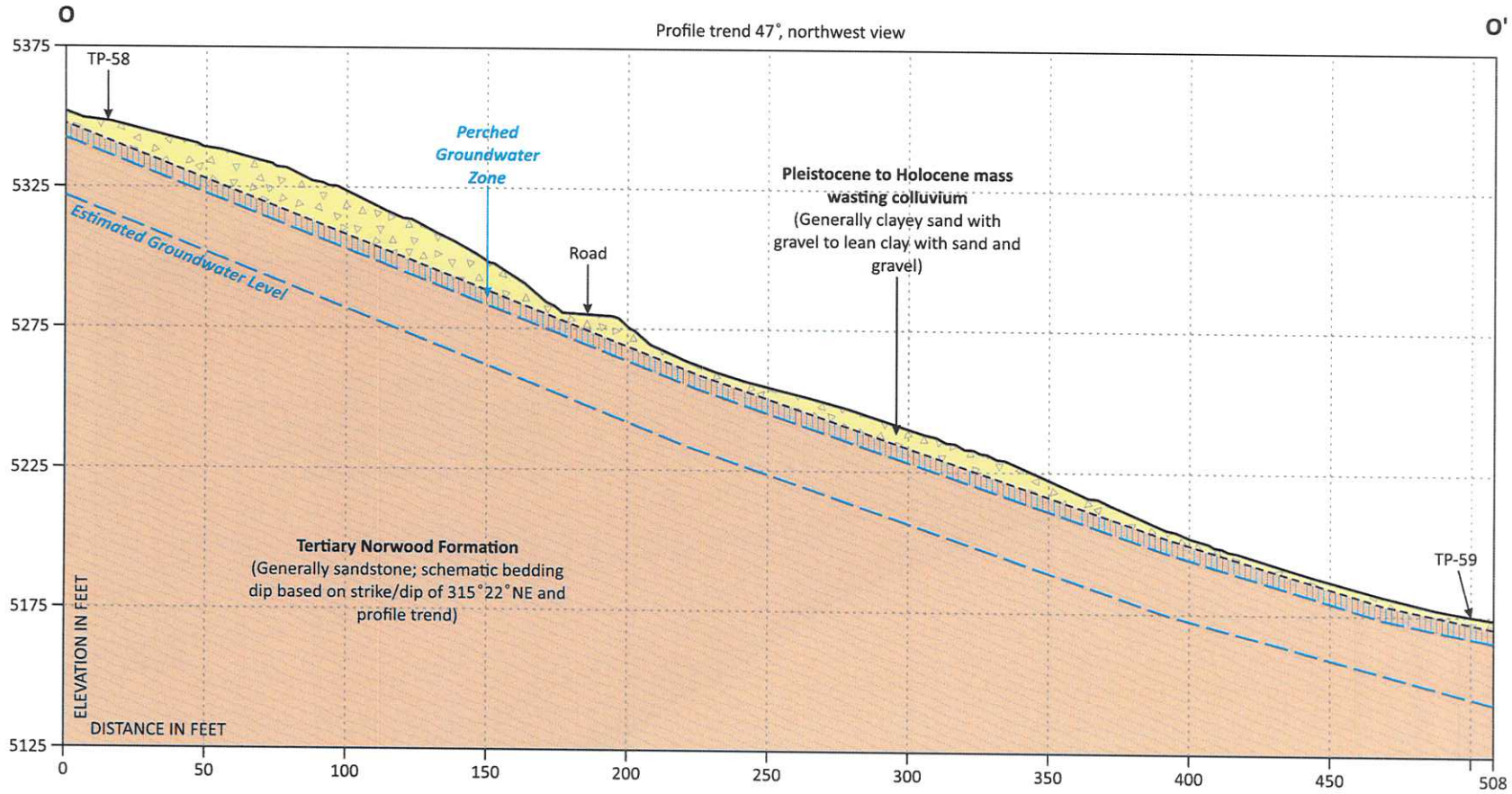


GEOLOGIC CROSS SECTION N-N'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5N

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



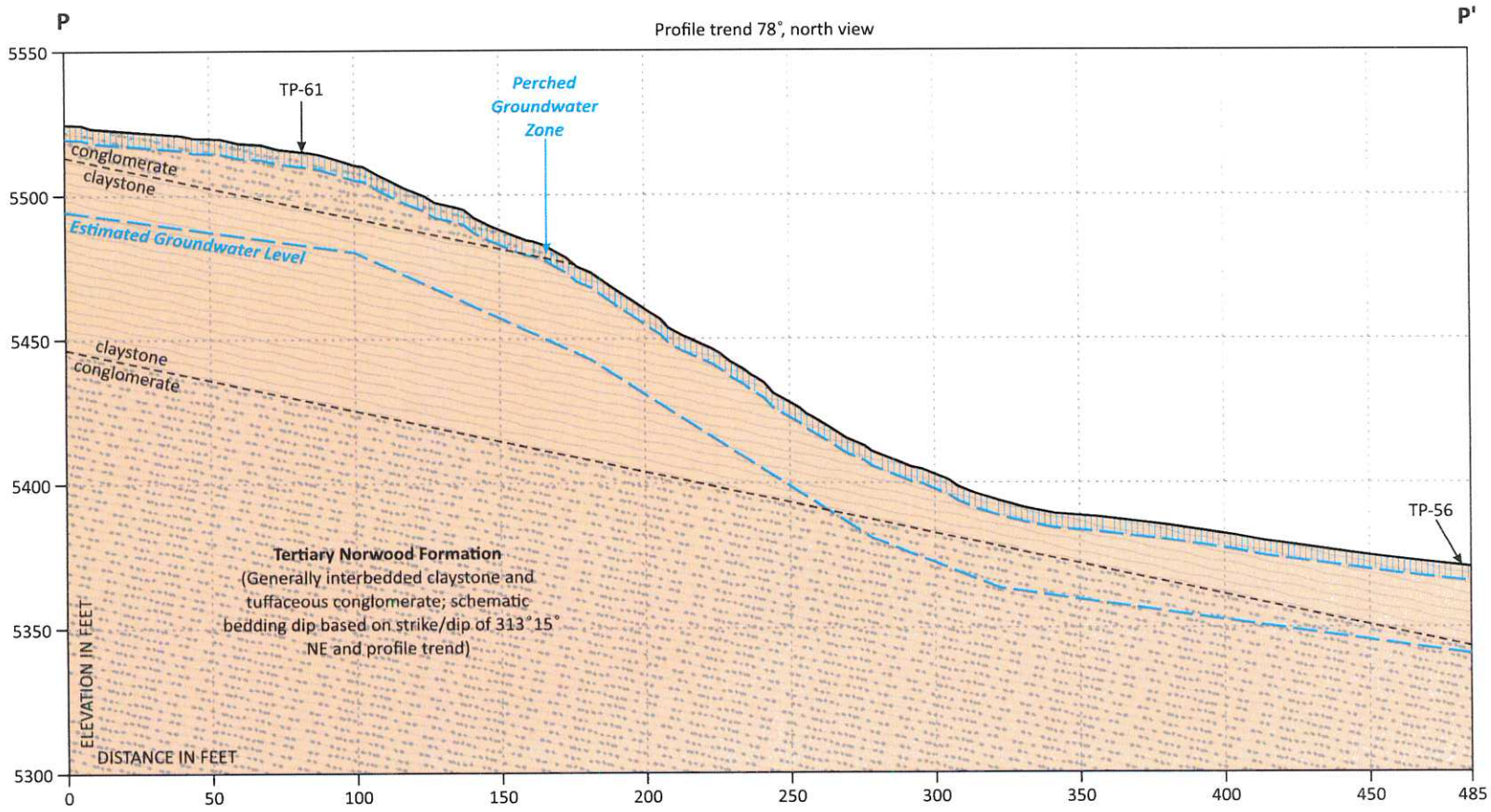
GEOLOGIC CROSS SECTION O-O'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5O

WESTERN GEOLOGIC

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



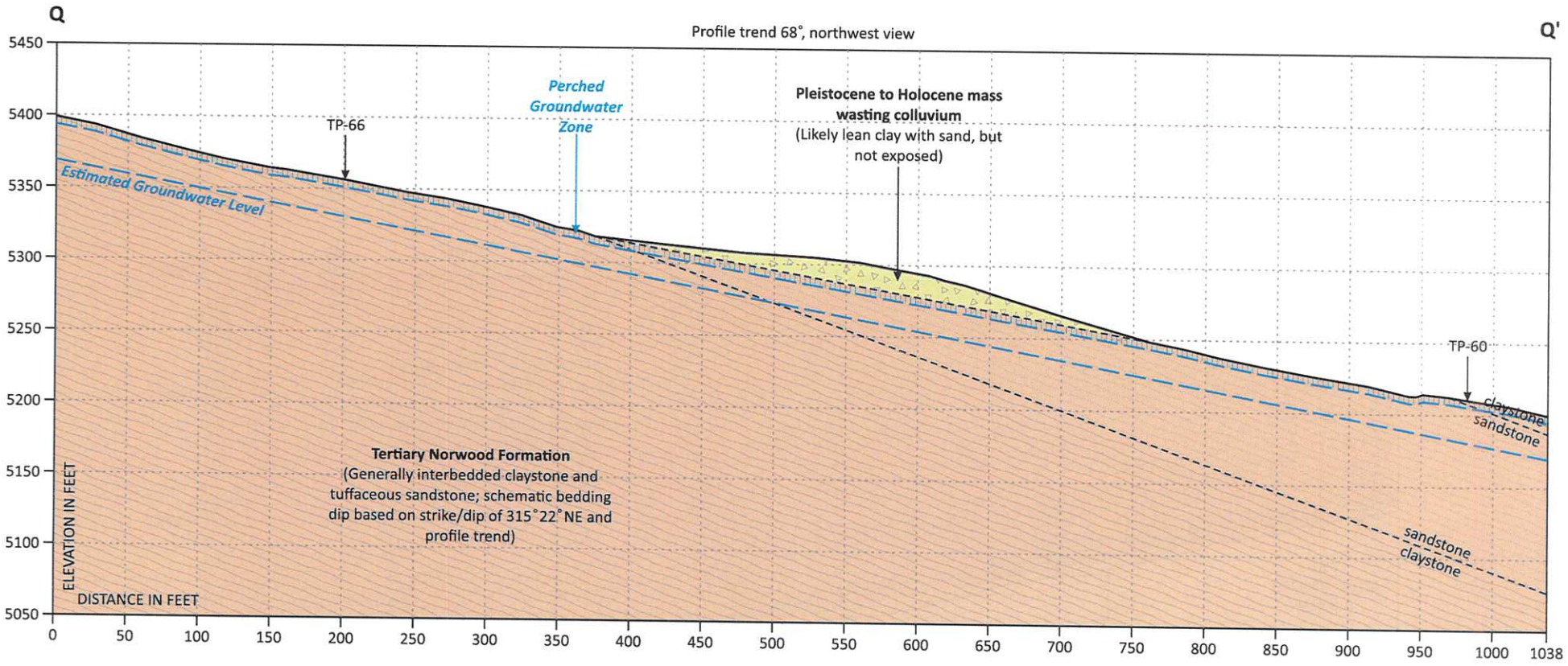
GEOLOGIC CROSS SECTION P-P'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5P

WESTERN GEOLOGIC

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

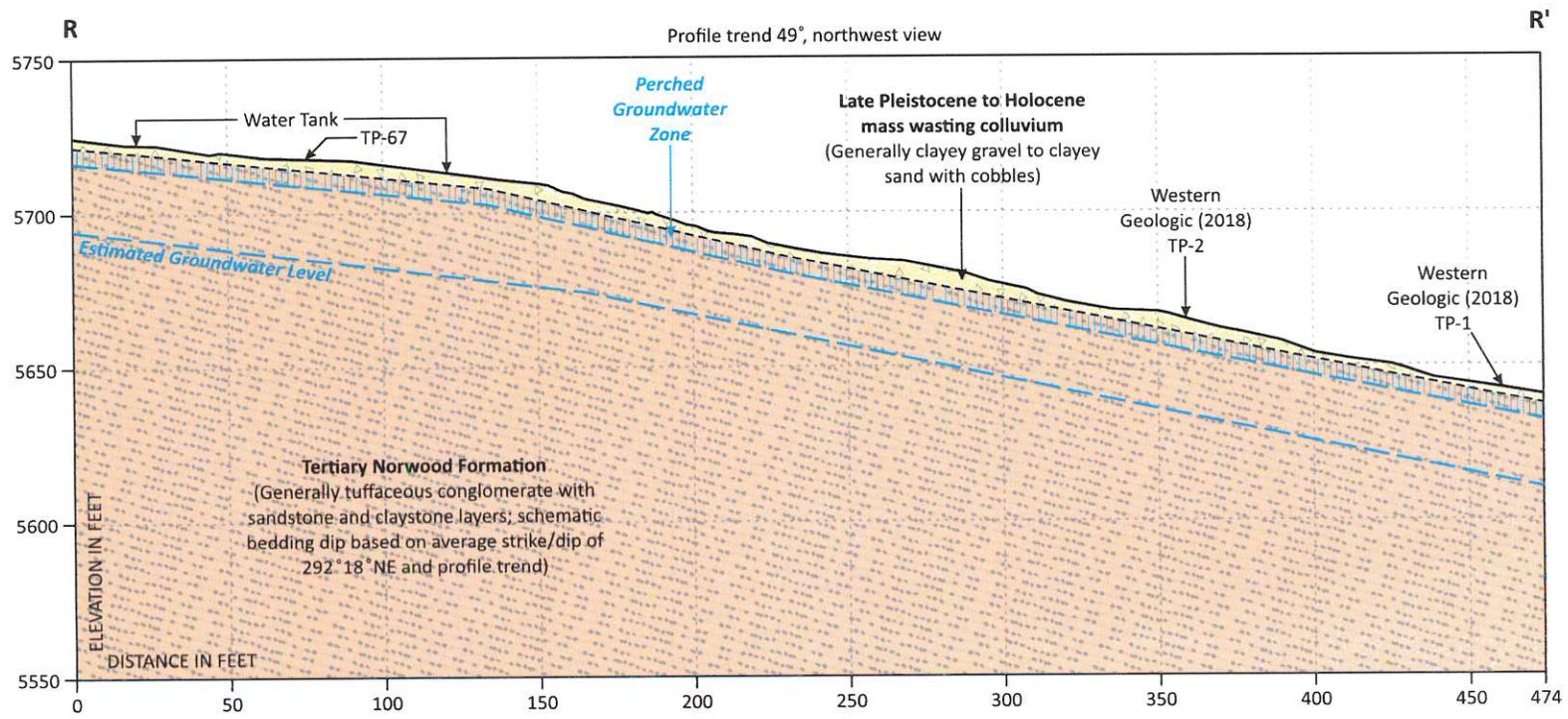


GEOLOGIC CROSS SECTION Q-Q'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5Q

Scale 1 inch equals 70 feet (1:840) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.

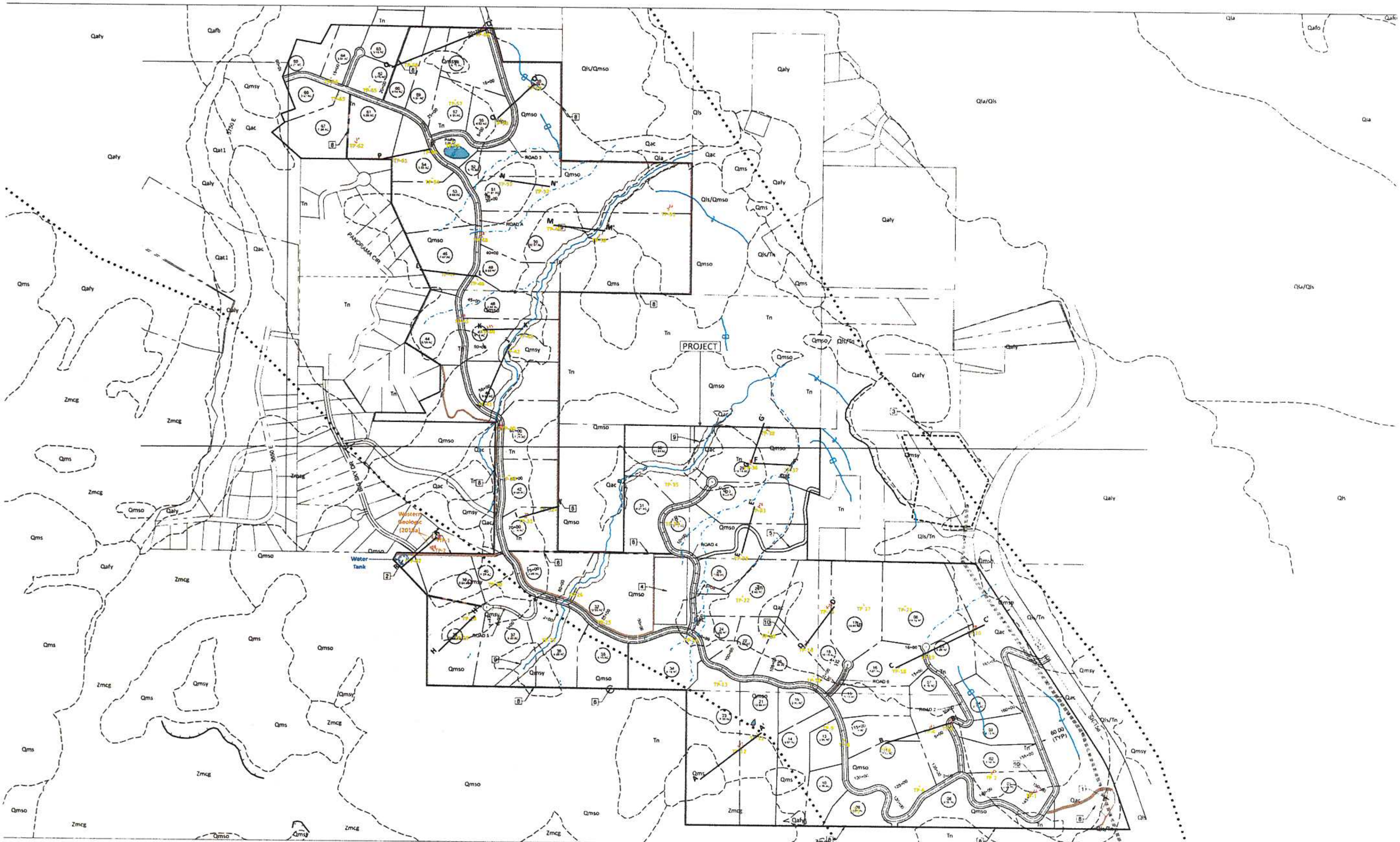


GEOLOGIC CROSS SECTION R-R'

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

FIGURE 5R

Scale 1 inch equals 40 feet (1:480) with no vertical exaggeration.
All units and contacts are approximate and inferred based on available subsurface data; variations may occur laterally, at depth and within units.
Topographic profile based on geoprocessed 2016 LIDAR data.



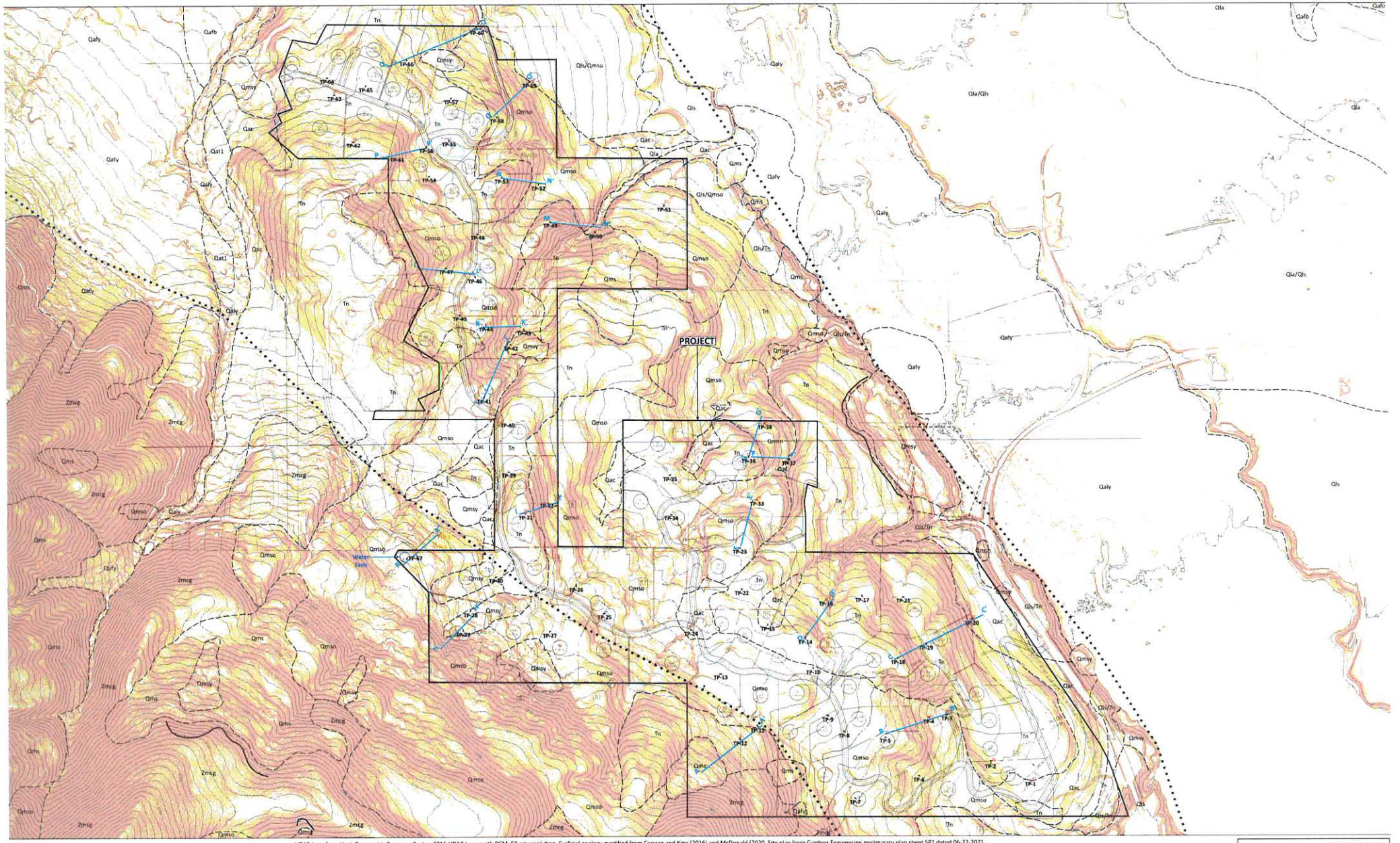
Air photo base from Utah Geographic Resource Center, 2012 high resolution orthophoto, 12.5 cm resolution. Surficial geology modified from Coogan and King (2016) and McDonald (2020). Site plan from Gardner Engineering preliminary plan sheet SP1 dated 06.22.2021

0 400 800 feet
Scale 1:4,800 (1 inch equals 400 feet)

SITE EVALUATION

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
7056 Highway 156
Eden, Weber County, Utah

PLATE 1



LIDAR base from Utah Geographic Resource Center, 2016 LIDAR bare earth DEM, 50 cm resolution. Surficial geology modified from Coogan and King (2016) and McDonald (2020). Site plan from Gardner Engineering preliminary plan sheet SP1 dated 06-22-2021.
Contours generated by Global Mapper from geoprocessed LIDAR data, 20 foot interval. Slopes < 20% gradient unshaded; 20-30% gradient shaded in yellow, and > 30% gradient shaded in red.

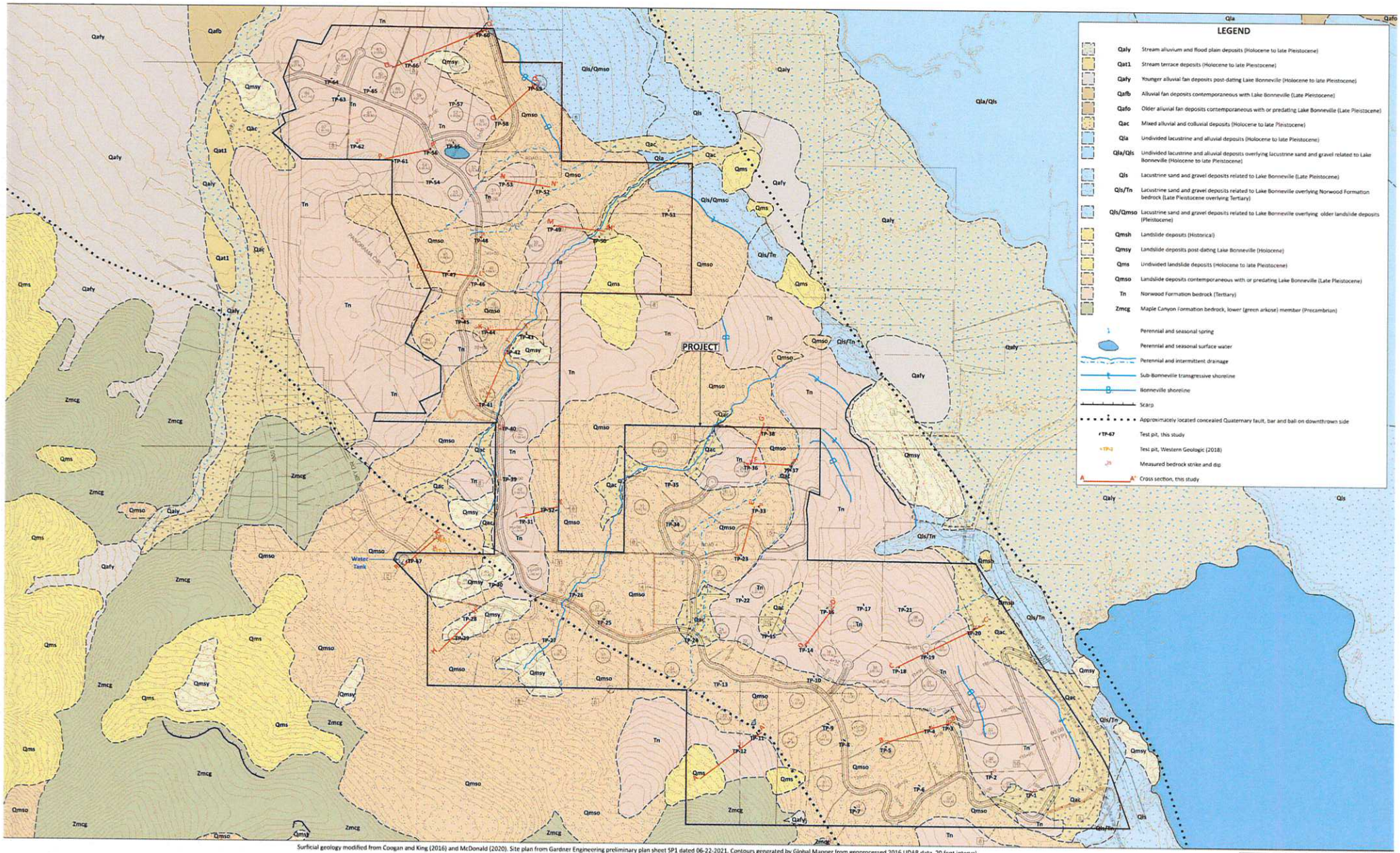
0 400 800 feet
Scale 1:4,800 (1 inch equals 400 feet)

WESTERN GEOLOGIC

LIDAR ANALYSIS

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

PLATE 2



Surficial geology modified from Coogan and King (2016) and McDonald (2020). Site plan from Gardner Engineering preliminary plan sheet SP1 dated 06-22-2021. Contours generated by Global Mapper from geoprocessed 2016 LIDAR data, 20 foot interval.

WESTERN GEOLOGIC

SURFICIAL GEOLOGY

GEOLOGIC HAZARDS EVALUATION
Proposed Osprey Ranch Development
2050 Highway 150
Eden, Weber County, Utah

PLATE 3

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Request for approval of a conditional use permit for an additional pump house located at approximately 2051 N Highway 158, Eden.
Application Type:	Administrative
File Number:	CUP 2022-07
Applicant:	Powder Mountain Water and Sewer
Approximate Address:	7780 E Summit Pass, Eden, UT, 84310.
Project Area:	6600 Square feet
Zoning:	DRR-1
Existing Land Use:	Vacant
Proposed Land Use:	Public Utility Substation
Parcel ID:	23-012-0141
Township, Range, Section:	Township 7 North, Range 2 East, Section 06 NW

Adjacent Land Use

North:	Cache County Boundary	**South:**	Powder Ridge Rd/Summit Pass Rd
East:	Vacant	**West:**	Vacant

Staff Information

Report Presenter:	Tammy Aydelotte taydelotte@webercountyutah.gov 801-399-8794
Report Reviewer:	SB

Applicable Ordinances

- Weber County Land Use Code Title 104 Chapter 29 (DRR-1 Zone)
- Weber County Land Use Code Title 108 Chapter 4 (Conditional Uses)
- Weber County Land Use Code Title 108 Chapter 10 (Public Utility Substations)
- Weber County Land Use Code Title 108 Chapter 2 (Ogden Valley Architectural, Landscape, and Screening Standards)
- Weber County Land Use Code Title 108 Chapter 1 (Design Review)

Background and Summary

Applicant is requesting a conditional use permit for a pressurized water system to service the Hidden Lake Lodge area. This proposal consists of a dedicated booster pump station with capacity to supply PID and fire flow (1,500 gpm), existing site improvements, distribution pipe (10", 8", 2" pipe, hydrants, and a PRV station).

The application is being processed as an administrative review due to the approval procedures in Uniform Land Use Code of Weber County, Utah (LUC) §108-1-2 which requires the planning commission to review and approve applications for conditional use permits and design reviews.

Analysis

General Plan: As a conditional use, this operation is allowed in the DRR-1 Zone. With the establishment of appropriate conditions as determined by the land use authority, this operation will not negatively impact any of the goals and policies of the General Plan.

Zoning: The subject property is located within the DRR-1 zone. The purpose and intent of the DRR-1 zone are described in LUC 104-29-1:

> *"…to provide flexible development standards to resorts that are dedicated to preserving open space and creating extraordinary recreational resort experiences while promoting the goals and objectives of the Ogden Valley general plan. It is intended to benefit the residents of the county and the resorts through its ability to preserve the valley's rural character, by utilizing a mechanism that allows landowners to voluntarily transfer development rights to areas*

that are more suitable for growth when compared to sensitive land areas such as wildlife habitats, hazardous hillsides or prime agricultural parcels. Resorts within an approved destination and recreation resort zone shall, by and large, enhance and diversify quality public recreational opportunities, contribute to the surrounding community's well-being and overall, instill a sense of stewardship for the land."

The DRR-1 zone allows the proposed use, as a conditional use in the DRR-1 zone. The proposed site plan indicates that the proposed pump station will be at least 20 feet from the south (front) lot line, 150 feet from the rear lot line, 30 feet from the east side lot line, and at least 250 feet from the west side lot line.

Under the LUC 108-10, there is not minimum lot area for public utility substations. The proposed improvements will be located on a site of approximately 10,000 square feet.

Conditional Use Review: A review process has been outlined in LUC §108-4-3 to ensure compliance with the applicable ordinances and to mitigate anticipated detrimental effects. The applicant has received approval from the County Engineering Division and the Weber Fire District for the proposal.

The following is an analysis of the proposal reviewed against the conditional use standards:

(1) Standards relating to safety for persons and property. The proposal is not anticipated or expected to negatively impact this property, surrounding properties, or persons.

(2) Standards relating to infrastructure, amenities, and services: The proposal is not anticipated or expected to negatively impact any existing infrastructure, amenities, or services in the area.

(3) Standards relating to the environment. The proposal is not anticipated or expected to negatively impact the environment.

(4) Standards relating to the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan. The proposal is not anticipated to negatively impact the surrounding area, nor is it contrary to the recommendations of the general plan.

Design Review: The proposed conditional use mandates a design review as outlined in LUC §108-1 to ensure that the general design, layout and appearance of the building remains orderly and harmonious with the surrounding neighborhood. The matters for consideration are as follows:

Considerations relating to traffic safety and traffic congestion. The proposal includes a site plan that identifies an existing access off of Summit Pass Road to the existing pump house. Neither traffic safety hazards nor traffic congestion are anticipated given the minimal site visitations to the substations.

Considerations relating to landscaping. The site consists of natural landscaping that meets the requirements outlined in the Architectural, Landscape, and Screening Design Standards (108-2).

Considerations relating to buildings and site layout. The applicant has submitted elevations of the proposed pump house addition (**Exhibit A**) that match the existing structure which complies with the aesthetic requirements outlined in LUC 108-2. Exterior materials include vertical cement hardie board siding, with concrete along the bottom of the structure. The proposed tank will be made entirely of concrete which also complies with applicable aesthetic requirements.

Review Agencies: Weber Fire District has approved this application. Weber County Engineering has not yet reviewed this application.

Staff Recommendation

Staff recommends approval of this conditional use application subject to the applicant meeting all review agency requirements and the following conditions:

1. Any outdoor lighting must meet the requirements of the Ogden Valley Outdoor Lighting Ordinance (108-16).

This recommendation is based on the following findings:

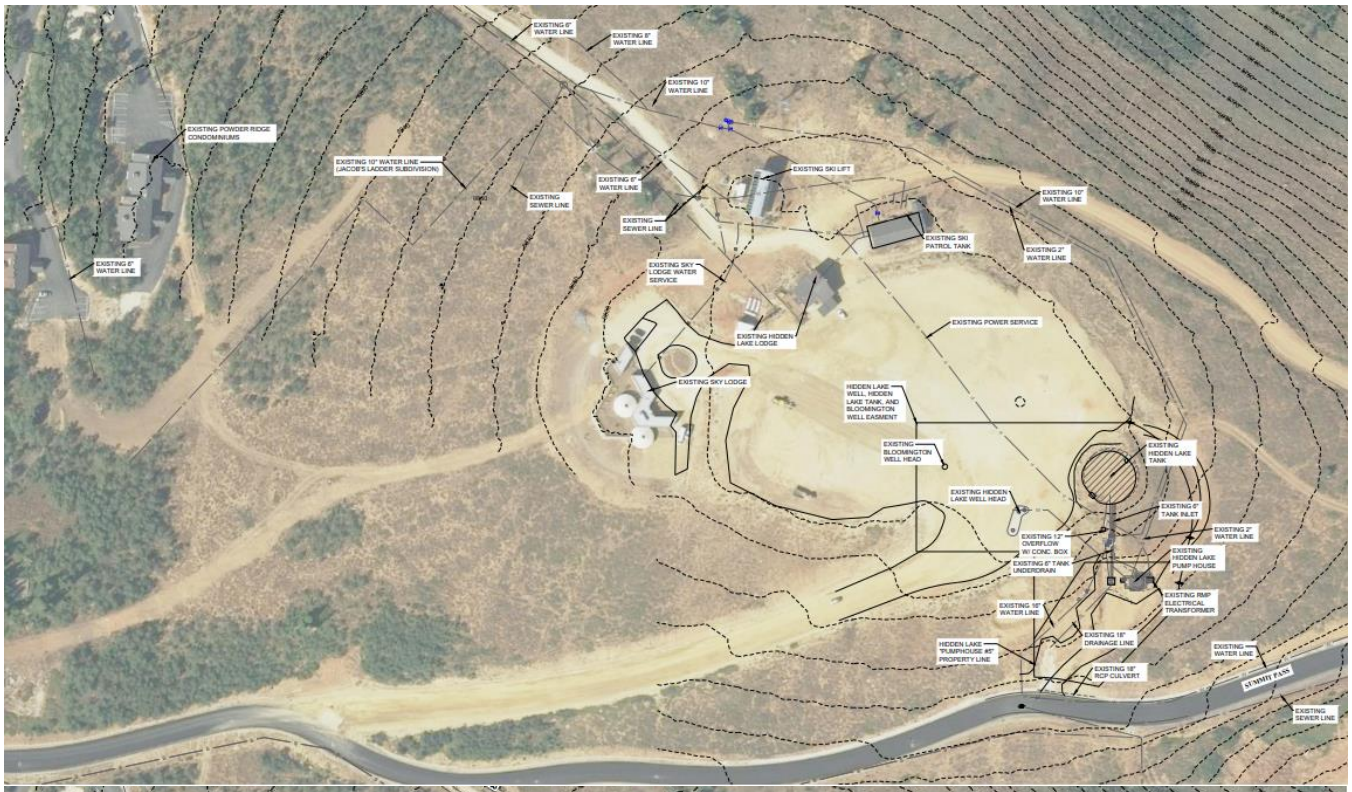
1. The proposed use is allowed in the DRR-1 zone and meets the appropriate site development standards.
2. The criteria for issuance of a conditional use permit have been met because mitigation of potential detrimental effects can be accomplished.

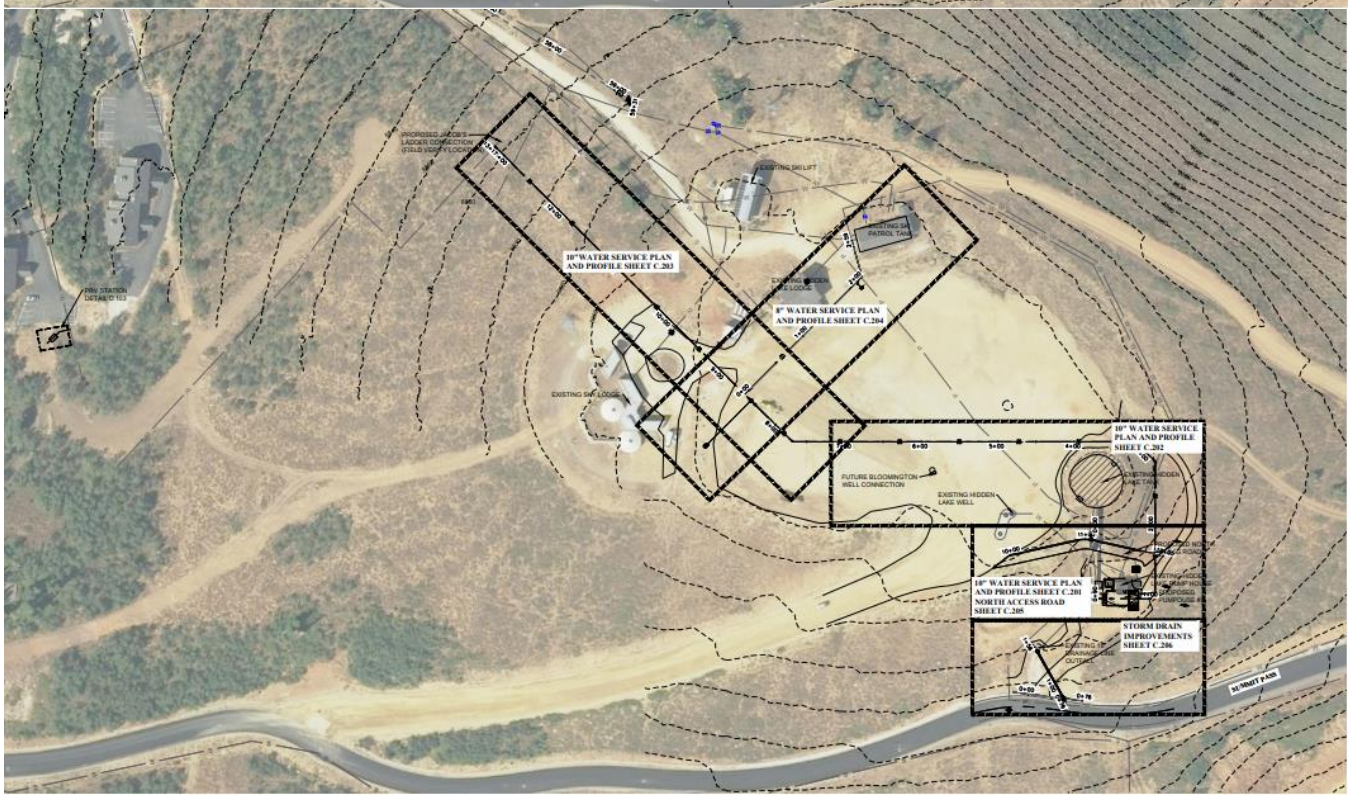
Exhibits

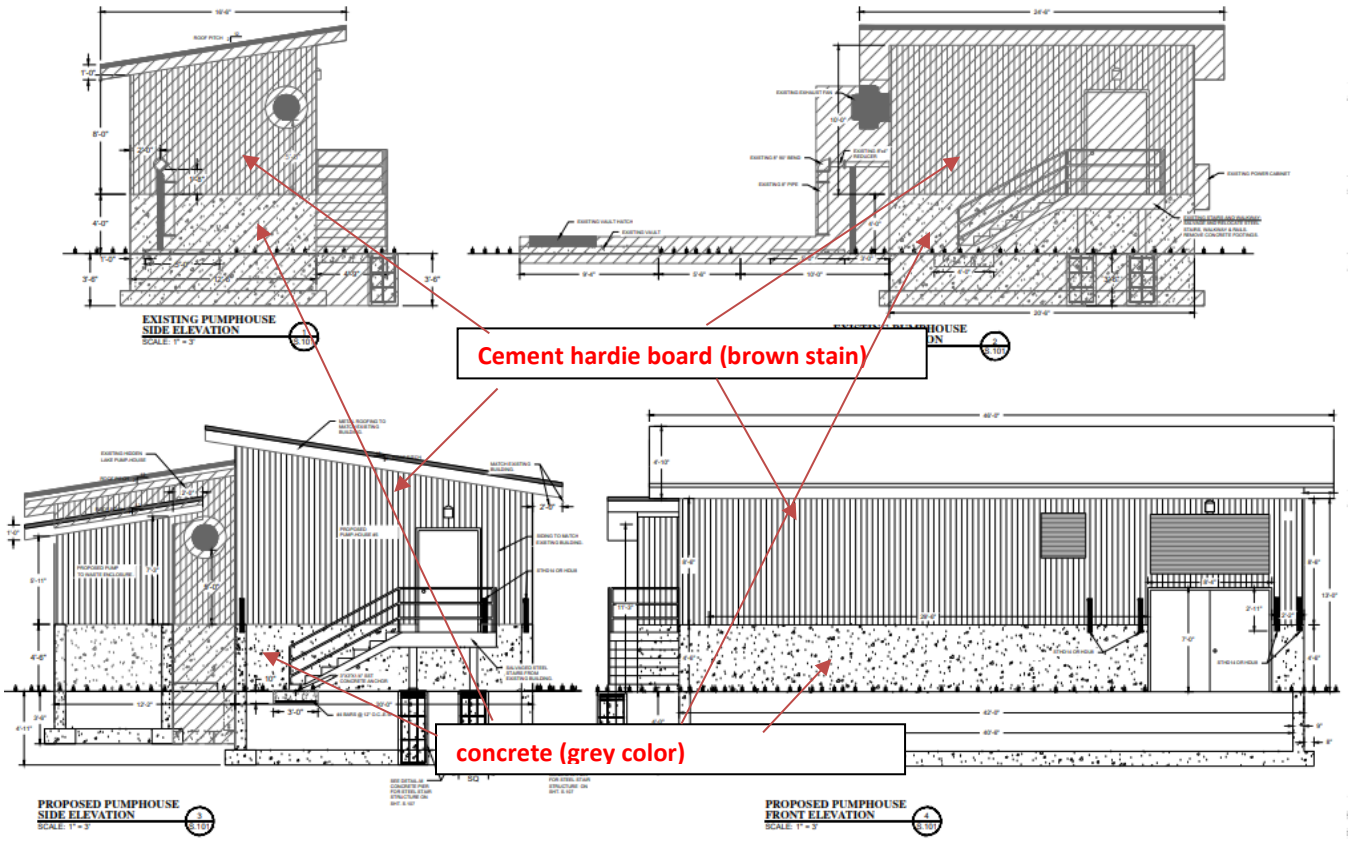
A. Building elevations and Site Plan
B. Application and Narrative
C. Plan Detail

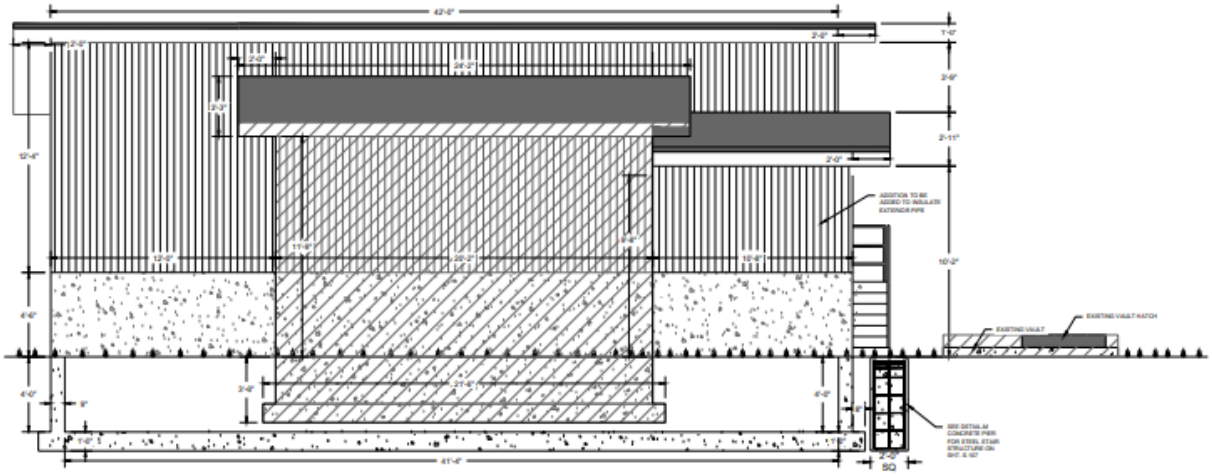
Map 1

Exhibit A – Building Elevations and Site Plan

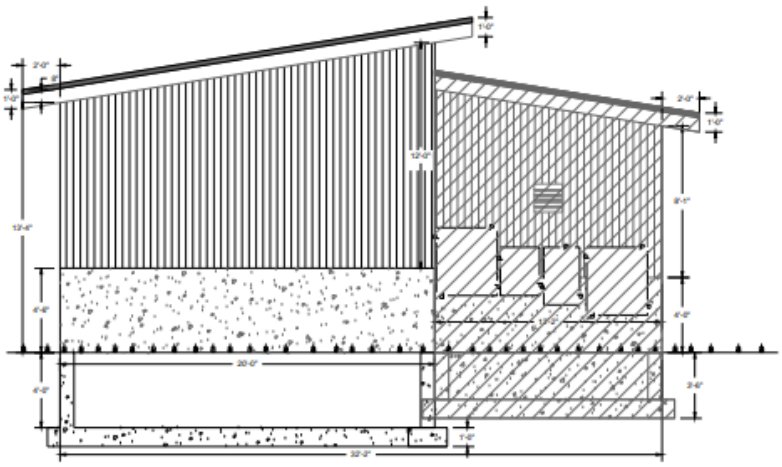





EXISTING PUMPHOUSE
SIDE ELEVATION
SCALE: 1" = 3"
Cement hardie board (brown stain)
concrete (grey color)
PROPOSED PUMPHOUSE
SIDE ELEVATION
SCALE: 1" = 3"
PROPOSED PUMPHOUSE
FRONT ELEVATION
SCALE: 1" = 3"

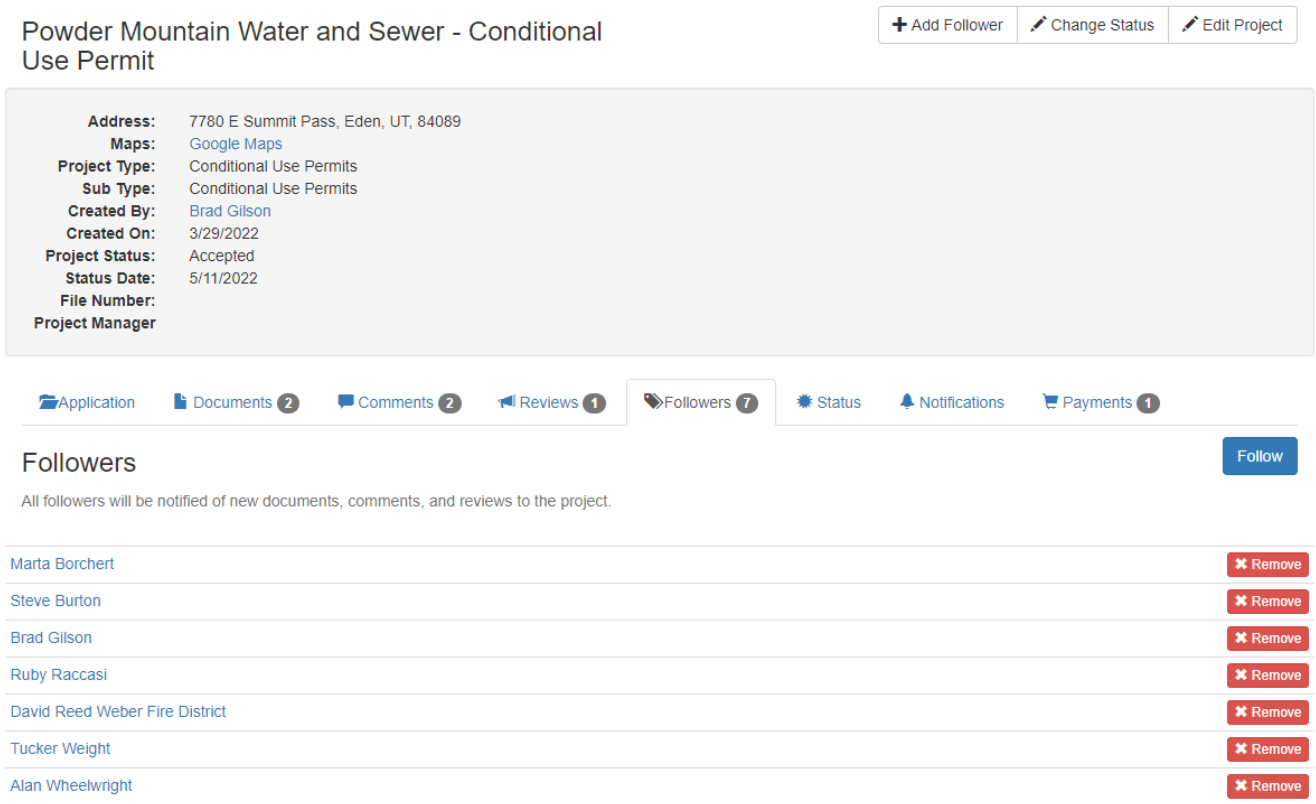


PROPOSED PUMPHOUSE
REAR ELEVATION
SCALE: 1" = 3'



PROPOSED PUMPHOUSE
SIDE ELEVATION
SCALE: 1" = 3'

Exhibit B – Application and Narrative



Powder Mountain Water and Sewer - Conditional Use Permit

+ Add Follower | Change Status | Edit Project

Address: 7780 E Summit Pass, Eden, UT, 84089
Maps: Google Maps
Project Type: Conditional Use Permits
Sub Type: Conditional Use Permits
Created By: Brad Gilson
Created On: 3/29/2022
Project Status: Accepted
Status Date: 5/11/2022
File Number:
Project Manager

Application | Documents 2 | Comments 2 | Reviews 1 | Followers 7 | Status | Notifications | Payments 1

Followers

Follow

All followers will be notified of new documents, comments, and reviews to the project.

Marta Borchert	✖ Remove
Steve Burton	✖ Remove
Brad Gilson	✖ Remove
Ruby Raccasi	✖ Remove
David Reed Weber Fire District	✖ Remove
Tucker Weight	✖ Remove
Alan Wheelwright	✖ Remove

Narrative:

The Powder Mountain Water and Sewer Improvement District (PMWSID) provides public water system service to the Powder Mountain Ski Resort and other public developments located within PMWSID boundaries. PMWSID is seeking a conditional use permit for the following key water infrastructure projects as described below.

Buildings located at the “Top of the Mountain” (i.e. Hidden Lake Lodge area) are located at a high enough elevation that the existing Hidden Lake water storage tank will not provide adequate working pressure. A separate pressurized system is required to service this area.

The Top of the Mountain Pressure system consists of the following:

1. Dedicated Booster Pump Station with Capacity to supply PID and Fire Flow (1,500 gpm) (including addition to an existing building and site improvements)

2. Distribution Pipe (including; 10", 8", and 2" pipelines, fire hydrants, and a Pressure Reducing Valve (PRV) station, etc.).

Sizing requirements, required infrastructure, estimated costs are included in this report.

System-Wide

The subject project will be constructed per approved construction plans.

Exhibit C – Plan Detail

See attached.

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Consideration and/or action on a conditional use permit for a conference/education center located in the Evergreen Subdivision at approximately 2257 N River View Road, Huntsville, UT, 84317.
Agenda Date:	Tuesday, April 26, 2022
Applicant:	Emily Nicolosi, Owner
File Number:	CUP 2022-03

Property Information

Approximate Address:	2257 N River View Rd, Huntsville, UT, 84317
Project Area:	13.98 acres
Zoning:	Forest Zone (F-40)
Existing Land Use:	Residential
Proposed Land Use:	Residential/Conference/Education Center
Parcel ID:	23-026-0032, 23-026-0033, 23-026-0034, 23-026-0035
Township, Range, Section:	T7N, R3E, Section 31 SE

Adjacent Land Use

North:	Vacant Residential	**South:**	Vacant Residential
East:	N River View Circle	**West:**	Vacant

Staff Information

Report Presenter:	**Tammy Aydelotte** taydelotte@webercountyutah.gov 801-399-8794
Report Reviewer:	SB

Applicable Ordinances

- Weber County Land Use Code Title 101 Chapter 1 General Provisions, Section 7 Definitions
- Weber County Land Use Code Title 104 Chapter 9 (F-40 Zone)
- Weber County Land Use Code Title 108 Chapter 4 (Conditional Uses)

Summary and Background

The applicant is requesting approval of a conditional use permit for a conference/education center located in the F-40 zone at 2257 N River View Rd, Huntsville (see **Exhibit A)**. The F-40 Zone allows a "conference/education center" as a conditional use. The applicant is proposing to phase their plans for the proposed use (**see Exhibit C)**. The education center is proposed to occupy a portion of four parcels and include a vegetable garden, trails, an orchard, and some dedicated agricultural area, as well as a pavilion, a barn, and a guesthouse. Under the definition of a conference/education center, "Such a facility may serve meals and offer day use and/or overnight lodging facilities."

This proposal is intended to educate participants on sustainable living systems, environmental stewardship, and related activities. The guest house would be used to accommodate overnight guests as part of the educational activities. With these occurring in small groups (up to 12, staying between 2-7 days at a time, and occurring a few times per month (2-3 stays per month), and during the warmer months (April-October), the expected impact is minimal. The applicant is proposing on-site septic system and a well, to address water and sewer needs.

Analysis

General Plan: As a conditional use, this operation is allowed in the F-40 Zone. With the establishment of appropriate conditions as determined by the Planning Commission, this operation will not negatively impact any of the goals and policies of the General Plan.

Zoning: The subject property is located within the Forest (F-40) Zone. The purpose of the F-40 Zone can be further described in LUC §104-14-1 as follows:

The intent of the forest zones is to protect and preserve the natural environment of those areas of the county that are characterized by mountainous, forest or naturalistic land, and to permit development compatible to the preservation of these areas.

A conference/education center is listed as a conditional use in the F-40 zone.

A conference/education center is defined by LUC §101-2-4 as follows:

The term "conference/education center" means a facility designed for the purpose of conducting meetings for consultation, exchange of information and/or discussion which results in enhanced personal, business and/or professional development. A conference/education center may provide office facilities and schedule a range of business related and/or leisure activities (e.g., training workshops, seminars, retreats and similar type meetings). Such a facility may serve meals and offer day use and/or overnight lodging facilities.

The F-40 Zone has specific development standards identified in LUC §104-9-4, that shall be met as part of the development process. The following are minimum development standards in the F-40 zone:

Front setback: 75 feet

Side setback: 40 feet

Rear setback: 30 feet

Maximum building height (main building): 35 feet

Maximum building height (accessory building): 25 feet

Rather than proposing one conference/education center on each of the four building lots, the owner is only proposing one conference center on all four lots combined. Any buildings or structures proposed after a conditional use approval has been granted would require a conditional use permit amendment.

Conditional Use Review: A review process has been outlined in LUC §108-4-3 to ensure compliance with the applicable ordinances and to mitigate anticipated detrimental effects. Thus far, the applicant has received conditional approval from the Weber Fire District, for the proposal.

The following is an analysis of the proposal reviewed against the conditional use standards:

(1) Standards relating to safety for persons and property.

The proposal is not anticipated or expected to negatively impact this property, surrounding properties, or persons.

(2) Standards relating to infrastructure, amenities, and services.

The proposal is not anticipated or expected to negatively impact any existing infrastructure, amenities, or services in the area.

(3) Standards relating to the environment.

The proposal is not anticipated or expected to negatively impact the environment.

(4) Standards relating to the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan.

The proposal is not anticipated to substantially impact the surrounding area. As a conditional use, this operation is allowed in the F-40 Zone. With the establishment of appropriate conditions as determined by the Planning Commission, and the narrative submitted by the applicant, this operation is not anticipated to negatively impact the surrounding areas or be at odds with any of the goals and policies of the General Plan.

Design Review: The proposed conditional use mandates a design review as outlined in LUC §108-1 to ensure that the general design, layout and appearance of the building remains orderly and harmonious with the surrounding neighborhood. The matters for consideration are as follows:

Considerations relating to traffic safety and traffic congestion. The proposal includes a site plan that identifies an existing access off of River View Circle from the adjacent lot to the north. An application for an access exception, to access the lot with the existing home from a parcel boundary other than the front lot line, has been submitted to the County Planning Department. Neither traffic safety hazards nor traffic congestion are anticipated given the minimal site visitations to the substations.

Considerations relating to landscaping. The site consists of natural landscaping that meets the requirements outlined in the Architectural, Landscape, and Screening Design Standards (108-2). A small orchard and some additional agriculture area is shown on the submitted site plan.

Considerations relating to buildings and site layout. The applicant has submitted a site plan that shows a detached guesthouse (no kitchen). This is considered part of the convention/education center facilities, along with the proposed barn pavilion (**Exhibit B**). Proposed new structures shall comply with the aesthetic requirements outlined in LUC 108-2.

Review Agencies: Weber Fire District has reviewed a submitted fire suppression plan, and granted approval. Weber-Morgan Health Department has conditions to be met prior to issuing approval.

Staff Recommendation

Staff recommends approval of this conditional use permit application subject to applicant meeting the following conditions of approval in addition to any and all conditions of the various reviewing agencies and any additional conditions of the Ogden Valley Planning Commission.

Planning conditions of approval:

1) The owner shall obtain a valid Weber County Business License.
2) The owner shall obtain a conditional use permit once all recommendations of approval have been met.
3) If there is a change in use to any of the four parcels tied to this application, the owner must apply for a conditional use amendment through Weber County Planning.

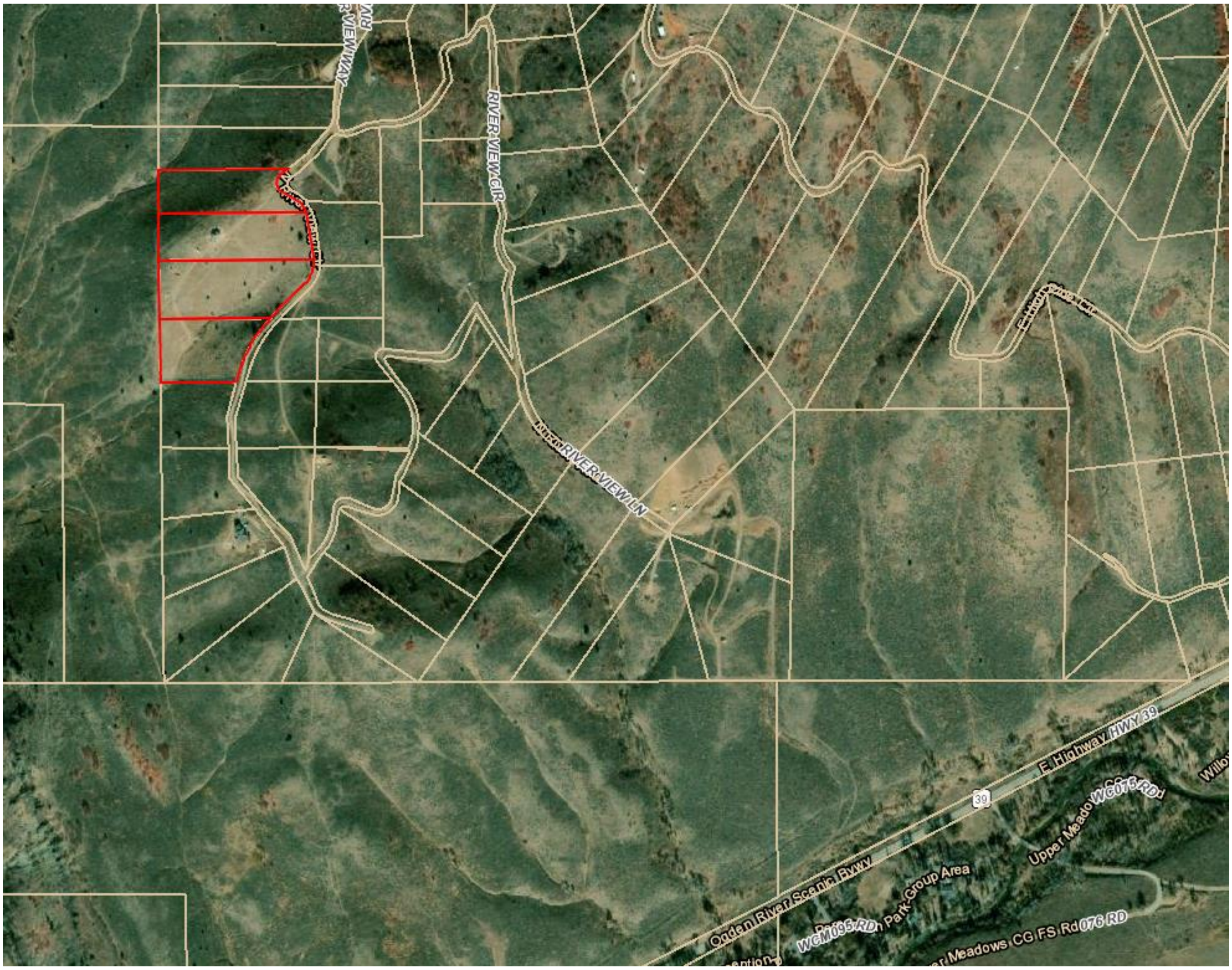
This recommendation is based on the following findings:

1) The proposed use is conditionally allowed in the F-40 Zone and meets the appropriate site development standards.
2) The criteria for issuance of a conditional use permit have been met because mitigation of potential detrimental effects can be accomplished.

Exhibits

A. Application
B. Site Plan
C. Narrative & Phasing Plan

Map 1



RIVER VIEW WAY
RIVER VIEW CIR
RIVER VIEW LN
E Highway HWY 39
39
Ogden River Scenic Bywy
Upper Meadows CG FS Rd076 RD

Exhibit A – Application

Nicolosi-Emily-Conditional Use Permits

+ Add Follower | Change Status | Edit Project

Address:	2257 N River View Rd, Huntsville, UT, 84317
Maps:	Google Maps
Project Type:	Conditional Use Permits
Sub Type:	Conditional Use Permits
Created By:	Emily Nicolosi
Created On:	2/4/2022
Project Status:	Accepted
Status Date:	2/7/2022
File Number:	CUP 2022-03
Project Manager	Tammy Aydelotte

Application | Documents 3 | Comments 1 | Reviews 2 | Followers 7 | Status | Notifications | Payments 1

Application

+ Add Building | + Add Parcel | + Add a Contractor | Edit Application | Print

Project Description

Summary Overview: We operate a small Utah nonprofit 501 (c) (3)corporation with a charitable mission to foster innovation in sustainable living and culture for present and future generations through research, practice, and education. I am a Research Professor at the University of Utah, and my husband is an engineer at a biotech company. As a part of our charitable efforts, we also focus on sustainable living and art. We envision a world where humanity is prepared for the social and environmental ramifications of climate change by having the skills and knowledge to design and implement sustainable living systems, and to flourish personally and socially in so doing. ("Nonprofit Activities"). We would like to be able to run some of our Nonprofit Activities at the Property from time to time, which is why we are seeking this Conditional Use Permit as a "conference/education center." Specifically, in the warmer months, we would like to host small groups of individuals for short stays, to learn about environmental stewardship both through sustainable living (e.g. home agriculture) and art-making. As such, our CUP application shows our home, a barn (workshop), and a small guesthouse in addition to appropriate landscaping (e.g. small agriculture, native habitat restoration) to accommodate these uses. Our vision will enhance Ogden Valley's General Plan. Through this work, we hope to act as stewards of the earth. Our impact will be minimal, with small buildings, few visitors (maximum groups of 12), only for short stays (2-7 days), a few times (2-3 stays per month) during the warmer months (April-October) and relatively quiet activities. We will enhance the natural beauty and human use of the property and area by restoring native vegetation, and enhancing rural culture. It is for these reasons that we are seeking a conditional use permit as a "conference/education center." We also intend to build our residential home on a portion of the Property. Further, we are in compliance with Section 104-9-4 of the Weber County Municipal Land Use Code ("Code").

Property Address	2257 N River View Rd Huntsville, UT, 84317
Property Owner	Emily Nicolosi 845-596-4695 emily.nicolosi@gmail.com
Representative	Emily Nicolosi 845-596-4695 emily.nicolosi@gmail.com

Accessory Dwelling Unit	False
Current Zoning	F-40
Subdivision Name	Evergreen
Number of Lots	
Lot Number	23-036-0032 - 0036
Lot Size	17.01
Frontage	30
Culinary Water Authority	Weber Basin Water Conservancy District
Secondary Water Provider	Not Applicable
Sanitary Sewer Authority	Health Department (Septic)
Nearest Hydrant Address	7118 S Sagebrush Way
Signed By	Owner, Emily Nicolosi

Parcel Number

Remove 230260034 - County Map

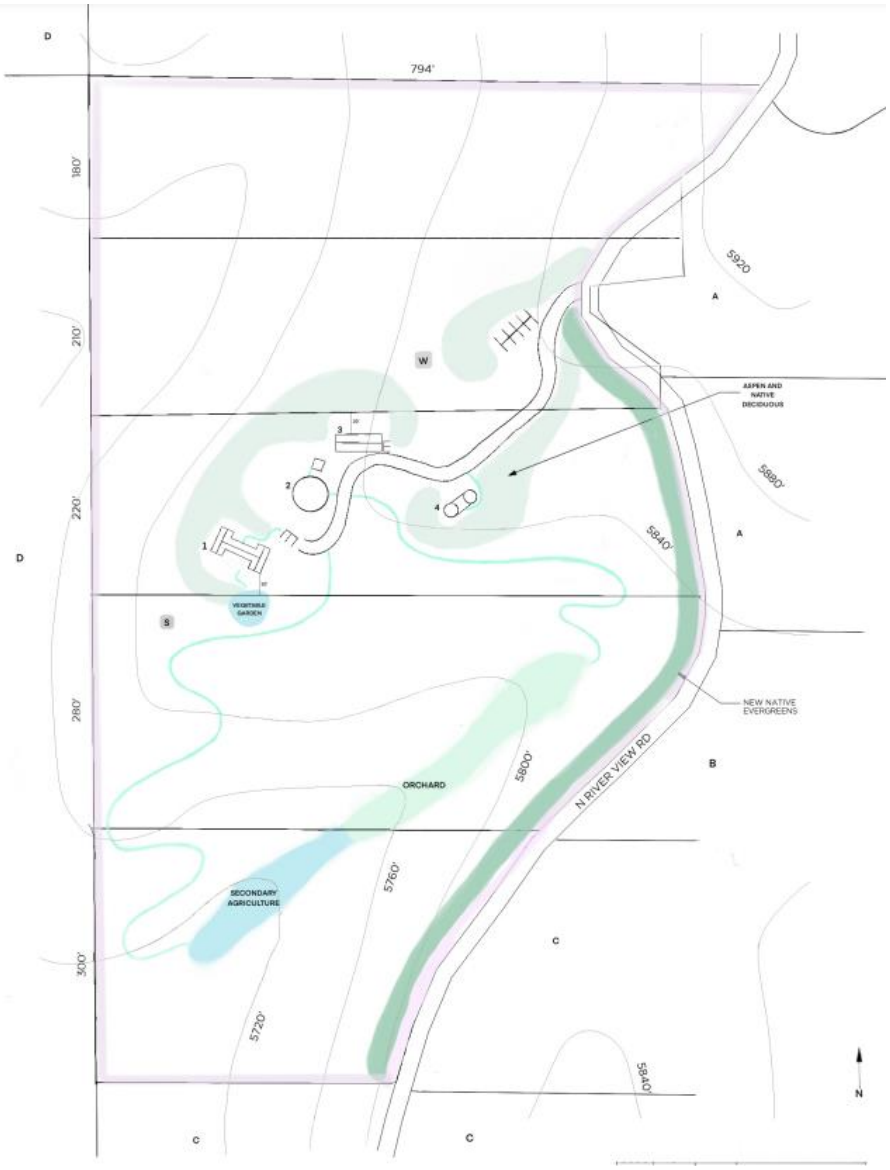
Exhibit B – Site Plan

SITE PLAN

NICOLOSI RESIDENCE/PARTIAL USE BY
THE CENTER FOR ECOLOGICAL DESIGN

IAN AND EMILY NICOLOSI
7118 SAGEBRUSH WAY
SALT LAKE CITY, UT 84121

ZONING F40
TOTAL ACREAGE 17.01



1 PRIMARY RESIDENCE
2 PAVILLION
3 BARN
4 GUEST HOUSE
SITE BOUNDARY
A MONTE L BERRET LIVING TRUST -VACANT
B THE BIG COUNTY TRUST-VACANT
C CRISTINA RUTH GRANATH LIVING TRUST - VACANT
D CORP OF PRESIDING BISHOP OF CHURCH OF JESUS CHRIST OF LDS- VACANT
PATHWAY/TRAIL
W PROPOSED WELL
S PROPOSED SEPTIC

SUPPLEMENT TO CONDITIONAL USE APPLICATION/ NICOLOSI RESIDENCE/PARTIAL USE BY THE CENTER FOR ECOLOGICAL DESIGN/ 2257 N River View Rd Huntsville UT 84317 ("Property")

3. Compliance with Section 108-4-5

Our proposal complies with the applicable standards of section 108-4-5.

- "The land use authority may apply conditions of approval related to any of the standards of this section, provided that credible evidence exists that:
  - The application of the standard is relevant to the use; and
  - The conditions are reasonable and necessary to substantially mitigate detrimental effects of the use as specified in the standard.
- The land use authority shall consider the expertise and experience of applicable reviewers and qualified professionals to help determine credible evidence, relevant standards, and reasonable conditions.
- Conditional use standards are as follows:
  - *Standards relating to safety for persons and property.*
    - Mitigate injury, loss of life, property damage, or other disproportionate demand for services on applicable fire fighting agencies." We will not use recreational outdoor fire pits or fireworks for any purposes. All tools which produce a spark (e.g. welders) will be used indoors. We will use fire prevention methodologies with our landscaping in every means possible.
    - Mitigate injury, loss of life, or other disproportionate demand for services on applicable emergency medical service agencies. We are trained in CPR and first aid. We will mitigate injury by having clear and safe standards for use of any equipment on the property.
    - Mitigate injury, loss of life, property damage, criminal activity, the need for added peace keeping activities, or other disproportionate demand for services on the county sheriff's office. Our nonprofit is focused on educational activities with groups planned to be no larger than 12 individuals. All events will be supervised by employees. Security gates will be established at all entrances. As such, the proposed use should not contribute to any disproportionate demand for services on the county sheriff's office.
    - Mitigate injury, loss of life, or property damage of any known geologic hazard or flood hazard, if credible evidence of such a detrimental effect is present. No geologic or flood hazards have been noted on property. Our construction will be minimal while preserving the natural environment. We do not intend to alter surface water and we do not believe that our construction will increase flood hazards. To our knowledge, the property does not have a history of flooding.
    - Mitigate the creation of traffic hazards and right-of-way conflicts, including mitigation of traffic hazards caused by:
      - The location, massing, size, or height of buildings, structures, and other facilities, including signage, fencing, and landscaping; None of the aforementioned will be in a place such as to cause a traffic hazard. Minimal visitation to the property, both in numbers (groups of 12 and less) and in frequency (some short stays in warmer months only) will mitigate traffic hazards. We will use clear signage for entrance and exits and provide for adequate roadways and parking. We will educate attendees as to parking locations and post signage regarding safety precautions. We will also take visitors to and from the airport, and encourage carpooling by local visitors.
      - The frequency of heavy truck traffic to and from the site (i.e. import and export of materials, deliveries, etc.) to minimize right-of-way conflicts with regular vehicle and pedestrian traffic. We do not anticipate additional heavy truck traffic to and from the site.
    - Substantially mitigate the likelihood that the proposed use or facility may cause injury or property damage to potential persons or property in the area. Nonprofit activities are unlikely to cause bodily injury or promptly damage, as they will be educational in nature, mostly involving lectures and discussions. Hands on learning will occur solely under the training and supervision of experienced individuals.
  - *Standards relating to infrastructure, amenities, and services.*
    - Mitigate undesirable vehicle or pedestrian traffic patterns or volumes. Noticeable increase in vehicle or pedestrian traffic is not anticipated. Visitors on the part of the nonprofit will be very small in number and frequency. Owners will transport visitors from airport, local visitors will be encouraged to carpool, visitors will participate in nonprofit activities on property. Minimal visitation to the property, both in numbers (groups of less than 12) and in frequency (some short stays in summer months only) will mitigate traffic hazards and not cause noticeable increases in traffic. We will use clear signage for entrance and exits and provide for adequate roadways and parking. We will educate

attendees as to parking locations and post signage regarding safety precautions. We note that undesirable vehicle volumes are currently present on the road leading to the Property due to illegal use, which we intend to help to mitigate.

- Mitigate internal vehicle or pedestrian circulation inefficiencies onsite, and provide for adequate onsite parking given the unique specificities of the proposed use or the proposed site plan. We have adequate onsite parking for proposed activities. No internal vehicle or pedestrian inefficiencies have been noted.
- Mitigate material degradation of the level of service of any street. We will provide for the improvement and maintenance of the road leading to the property. We do not anticipate noticeable increases in traffic beyond use as primary dwelling for the Nicolosi family.
- Mitigate material degradation of the level of service of any storm water drainage facility or infrastructure, and adequately provide for storm water drainage from the site. Storm water drainage facilities and infrastructures are not present. We will revegetate areas of the property which are storm water drainages and ensure they are able to properly drain.
- Mitigate material degradation of the level of service of any culinary, secondary, or irrigation water facility or infrastructure, and, if applicable, provide adequate culinary, secondary, or and irrigation water service to the site. To help determine adequacy of culinary water provisions, the land use authority may require, but are not limited to, the following as a condition of approval of the conditional use permit:
  - Written verification that the culinary water source of any new public water system can meet the requirements of the Utah Division of Drinking Water and/or the Weber Morgan Health Department; or
  - A capacity assessment letter from the Utah Division of Drinking Water for additional connections to any existing public water system; or
  - Written verification that the source of any non-public well providing culinary water for the use meets the requirements of the Weber Morgan Health Department. This verification shall be based on a test of a new or existing well. This is not applicable as we plan to only have 12 guests at a time for our nonprofit activities. We have purchased 5 acre feet of water per year from the Weber Basin Conservancy District. This water will be allocated as follows: household 0.45 acre feet/year, guest house 0.25 acre feet/year, fruit trees 0.5 acre feet/year, native revegetation 2 acre feet/year, garden 1.5 acre feet/year, sheep 0.028 acre feet/year, goats 0.028 acre feet/year, and chickens 0.0084 acre feet/year.
- Mitigate material degradation of the level of service of any sanitary sewer service, and, if applicable, provide adequate sanitary sewer service to, or septic system on, the site. We will provide sewer service (a septic system) to the site.
- Mitigate material degradation of the level of service of any other utility, and, if applicable, adequately provide such utility services to the site. Not applicable.
- Mitigate material degradation of the level of service, functionality, capacity, or usability of the existing open spaces, public features, or recreational amenities in the area, and, if applicable, adequately provide additional open spaces, public features, or recreational amenities. We will not degrade open spaces, public features, or recreational amenities in the area, but rather will contribute to them. Our plans include over 99% preservation of open space on our property. We invite all members of the public to participate in our nonprofit activities. We will provide recreational amenities in the form of participation in art-making, educational activities around sustainable living, and enjoyment of nature on our property.
- Mitigate any disproportionate demand for government services, generally. We do not anticipate any disproportionate demand for government services generally. There will be minimal use of governmental services, as we are proposing to host a very small numbers of individuals and infrequently.

- *Standards relating to the environment.*
  - Mitigate detrimental effects on the natural features of the site, and the surrounding affected areas, if credible evidence of such a detrimental effect is present; including, but not limited to, rivers and creeks, lakes, ponds, reservoirs, wetlands, drainage ways, groundwater protection, and slopes. We will not have a detrimental impact on the environment. We are only developing 1% of the land area of the property. There are no rivers, creeks, lakes, ponds, reservoirs, wetlands, there is a storm water drainage, which we will not develop, nor use for animal husbandry. We will help to restore native flora that are non invasive and require low water use, which will result in positive impacts for habitat and beautification, and will aid in groundwater retention and absorption.
  - Mitigate detrimental effects on the natural environment of the site, and the surrounding affected areas, if credible evidence of such a detrimental effect is present; including, but not limited to,

wildlife, air quality, water quality (including erosion control), local natural resources, natural vegetation (including protection against noxious or invasive species), and wildland areas. We will not have a detrimental effect of the natural environment of the site or the surrounding affected areas, but rather the opposite. We plan to improve and restore native vegetation to aid in wildlife habitation and erosion control, use solar energy to aid in air quality, remove invasive species, and leave most of property as wild land areas (99% of the property will not be developed).

- *Standards relating to the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan.*
  - Provide buffering, screening, or fencing of the use or site, or provide other landscape features, sufficient to mitigate the proximity of incompatible uses, objectionable site features, and disharmony with existing and future land uses in the area. Buffering and screening with native trees will be used to screen all buildings, and will screen the perimeter with the road. Landscape features (native flora restoration, orchard, and vegetable garden) and all design (natural buildings) for the site is compatible and in fact contributes to the beautiful rural mountain setting of the area.
  - Provide hours of operation appropriate for the general nature and character of existing land uses in the area to mitigate conflict or incompatibility with surrounding uses. Nonprofit activities will be minimal in nature, there are no open hours of operation for general public, thus conflict with surrounding uses for this reason is not anticipated. Anticipated hours for nonprofit activities, by reservation only for retreats, will be during several 2-7 day retreats May-October, 9-6pm.
  - Provide reclamation, restoration, cleanup, or beautification of the site as the use evolves, or as the use is terminated, in order to mitigate aesthetic and nuisance effects. We plan to restore and beautify the site from previous uses. Much of the site has been overgrazed and stripped of native flora (so much so that the scarring is visible via satellite). We plan to restore these areas. Additionally, we plan to beautify the site with native gardens, and groves of native tree species.
  - Mitigate nuisance factors, including, but not limited to, light and glare, noise, vibrations, smoke, dust, dirt, odors, gases, noxious matter, heat, electromagnetic disturbances, and radiation, if credible evidence of such a nuisance is present. We do not anticipate to produce such nuisances. All use of tools and equipment (saws, welders, et cetera) will be inside of our highly insulated (thus dampening all sound, light, vibrations, odors, et cetera) workspace. We will only use indoor lighting at night, and to screen all buildings with vegetation such that the lights through the windows are not visible.
  - Mitigate detrimental effects of the use considering the combined effect of it and other main uses on the property. We do not anticipate detrimental effects in accordance with the general plan, but rather to contribute to the vision for Ogden Valley.
  - To the extent supported by law, mitigate other general detrimental effects in a manner that sustains the objectives and intentions of the county's general plan https://www.webercountyutah.gov/planning/documents/Ogden%20Valley%20General%20Plan,%20Updated%20Nov%2019,%202019.pdf , future land use map (or proposed land use map), and this Land Use Code. We do not anticipate to produce detrimental effects in regards to the counties general plan or the Land Use code, but rather to contribute to the vision of Ogden Valleys General Plan, enumerated here. General plan:
    - "Gateways and Viewsheds" Our plans do not impact gateways and viewsheds.
    - "Open Space and Agriculture" We will preserve 99% of the land as open space. We will have small agriculture, contributing to the rural character of the Valley.
    - "Wildlife" Our plans will support wildlife through native habitat restoration.
    - "Clean Air and Water" Our focus on environmental sustainability as a nonprofit will serve to enhance water and air quality in the Ogden Valley.
    - "Dark Sky Preservation" Our operations will be during daylight hours and consistent with Dark Sky Preservation.
    - "Historic Preservation" We will contribute to historic character of Ogden Valley by reflecting its architectural traditions.

    Future land use map: we could not find a future land use map for the relevant area. Land use code: "Conference/education" centers are listed as a Conditional Use in the F-40 zone.

- Standards relating to performance.
  - Mitigate potential **noncompliance or poor performance** by providing appropriate **performance measures,** including, but not limited to, completion or performance bonds, completion agreements, and development agreements. We have very achievable goals as we are looking at very minimal activities as per this application, thus we do not anticipate noncompliance or poor performance.
  - Mitigate potential noncompliance or poor performance by requiring regular **review or monitoring** of certain specified detrimental effects by an appropriately qualified professional. Not applicable.

- *Standards generally.*
  - Mitigate **unsustainable effects on the economy** of the surrounding area or county, generally, if credible evidence of such negative effects is present. None present.
  - Provide appropriate **mitigation of detrimental effects** as required in standards found elsewhere in this Land Use Code in a manner that complies with this Land Use Code, and any other federal, state, or local regulation, as may be applicable. None present.

Phasing Plan:

Phase 1: Educational activities, ranging from 1 hour to full day. No nighttime stays, no food provided (guesthouse and kitchen not yet built)

Phase 2: Educational activities, day and overnight, no food provided (guesthouse built, kitchen not yet built)

Phase 3: Educational activities, day and overnight, food provided (guesthouse and kitchen built).

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Consideration and action on preliminary approval of Bright Acres Subdivision, consisting of four lots.
Type of Decision:	Administrative
Agenda Date:	Tuesday, May 24, 2022
Applicant:	Scott Hale, Owner
File Number:	UVB04042022

Property Information

Approximate Address:	5638 N 3100 E, Liberty, UT, 84310
Project Area:	14.06 acres
Zoning:	Agricultural Valley (AV-3)
Existing Land Use:	Agriculture
Proposed Land Use:	Residential
Parcel ID:	22-280-0001, 22-004-0173 , 22-004-0174
Township, Range, Section:	T7N, R1E, Section 07 NE

Adjacent Land Use

North:	Park Rd./5750 North St.	**South:**	Residential/Vacant
East:	Residential/3100 East St.	**West:**	Residential

Staff Information

Report Presenter:	Tammy Aydelotte taydelotte@webercountyutah.gov
Report Reviewer:	SB

Applicable Land Use Codes

- Weber County Land Use Code Title 106 (Subdivisions)
- Weber County Land Use Code Title 104 (Stream corridors, wetlands, shorelines)
- Weber County Land Use Code Title 104 (Zones) Chapter 2 (AV-3 Zone)

Background and Summary

An alternative access request was previously approved on 9/6/2021 (file no. AAE2021-10 – Exhibit D). This alternative access approval allows the owner to have a private access easement to two of the four lots. The owner will be required to record a covenant with the subdivision plat, where the owner agrees to dedicate to the county and improve the access easement at the time the county so requests. As part of this approval, connectivity is required to be shown at subdivision, either a public road stub or a public pathway easement, per LUC § 106-2.

The applicant is requesting preliminary approval of Bright Acres Subdivision, a single-phase subdivision consisting of four lots, in the AV-3 Zone. The proposed subdivision and lot configuration are in conformance with the applicable zoning and subdivision requirements as required by the Uniform Land Use Code of Weber County (LUC). The following is a brief synopsis of the review criteria and conformance with LUC.

Analysis

General Plan: The request is in conformance with the Ogden Valley General Plan, as the property is being platted under the existing 3 acre zoning.

Zoning: The subject property is located in the AV-3 Zone. Single-family dwellings are a permitted use in the AV-3 Zone.

Lot area, frontage/width and yard regulations: The AV-3 zone requires a minimum lot area of 3 acres for a single family dwelling and a minimum lot width of 150 feet. This subdivision is a lot-averaged subdivision. Per LUC § 106-2-4.2 the minimum lot area and width in the AV-3 zone within a lot averaged subdivision is 40,000 square feet in area and 100 feet in width. This subdivision has an approved access exception dated September 6, 2021.

As part of the subdivision process, the proposal has been reviewed for compliance with the current subdivision ordinance in the LUC § 106-1, and the AV-3 zone standards in LUC § 104-2. The proposed subdivision will involve road dedication along 5750 North Street, 3100 East Street, and an approved access exception in order to access lots 2, 3, and 4.

Culinary water and sanitary sewage disposal: Two well permits, located on lots 1 and 2, have been issued by Weber Morgan Health Department, in response to a requested Order of the State Engineer. Lot one will have a well to supply lot one with culinary water and sufficient secondary water to irrigate 30% of lot 1. Lot 2 will have the shared well providing culinary water for lots 2, 3, and 4. There will be sufficient water from this well to irrigate 30% of lots 2, 3, and 4. Weber-Morgan Health Department has also issued design requirements for on-site septic systems for each lot.

Secondary water by private well. Secondary water will be provided by a private well, then by default, a water allocation sufficient to water 30 percent of the lot is required unless specifically provided otherwise herein. Weber-Morgan Health Department has verified there is sufficient water to irrigate 30% of each lot. This percent shall be increased to the actual area watered if more than 30 percent of the lot is or will be watered. This percent may be reduced to the actual percentage of the lot covered by vegetation that is not drought-tolerant or non-native wildland if:

1. All areas with drought-tolerant vegetation are provided sufficient water allocation for the vegetation type and an automatic watering system is installed that has separate valves and stations on which vegetation with similar watering needs shall be grouped, if applicable;
2. A restricted-landscape covenant is recorded to the lot that restricts the area of non-drought tolerant vegetation to the actual area allowed by the lot's water allocation, water rights, or water shares, given the water duty for crop irrigation as prescribed by the Utah Division of Water Rights, and specifies the automatic watering system requirements herein, if applicable;
3. A note is placed on the final recorded plat as required in Section 106-1-8.2; and
4. The approved Exchange Application from the Utah Division of Water Rights is submitted to the County for each well. It shall demonstrate the total acre-feet approved for each well, and demonstrate that all proposed wells within the subdivision, including all phases, were simultaneously submitted to the division for approval.

Natural hazards/wetlands: Per LUC § 108-22-3, a geologic hazard survey has been submitted. This proposed subdivision is not located within an important wildlife habitat area, nor are there any sensitive lands located within the proposed subdivision boundaries.

The proposed subdivision lies within, or near a designated flood zone (FEMA Zone AE). Further reports have not been required from Engineering at this time. Engineering has confirmed that these areas do not lie within the subdivision boundary.

Review Agencies: To date, the proposed subdivision has been reviewed by the Planning Division, Engineering Division, and Surveyor's Office along with the Weber Fire District. County Engineering has not yet issued approval for this subdivision. County Surveyor has not yet approved the plat for this subdivision. Weber Fire has issued approval with a hydrant installed between lots 3 and 4. All review agency requirements must be addressed and completed prior to this subdivision being recorded.

Tax Clearance: There are no outstanding tax payments related to these parcels. The 2022 property taxes are not considered due at this time, but will become due in full on November 30, 2022.

Staff Recommendation

Staff recommends preliminary approval of Bright Acres Subdivision, consisting of four lots located at approximately 5638 N 3100 E, Liberty. This recommendation is subject to all review agency requirements prior to recording of the subdivision, and the following conditions:

1. A 12-foot wide public trail easement shall be shown on the final plat along the southern boundary of lots 3 and 4, per the approval of the application for AAE2021-10
2. The proposed access shall comply with safety, design, and parcel/lot standards as outlined in LUC, and will be verified prior to issuing certificate of occupancy for the first residence within this subdivision.
3. An alternative access covenant, per the approval for an alternative access dated 10/28/2020, shall be recorded with the final plat.
4. An onsite wastewater disposal covenant shall be recorded with the final plat
5. A private well covenant shall be recorded with the final plat.

6. A covenant, specifying the allowed amount of non-drought tolerant landscaping, shall be recorded with the final plat.
7. A table shall be provided with the subdivision application and on the final subdivision plat showing the area and width of each lot within the overall subdivision boundary, the average area and width of all lots within the overall subdivision boundary,

This recommendation is based on the following findings:

1. The proposed subdivision conforms to the Ogden Valley General Plan
2. The proposed subdivision complies with applicable county ordinances

Exhibits

A. Application
B. Subdivision Plat
C. Well Permits & Septic Feasibility
D. Access Exception Notice of Decision

Area Map

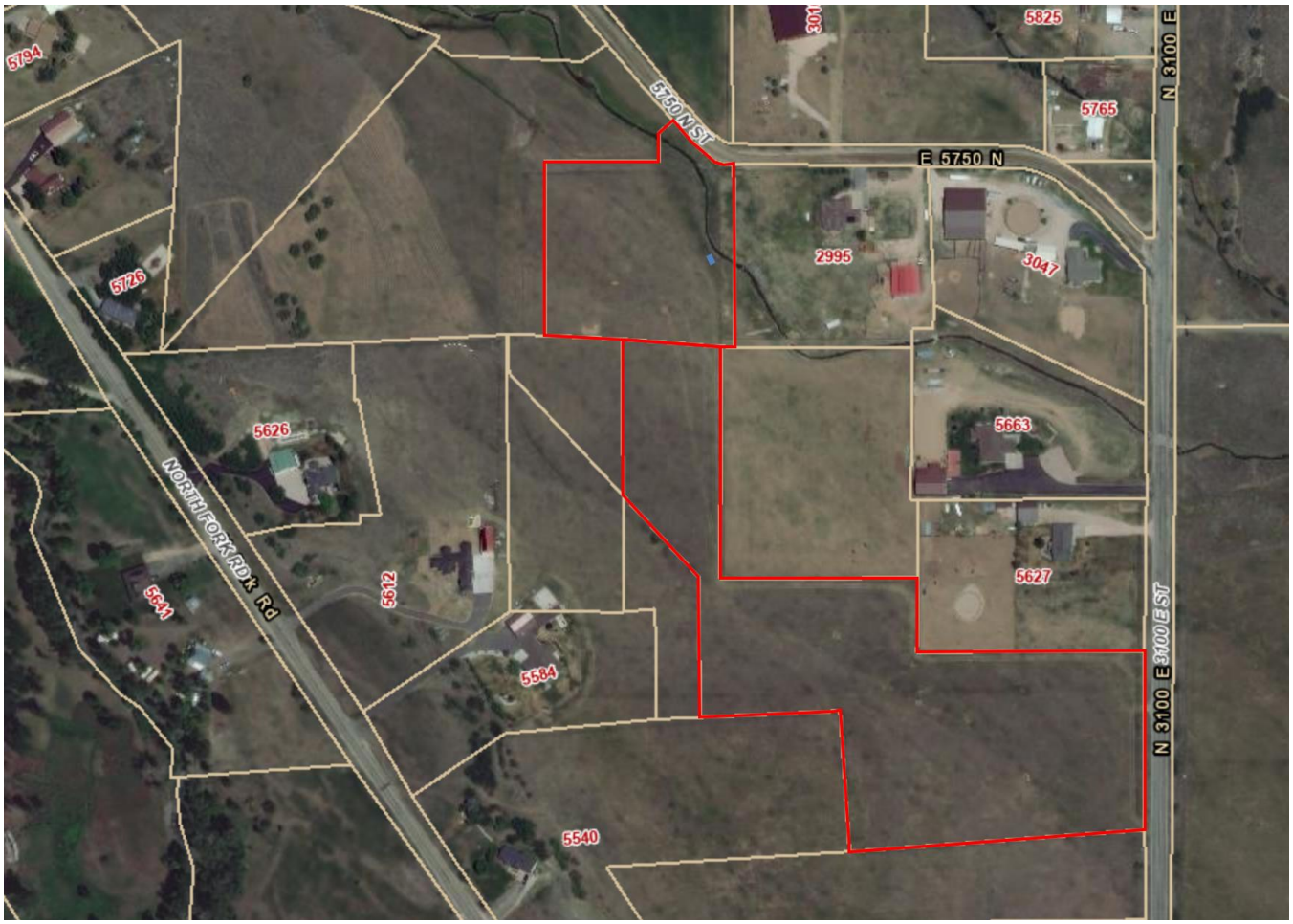


Exhibit A – Application

Bright Acres Subdivision

+ Add Follower | Change Status | Edit Project

Address:	5638 N 3100 E, Liberty, UT, 84310
Maps:	Google Maps
Project Type:	Subdivisions
Sub Type:	Subdivisions
Created By:	Scott Hale
Created On:	3/9/2022
Project Status:	Accepted
Status Date:	4/4/2022
File Number:	UVB04042022
Project Manager	Tammy Aydelotte

Application | Documents 13 | Comments 2 | Reviews 4 | Followers 11 | Status | Notifications | Payments 1

Application

+ Add Building | + Add Parcel | + Add a Contractor | Edit Application | Print

Project Description	Bright Acres Subdivision - a four residential lot subdivision on a 14 acre parcel in Liberty, Utah. The approval for access to lots 3 and 4 via a private access easement is found in AAE 2021-10 Staff Report in file AAE 2021-02. Culinary and secondary water for the subdivision to be provided via two wells that have been drilled, tested, and approved by Weber-Morgan Health Department.
Property Address	5638 N 3100 E Liberty, UT, 84310
Property Owner	Scott Hale 801-792-4065 scottchale@gmail.com
Representative	--

Accessory Dwelling Unit	False
Current Zoning	AV-3
Subdivision Name	Bright Acres
Number of Lots	
Lot Number	4
Lot Size	Average of 3.5 Acres per lot
Frontage	506'
Culinary Water Authority	Health Department (Well)
Secondary Water Provider	Not Applicable
Sanitary Sewer Authority	Health Department (Septic)
Nearest Hydrant Address	2995 E 5750 N, LIBERTY UT 84310 and 5627 N 3100 E, LIBERTY UT 84310
Signed By	Owner, Scott Hale

Parcel Number

- Remove 222800001 - County Map
- Remove 220040174 - County Map
- Remove 220040173 - County Map

Exhibit B– Subdivision Plat

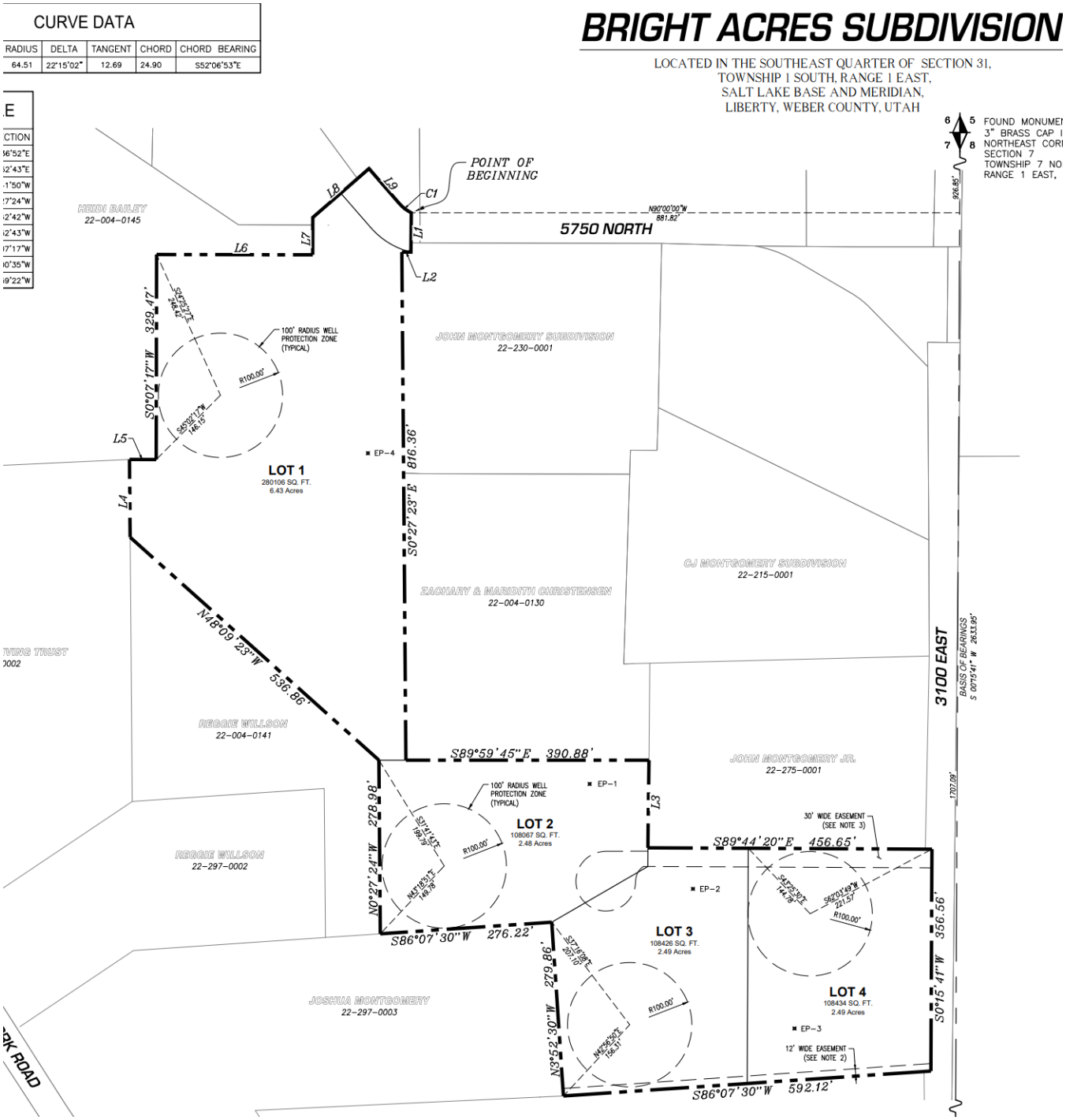


Exhibit C – Well Permits/Septic Feasibility

Well permits - See attached.

BRIAN COWAN, MPH, LEHS
Health Officer/Executive Director

WEBER-MORGAN HEALTH DEPARTMENT

October 7, 2021

Mozanaim LLC
983 E Bella Vista Dr
Fruit Hieghts, UT 84037

RE: **Private Well Approval at**:
5750 N 2955 E Lot 1
Liberty, UT 84310
Parcel #22-280-0001

The application for approval of the above referenced well has been submitted for review to determine conformance to the Weber-Morgan District Health Department Regulations for Installation and Approval of Nonpublic Water System Serving 1-14 Connections.

The following have been submitted:

1. The Water Right Number: E6121 (35-13833)
2. Well driller license #920
3. The well is 205 feet deep with a "Bentonite Chip 3/8"" seal to a depth of 30 feet.
4. The well yields 40 GPM with a 0-foot drawdown in 6.5 hrs.
5. The water samples for the partial inorganic analysis were submitted to Chemtech-Ford Laboratories on September 29, 2021. The water analysis was satisfactory.
6. A bacteriological water sample was collected by staff of this department on September 29, 2021.September 29, 2021 The water analysis was satisfactory.
7. This is not a shared well.

The required 100-foot protection zone around the well must be kept free from any septic tank absorption systems, garbage dumps, hazardous and toxic material storage or disposal sites, feedlots and other concentrated sources of pollution. We would recommend that a bacteriological sample be collected and submitted for analysis on an annual basis.

Based on compliance with the above requirements, the Health Department considers this an approved well for culinary purposes.

Please contact our office at (801) 399-7160 if you have further questions.

Sincerely,

Summer Day, LEHS III, Program Manager
Division of Environmental Health

Memo

Bright Acres Subdivision culinary and secondary water

Date: April 1, 2022

Regarding: Summary of culinary and secondary water obtained for use on Lots 1, 2, 3 and 4 of the Bright Acres Subdivision

Applicant: Scott and Rachel Hale, 796 Sunrise Circle Centerville, Utah 84014, 801-792-4065, Scottchale@gmail.com

To: Weber County Planning Department, 2380 Washington Boulevard, Suite 240, Ogden Utah, 84410

The Bright Acres Subdivision is a proposed 4 Lot subdivision on three adjoining parcels of land in Liberty, Utah totaling 14 acres.

The culinary and secondary water for the four lots in the subdivision will be provided via two private wells. The Well located on proposed Lot 1 will provide culinary and secondary water for Lot 1. The Shared Well located on Lot 2 will provide culinary and secondar water for Lots 2, 3, and 4. The wells have been approved by the state of Utah, have been drilled, and are both good producing wells. Both wells have been tested and approved by Weber-Morgan Health Department (refer to Morgan Health Department Well Approval for approval for the Well on Lot 1 and Morgan Health Department Private Shared Well Approval for Lots 2, 3 and 4.pdf for approval for the Shared Well on Lot 2 under the Well Approval Section in Frontier). Water allocations from Weber Basis Water Conservancy District sufficient to water 30 percent of each lot in the subdivision have been secured in accordance with **Sec 106-4-2.1 - Water Supply.**

BRIAN COWAN, MPH, LEHS
Health Officer/Executive Director

WEBER-MORGAN
HEALTH DEPARTMENT

July 26, 2021

Weber County Planning Commission
2380 Washington Blvd.
Ogden, UT 84401

RE: Preliminary Subdivision **Determination**
Bright Acres Subdivision, 4 lots
Parcel #22-004-0142 & 22-280-0001
Soil log #15198

Gentlemen:

The soil and percolation information for the above-referenced lot have been reviewed. Culinary water will be provided by a private well. **The placement of the well is critical so as to provide the required 100 foot protection zone.** The well will need to be dug, tested and the water supply approved prior to issuance of a wastewater disposal permit.

DESIGN REQUIREMENTS
Lot 1-4: Documented ground water tables not to exceed 48 inches, fall within the range of acceptability for the utilization of a Conventional Wastewater Disposal System as a means of wastewater disposal. Maximum trench depth is limited to 18 inches. The absorption system is to be designed using a maximum loading rate of 0.45 gal/sq. ft. /day as required for a gravelly sandy loam, massive structure soil horizon.

Plans for the construction of any wastewater disposal system are to be prepared by a Utah State certified individual and submitted to this office for review prior to the issuance of a Wastewater Disposal permit.

The following items are required for a formal **subdivision review**; application, receipt of the appropriate fee, and a full sized copy of the subdivision plats showing the location of exploration pits and percolation tests as well as the documented soil horizons and percolation rates. A subdivision review will not occur until all items are submitted. Mylars submitted for signature without this information will be returned

Each on-site individual wastewater disposal system must be installed in accordance with R317-4, Utah Administrative Code, Individual Wastewater Disposal Systems and Weber-Morgan District Health Department Rules. Final approval will be given only after an on-site inspection of the completed project and prior to the accomplishment of any backfilling.

Please be advised that the conditions of this letter are valid for a period of 18 months. At that time the site will be re-evaluated in relation to rules in effect at that time.

Sincerely,

Craig Jorgensen, LEHS
Environmental Health Division
801-399-7160

Exhibit D – Access Exception Notice of Decision

Weber County Planning Division
www.co.weber.ut.us/planning_commission
2380 Washington Blvd., Suite 240
Ogden, Utah 84401-1473
Voice: (801) 399-8371
Fax: (801) 399-8862

Weber County Planning Division
NOTICE OF DECISION

September 7, 2021

Scott Hale
5638 N 3100 E
Liberty, UT 84310

You are hereby notified that your application for an Alternative Access Exemption, located on Parcel ID 22-004-0142 was heard and conditionally approved by the Weber County Planning Division in a public meeting held on September 6, 2021. Conditional approval was granted upon meeting all requirements from county reviewing agencies and the following conditions:

1. The private access shall comply with the design, safety, and parcel/lot standards, as outlined in LUC §108-7-29.
2. The applicant shall agree to file the required alternative access covenant, as outlined in LUC §108-7-31, before the recording of the future subdivision.
3. The development plan display connectivity via a public road stub or public pathway stub.
4. The improved travel surface of the access easement shall be a minimum of 12 feet wide and shall be capable of supporting 75,000 lbs. Also, and Per LUC Sec. 108-7-29(a)(5), a turnout measuring 10'x40' will be required at the midpoint of the access easement.

108-7-29 (d) *Expiration.* Flag lot access strips, private rights-of-way, and access easements which have been approved by the land use authority are valid for 18 months from the date of approval.

Felix Lleverino
Weber County Planning Division

GCS Geoscience

Report Professional Geologist Site Reconnaissance and Review
Proposed Liberty 14.02 Acre Subdivision Parcel
Parcel #22-004-0142 (10.83-Ac.), 5638 N. 3100 East Street
Parcel #22-280-0001 (3.19-Ac.), 2955 E. 5750 North Street
Liberty, Weber County, Utah

For:

Scott and Rachel Hale
983 E. Bella Vista Drive
Fruit Heights, Utah
84037

By:

GCS Geoscience
554 South 7700 East Street
Huntsville, Utah 84317

December 22, 2020
GCS File No: 2020.73

GCS Geoscience

554 South 7700 East Street
Huntsville, Utah 84317
d| 801 745 0262
m| 801 458 0207

December 22, 2020
File No: 2020.73

Scott and Rachel Hale
983 E. Bella Vista Drive
Fruit Heights, Utah
84037

Attn: Scott and Rachel Hale

Subject: Report
Professional Geologist Site Reconnaissance and Review Services
Proposed Liberty 14.02 Acre Subdivision Parcel
Parcel #22-004-0142 (10.83-Ac.), 5638 N. 3100 East Street
Parcel #22-280-0001 (3.19-Ac.), 2955 E. 5750 North Street
Liberty, Weber County, Utah

INTRODUCTION

In response to your request, GCS Geoscience (GCS) has prepared this Professional Geologist site reconnaissance review report for the above referenced site. The 14.02-Acre Proposed Subdivision Parcel consists of two contiguous property parcels, 10.83-acres, and 3.19-acres, that are proposed to be combined and subdivided into two or more single-family residential development lots. The proposed subdivision property is located in the Liberty Area in Weber County, Utah, as shown on attached Figure 1. Figure 2 provides aerial coverage of the site and detail of the current (2018) layout of the site vicinity.

The property is presently open and undeveloped and appears to presently be used for agricultural purposes. The subject properties and surrounding properties are zoned by Weber County as Agricultural Valley AV-3 (Agricultural Valley Zone - 3) land-use zone. According to the Weber County Code of Ordinances the purpose of *the Agricultural Valley AV-3 Zone is to designate farm areas, which are likely to undergo a more intensive urban development, to set up guidelines to continue agricultural pursuits, including the keeping of farm animals, and to direct orderly low-density residential development in a continuing rural environment.*

The prescribed minimum building lot area in the AV-3 Zone is three acres (excluding cluster provision areas), with single family residences included as a permitted use.

It is our understanding that you are proposing to combine and subdivide the properties into two or more single-family residential homesite lots. We expect that the proposed construction will consist of a single-family residence structures, likely to be constructed

with a basement level and supported on conventional spread and strip footings. Above grade levels will consist of wood frame construction one to three levels in height. Projected site grading is anticipated to consist primarily of cutting into the existing ground to construct the residences and roadways, with very little fill projected for the site.

Because the proposed subdivision site appears to be located in part on a hillslope area in the vicinity of mapped landslide hazards, marginal soils, Quaternary faults and FEMA floodplain areas, Weber County is requesting that a geological site reconnaissance be performed to assess whether all or parts of the site are exposed to the hazards that are included in the Weber County Code, Section 108-22 Natural Hazard Areas. These hazards include, but are not limited to: Surface-Fault Ruptures, Landslide, Tectonic Subsidence, Rock Fall, Debris Flows, Liquefaction Areas, Flood, or other Hazardous Areas.

Scope of Work

The purpose of this **Professional Geologist Site Reconnaissance Review** is to evaluate if the proposed development is outside or within areas identified as Natural Hazards Overlay District, and if within a hazard area, to recommend appropriate additional studies that comply with the purpose and intent of the Weber County Natural Hazards Area guidelines and standards in order to be "cleared" for building permit issuance by the county, as outlined by the Weber County Development Process packet as provided by the Weber County Building Inspection Department.

The objectives and scope of this study were presented Scott and Rachel Hale (Clients) in our (GCS) Proposal-Agreement dated December 5, 2020, and was returned signed December 7, 2020 by Scott Hale.

LITERATURE AND RESOURCE REVIEW

To evaluate the potential exposure of sites to geological hazards that impact sites or site improvements, Weber County has compiled a series of Geographic Information Systems (GIS) data mapping layers of geological hazard related information. These data may be queried on-line using the Weber County Geo-Gizmo web server application at:

http://www.co.weber.ut.us/gis/maps/gizmo/.

Using the Geo-Gizmo application, under the Engineering Layers category, is listed geological hazard related layers that may be toggled on and off to determine potential hazards exposure to sites in the county. These mapping layers include the following categories; *Quake Epicenters, FEMA Flood Zone Line, FEMA Base Flood Elevation, Wasatch Faults, Landslide Scarps, Geologic Faults, Faults, Quaternary Faults, FEMA Flood Zone, FEMA LOMR, Engineering Problems; Liquefaction Potential, Landslide, FEMA Letters of Map Change, and FEMA Flood Zones.* These layers have been compiled from the respective agencies including the Federal Emergency Management Agency (FEMA), the Utah Geological Survey (UGS), and the U.S. Geological Survey

(USGS). These mapping layers consist of regional compilation hazards data but are not compiled at scales that are necessarily applicable for site specific usage and planning. When hazard layer data on the Geo-Gizmo are found to overlay with Permit Applicant site improvement locations, Weber County Engineers and Planners will request that the Permit Applicant have a Professional Geologist Site Reconnaissance Review, such as presented herein, conducted for the site.

In addition to the Geo-Gizmo site screening, the Weber County Engineers and Planners rely on published UGS geological mapping (Coogan and King, 2016), that includes much of Weber County for determining if a site is located upon a potentially hazardous geological mapping unit, thus requiring a geological reconnaissance. This interactive "Weber County Geologic Map" may be viewed on-line at:

https://weber.maps.arcgis.com/apps/webappviewer/index.html?id=bd557ebafc0e4ed58471342bb03fdac5

Our preliminary review of the Geo-Gizmo found no areas of concern for the proposed subdivision location.

Our review of the Weber County Geologic Map indicated that the site is located upon a geological mapping units designated as ***Qac***- *Mixed deposits…(Holocene and Pleistocene),* **Qa2/Qafp?** - Alluvial deposits…*(Holocene and Pleistocene), and* **Qab - Qapb** - Alluvial deposits…(upper Pleistocene); these are mapping units that have been found related to geologic hazard processes in Weber county, thus requiring this reconnaissance and review.

Our site-specific review consisted of a GIS data integration effort that included:

1. Reviews of previous mapping and literature pertaining to site and regional geology including and Sorensen and Crittenden (1979), Mulvey (1992), USGS and UGS (2016), Elliott and Harty (2010), King and McDonald (2014), and Coogan and King (2016).

2. An analysis of vertical and stereoscopic aerial photography for the site including a 1963 1:15,840 scale stereoscopic sequence, 2012 5.0 inch digital HRO orthoimagery coverage, and 2014 1.0 meter digital NAIP orthoimagery coverage of the site.

3. A GIS analysis using the QGIS® GIS platform to geoprocess and analyze 2011 1.0 meter LiDAR digital elevation data made available for the site by the Utah Automated Geographic Reference Center (AGRC). The GIS analysis included using the QGIS® platform Geospatial Data Abstraction Library (GDAL, 2013) Contour; the GRASS® (Geographic Resources Analysis Support System, 2013) r.slope and r.shaded.relief modules.

For the best site-specific documentation for this review we relied on geologic mapping by Coogan and King (2016), which provided the most up-to-date rendering of geological mapping for the site location. Supporting documentation by King and McDonald (2014), Sorensen and Crittenden (1979), and FEMA (2015) was also used to support this review. The geological mapping for this review is provided on Figure 3, Geologic Mapping. Topographic, slope, and elevation data for this review was supported through the aforementioned LiDAR analysis which is presented on Figure 4, LiDAR Analysis.

REVIEW FINDINGS

The site is located in Ogden Valley on the eastern flank of Chilly Peak. The valley is a northwest trending fault bounded graben structure, with the Wasatch Range comprising the western flank of the valley and the Bear River Range the eastern flank (Avery, 1995). Chilly Peak is located approximately 2.8 miles west of the site, and stands 8620 feet in elevation. Topographically the site is located on older (ancestral) valley floodplains of the North Fork of the Ogden River, which is presently located over 800 feet to the west of the site. The elevation of the site surface ranges between approximately 5256 feet on the southeast side of the site, and 5288 feet on the west side of the site as shown on Figure 4. For the most part, the surface of the site is formed upon lacustrine and alluvial sediments that were deposited during the transgression and regression of Lake Bonneville between 19,000 to 15,000 years ago (Currey and Oviatt, 1985). An unnamed drainage crosses on the very north of the site. The water from this drainage originates from emergent springs on slopes to the north of the site

Geological Mapping: Figure 3 shows the location of the site relative to GIS overlays including geological mapping drawn from Coogan and King (2016). A summary of the geological mapping of the site vicinity, as paraphrased from Coogan and King (2016), is provided as follows:

> **Qal –** Alluvial deposits (mostly Holocene). Moderately sorted, unconsolidated sand, silt, clay, and gravel; locally includes muddy, organic overbank and oxbow lake deposits...
>
> **Qay – Qa2 -** Younger alluvium (mostly Holocene) – Like undivided alluvium, with **Qay** and **Qa2** at to slightly above present drainages, unconsolidated, and not incised by active drainages; likely mostly Holocene in age and postdates late Pleistocene Provo shoreline of Lake Bonneville...
>
> **Qac -** Alluvial and colluvial deposits, (Holocene and Pleistocene) Unsorted to variably sorted gravel, sand, silt, and clay in variable proportions; typically mapped along smaller drainages that lack flat bottoms; includes stream and fan alluvium...
>
> **Qafy -** Alluvial-fan deposits (Holocene and Pleistocene) – Mostly sand, silt, and gravel that is poorly bedded and poorly...

Qmc - Landslide and colluvial deposits, undivided (Holocene and Pleistocene) – Poorly sorted to unsorted clay- to boulder-sized material...(slopewash and soil creep)...These deposits are as unstable as other landslide units...

Qms - Landslide deposits (Holocene and upper and middle? Pleistocene) – Poorly sorted clay- to boulder sized material; includes slides, slumps, and locally flows and floods...

Qalp? - Lake Bonneville regression-age stream alluvium (upper Pleistocene?) – Pebble and cobble gravel, gravelly sand and silty sand, with minor clay in channel incised into Lake Bonneville deltaic and lacustrine deposits...

Qab - Qapb - Lake Bonneville-age alluvium (upper Pleistocene) – Related to shorelines of Lake Bonneville, Sand, silt, clay, and gravel in channels, flood plains, and terraces, unconsolidated to weakly consolidated alluvium...

Qa2/Qafp? - Younger alluvium (mostly Holocene) **Qa2** over **Qafp?** Lake Bonneville-age alluvial-fan deposits (upper Pleistocene) —- Related to shorelines of Lake Bonneville, mostly sand, silt, and gravel that is poorly bedded and poorly sorted...

Tn – Norwood Formation (lower Oligocene and upper Eocene) – Typically light-gray to light-brown altered tuff (claystone), altered tuffaceous siltstone and sandstone, and conglomerate...

Zkc - Kelley Canyon Formation (Neoproterozoic) – Dark-gray to black, gray to olive-gray-weathering argillite to phyllite, with rare metacarbonate...The Kelley Canyon Formation is prone to slope failures...

In summary, the site vicinity is bounded on the east and west by eastward thrusted Precambrian and Paleozoic rocks (Sorensen and Crittenden, 1979), which form the mountains, with the valley forming as a fault bounded graben structure (Avery, 1995). Most recently, in the past 19,000 to 15,000 years ancient Lake Bonneville inundated parts of Ogden Valley (Currey and Oviatt, 1985), leaving transgressional lake bed and related recessional alluvial deposits (**Qab – Qapb**, and **Qafp?**) on the site with remnant (**Qa2**), alluvium covering the ancient recessional alluvial deposits, with active alluvial deposits (**Qac**) occurring along the unnamed drainage on the north side of the site.

Hazards Review: In addition to the review and location query we searched for nearby or proximal classifications or conditions that could possibly present hazardous conditions to the site. A summary of this search is provided as follows:

1. **Landsliding:** The nearest active landslide units are mapped as **Qms** deposits by Coogan and King (2016), and are located approximately 1700 feet to the east of the site, as shown on Figure 3. These deposits should not impact the proposed subdivision.

2. **Alluvial fan debris flow processes** including flash flooding and debris flow hazard: The nearest potential debris flow process deposits to the site are mapped as **Qafy** by Coogan and King (2016)**,** and occur approximately 960 feet to the northeast of the site, and these deposits should not impact the proposed subdivision.

3. **Surface fault rupture hazards, strong earthquake ground motion, tectonic Subsidence and liquefaction:**

   Surface fault rupture hazards: The nearest active (Holocene) earthquake fault to the site is the Weber section of the Wasatch fault zone (UT2351E) which is located 3.7 miles west of the site, thus fault rupture hazards are not considered present on the site (Black and others, 2004). The Ogden Valley North Fork fault (UT2376) is located much closer to the site, approximately 0.5 miles to the southwest of the proposed subdivision, however the most recent movement along this fault is estimated to be pre-Holocene (<750,000 ybp), and is not considered an active risk to the site (Black and others, 1999). Active earthquake faults are generally considered to be faults which have disrupted the ground surface within the past 11,000 years of earth history (the Holocene epoch). Implied with this definition is that such faults are likely to disrupt the ground surface in the relatively near future (Lund and others, 2016).

   Strong earthquake ground motion originating from the Wasatch fault or other near-by seismic sources is capable of impacting the property. The Wasatch fault zone is considered active and capable of generating earthquakes as large as magnitude 7.3 (Arabasz and others, 1992). Based on probabilistic estimates (Peterson, and others, 2014) queried for the site, the expected peak horizontal ground acceleration on rock from a large earthquake with a ten-percent probability of exceedance in 50 years is as high as 0.20*g,* and for a two-percent probability of exceedance in 50 years is as high as 0.49*g* for the site.

   The a ten-percent probability of exceedance in 50 years event has a return period of 475 years, and the 0.20*g* acceleration for this event corresponds " strong" perceived shaking with "light" potential damage based on instrument intensity correlations. The two-percent probability of exceedance in 50 years event has a return period of 2475 years, and the 0.49*g* acceleration for this event corresponds "severe" perceived shaking with "moderate to heavy" potential damage based on instrument intensity correlations (Wald and others, 1999).

   Future ground accelerations greater than these are possible but will have a lower probability of occurrence.

   Tectonic Subsidence is surface tilting subsidence that occurs along the boundaries of normal faults in response to surface-faulting earthquakes (Keaton, 1986). Because the site is not located in near proximity to active earthquake faults, tectonic subsidence hazards are not considered a risk to the site.

Liquefaction potential hazards: In conjunction with strong earthquake ground motion potential of large magnitude seismic events as discussed previously, certain soil units may also possess a potential for liquefaction during a large magnitude event. Liquefaction is a phenomenon whereby loose, saturated, granular soil units lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlements of overlying layers after an earthquake as excess pore water pressures are dissipated. Horizontally continuous liquefied layers may also have a potential to spread laterally where sufficient slope or free-face conditions exist. The primary factors affecting liquefaction potential of a soil deposit are: (1) magnitude and duration of seismic ground motions; (2) soil type and consistency; and (3) occurrence and depth to groundwater.

Liquefaction potential hazards have not been studied or mapped for the Ogden Valley area, as has occurred in other parts of northern Utah (Anderson and others, 1994). Liquefaction commonly occurs in saturated non-cohesive soils such as alluvium, consequently the alluvial deposits on the site mapped as deposits **Qab – Qapb**, **Qa2/Qafp?** and **Qac** may be susceptible to liquefaction during a future large earthquake event.

4. **Rockfall and avalanche hazards**: The site is over a mile from steep slope areas where such hazards may originate.

5. **Flooding:** Mapping by Federal Emergency Management Agency (FEMA, 2015) is shown on Figure 3. The Zone A and AE shown on Figure 3, includes the 100-year flood hazard zone as delimited by FEMA (2015) studies conducted in the Ogden Valley area. On the basis of the FEMA determination *...mandatory flood insurance purchase requirements and floodplain management standards apply...*for improvements made in the Zone AE area shown on Figure 3. The entirety of the proposed subdivision is shown to be outside the flood zone areas shown on Figure 3.

   Spring time and rapid snowmelt flooding may occur along the unnamed drainage within the **Qac** mapped areas, on the north side of the site. Local sheet flow, slope wash, and seasonally perched soil should be anticipated for the site, and site improvements.

6. **Sloping surfaces:** The site vicinity slope gradients developed from our LiDAR analysis range from level to well over 50-percent as shown on Figure 4. Within the subdivision area slope gradients are relatively gentle. On Figure 4, the property slopes are shown to slope very gently to the east. The calculated average slope for subdivision area is 4.3 percent.

The threshold gradient for site slope development considerations and hillside review according to the Weber County Section 108-14-3 includes slopes greater that 25-percent (Weber County Code, 2020).

7. **Radon exposure:** Radon is a naturally occurring radioactive gas that has no smell, taste, or color, and comes from the natural decay of uranium that is found in nearly all rock and soil. Radon and has been found occur in the Ogden Valley area, and can be a hazard in buildings because the gas collects in enclosed spaces. Indoor testing following construction to detect and determine radon hazard exposure should be conducted to determine if radon reduction measures are necessary for new construction. The radon-hazard potential mapping has been prepared for most of Ogden Valley by the Utah Geological Survey (Solomon, 1996), and the property appears to be located in an area mapped as having a "Moderate" radon potential classification. For new dwelling structures radon-resistant construction techniques as provided by the EPA (2016) should be considered.

Site Reconnaissance

The proposed subdivision site was reconnoitered on December 12, 2020. The property was observed to be open and undeveloped and appears to be used for agriculture purposes. The property was accessed from 3100 East Street on the east side of the property. The surface of the site consists primarily of a nearly planar surface that slopes very gently to the east.

Cover vegetation on the site is assumed to consist of cultivated pasture grass, with the site observed to be almost entirely covered with cut hay during the time of our reconnaissance. Site soils were observed to be silty sands and sandy silts, with gravel and cobbles presumed to be at depth.

Irrigation piping and sprinkler connections were observed stationed across the site. The unnamed drainage on the north side of the site was observed to be approximately three feet lower than surrounding ground, and ice-covered but flowing at the time of our reconnaissance.

At the time of our reconnaissance, adjacent properties were similarly undeveloped or consisted of farmsteads with single family homes. During the reconnaissance no conditions of imminent geologic hazards were observed at the site.

CONCLUSIONS

Based upon the findings of this review we believe that the subject 14.02-acre proposed subdivision location is not adversely exposed to the geological hazards specified in the Section 108-22 Natural Hazard Areas of the Weber County Code (2020). With this finding we point out that the alluvial deposits on the site mapped as **Qab – Qapb, Qa2/Qafp? and Qac** may be susceptible to liquefaction during a future large earthquake event. Liquefaction Potential studies are not required for residential land uses in Weber County; however, disclosure of such conditions is required by Sec. 108-

22-4. - Disclosure required of the Weber County Code (2020). For the subdivision property we consider the potential liquefaction hazard as undetermined, and disclose that the hazard may be present on the site.

Rapid snowmelt and spring run-off flooding may occur during the future on the unnamed drainage on the north side of the site, to avoid potential flooding we recommend that the mapped **Qac** areas on the site be avoided for the placement of dwellings on the proposed subdivision.

Because groundwater and subsurface soils conditions for the site are presently unevaluated, we suggest that site specific geotechnical engineering soils and groundwater study be considered for the eventual subdivision design and construction, and minimally we recommend that a licensed Geotechnical Engineer observe the foundation excavations prior to the setting of the footings of the homesite structures to be constructed on the proposed subdivision, to confirm the suitability of the foundation soils for the proposed subdivision construction.

Although not addressed by the Weber County ordinances, we recommend that radon exposure be evaluated to determine if radon reduction measures are necessary for the homesite construction on the proposed subdivision. It is our understanding that new construction in Ogden Valley area often includes radon remedial measures as part of final design.

LIMITATIONS

Our services were limited to the scope of work discussed in the introduction section of this report, and the **Conditions** specified in our (GCS) Proposal-Agreement dated December 5, 2020. The results provided by this study are limited to geological hazards included as "potential hazards" in Section 108-22 Natural Hazard Areas of the Weber County Code (2020). The reporting provided here is not a geotechnical engineering study based upon subsurface observations, and should in no way preclude the results of geotechnical engineering soils and groundwater studies for foundations, earthwork, and geoseismic design prepared by a professional engineer licensed in the State of Utah.

Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. The recommendations contained in this report are based on our site observations, available data, probabilities, and our understanding of the facilities investigated. This report was prepared in accordance with the generally accepted standard of practice at the time the report was written. No warranty, express or implied, is made.

This report may be used only by the Client and only for the purposes stated within a reasonable time from its issuance. The regulatory requirements and the "state of practice" can and do change from time to time, and the conclusions presented herein may not remain current. Based on the intended use of the report, or future changes to design, GCS Geoscience may require that additional work be performed and that an

updated report be issued. Non-compliance with any of these requirements by the Client or anyone else, unless specifically agreed to in advance by GCS Geoscience in writing will release GCS Geoscience from any liability resulting from the use of this report by any unauthorized party.

REFERENCES

Anderson, L.R., Keaton, J.R., and Bay, J.A., 1994, Liquefaction potential map for the northern Wasatch Front, Utah, complete technical report: Utah Geological Survey Contract Report 94-6, 150 p., 6 plates, scale 1:48,000.

Arabasz, W.J., Pechmann, J.C., and Brown, E.D., 1992, Observational seismology and the evaluation of earthquake hazards and risk in the Wasatch Front area, Utah, in Gori, P.L., and Hays, W.W., (eds.), Assessment of regional earthquake hazards and risk along the Wasatch Front, Utah: U.S. Geological Survey Professional Paper 1500-D, 36 p.

Avery, C., 1994, Ground-water hydrology of Ogden Valley and surrounding area, eastern Weber County, Utah, and simulation of ground-water flor in the valley-fill aquifer system; Utah Department of Natural Resources, Technical Publication no. 99, 84 p.

Black, B.D., DuRoss, C.B., Hylland, M.D., McDonald, G.N., and Hecker, S., compilers, 2004, Fault number 2351e, Wasatch fault zone, Weber section, in Quaternary fault and fold database of the United States: U.S. Geological Survey *website, http://earthquakes.usgs.gov/hazards/qfaults, accessed 06/20/2016 02:49 PM.*

Black, B.D., and Hecker, S., compilers, 1999, Fault number 2376, Ogden Valley North Fork fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, http://earthquakes.usgs.gov/hazards/qfaults, accessed 06/20/2016 02:51 PM.

Coogan, J.C., and King, J.K., 2016, Interim geologic map of the Ogden 30' x 60' quadrangle, Box Elder, Cache, Davis, Morgan, Rich, and Summit Counties, Utah, and Uinta County, Wyoming: Utah Geological Survey Open File Report 653DM, for use at 1:62,500 scale, 3 plates, 147 p.

Currey, D.R., and Oviatt, C.G., 1985, Durations, average rates, and probable causes of Lake Bonneville expansion, still-stands, and contractions during the last deep-lake cycle, 32,000 to 10,000 years ago, in Kay, P.A., and Diaz, H.F., (eds.), Problems of and prospects for predicting Great Salt Lake levels - Processing of a NOAA Conference, March 26-28, 1985: Salt Lake City, Utah.

EPA 2016, Radon-Resistant Construction Basics and Techniques: Environmental Protection Agency website, https://www.epa.gov/radon/radon-resistant-construction-basics-and-techniques accessed 07/20/2016

FEMA, 2015, Flood Insurance Rate Map, 2015 Weber County, Utah, Panel 49057C0228F, Scale 1 inch equals 1000 feet.

GDAL-SOFTWARE-SUITE, 2013, Geospatial data abstraction library. http://www.gdal.org.

GRASS-PROJECT, 2013. Geographic resource analysis support system. http://grass.osgeo.org.

Keaton, J.R., 1986, Potential consequences of tectonic deformation along the Wasatch fault: Utah State University, Final Technical Report to the U.S. Geological Survey for the National Earthquake Hazards Reduction Program, Grant 14-08-0001-G0074, 23 p.

King, J.K., and McDonald, G.N., 2014, Progress report geologic map of the Huntsville quadrangle, Weber and Cache Counties, Utah: Utah Geological Survey files, scale 1:24,000.

Lund, W.R., Christenson, G.E., Batatian, L.D., and Nelson, C.V., 2016, Guidelines for evaluating surface-fault-rupture hazards in Utah, *in* Bowman, S.D., and Lund, W.R., editors, Guidelines for investigating geologic hazards and preparing engineering-geology reports, with a suggested approach to geologic-hazard ordinances in Utah: Utah Geological Survey Circular 122, p. 31–58.

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 update of the United States national seismic hazard maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p.

Sorensen, M.L., and Crittenden, M.D., Jr., 1979, Geologic map of the Huntsville quadrangle, Weber and Cache Counties, Utah: U.S. Geological Survey Geologic Quadrangle Series Map GQ-1503, scale 1:24,000.

U.S. Geological Survey and Utah Geological Survey, 2016, Utah Quaternary fault and fold database: Online, http://geology.utah.gov/resources/data-databases/qfaults/

Wald, D.J., Quitoriano, V., Heaton, T.H., and Kanamori, H., 1999, Relationship between Peak Ground Acceleration, Peak Ground Velocity, and Modified Mercalli Intensity in California: Earthquake Spectra, v. 15, no. 3, p. 557-564

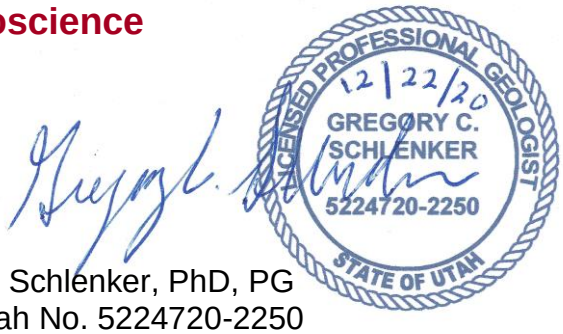
Weber County Code, 2020, retrieved from: https://www.municode.com/library/ut/weber_county/codes/code_of_ordinances

Weber County Inspection, 2020, retrieved from: http://www.webercountyutah.gov/inspection/documents/Development Process Packet.pdf

We appreciate the opportunity to work with you on this project and look forward to assisting you in the future. If you have any questions or need additional information on this or other reporting, please contact the undersigned at (801) 745-0262 or (801) 458-0207.

Respectfully submitted,

GCS Geoscience



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Principal Geologist

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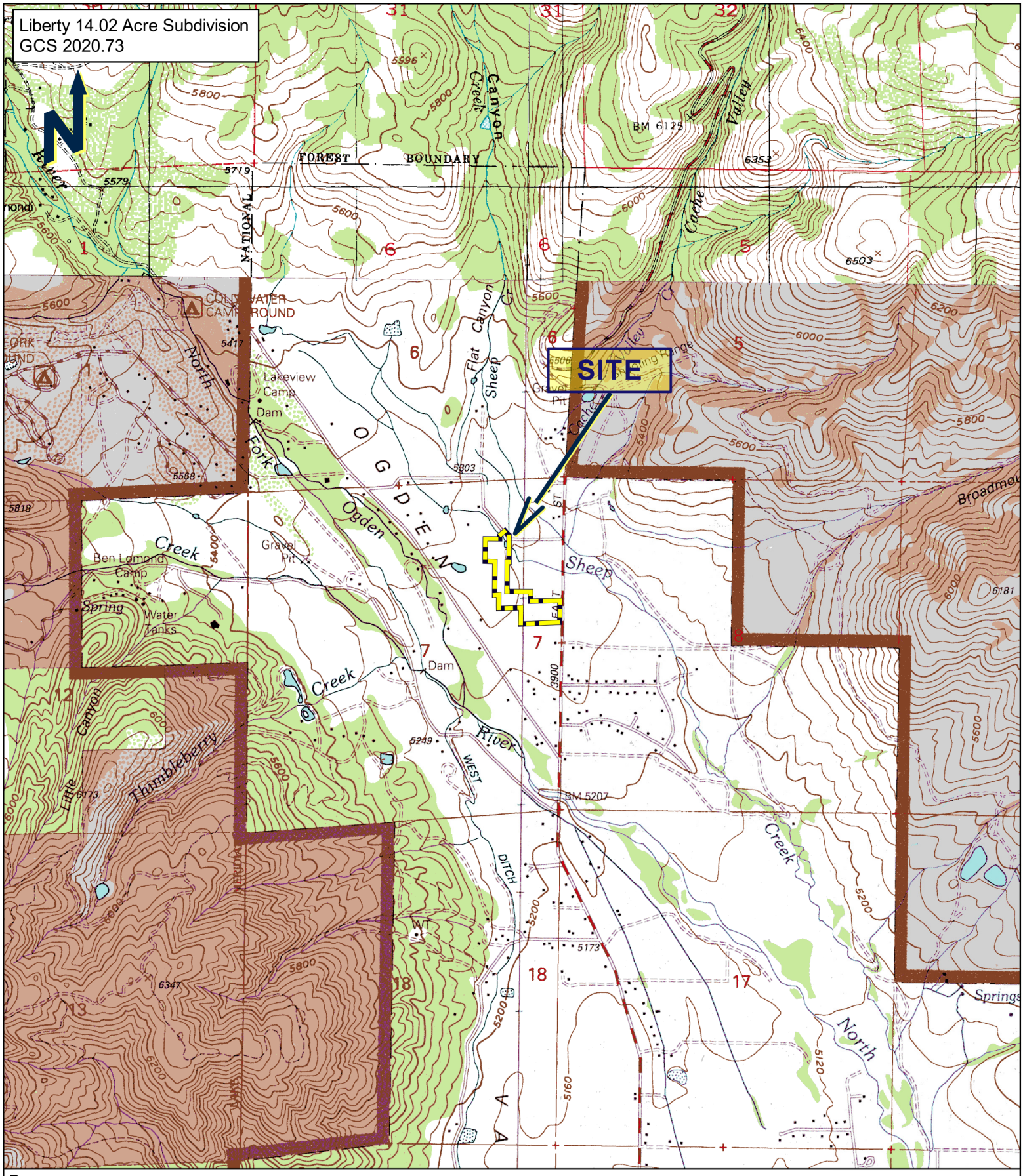
Huntsville, Utah 84317

Encl. Figure 1, Site Vicinity Map
Figure 2, Aerial Coverage
Figure 3, Geologic Mapping
Figure 4, LiDAR Analysis



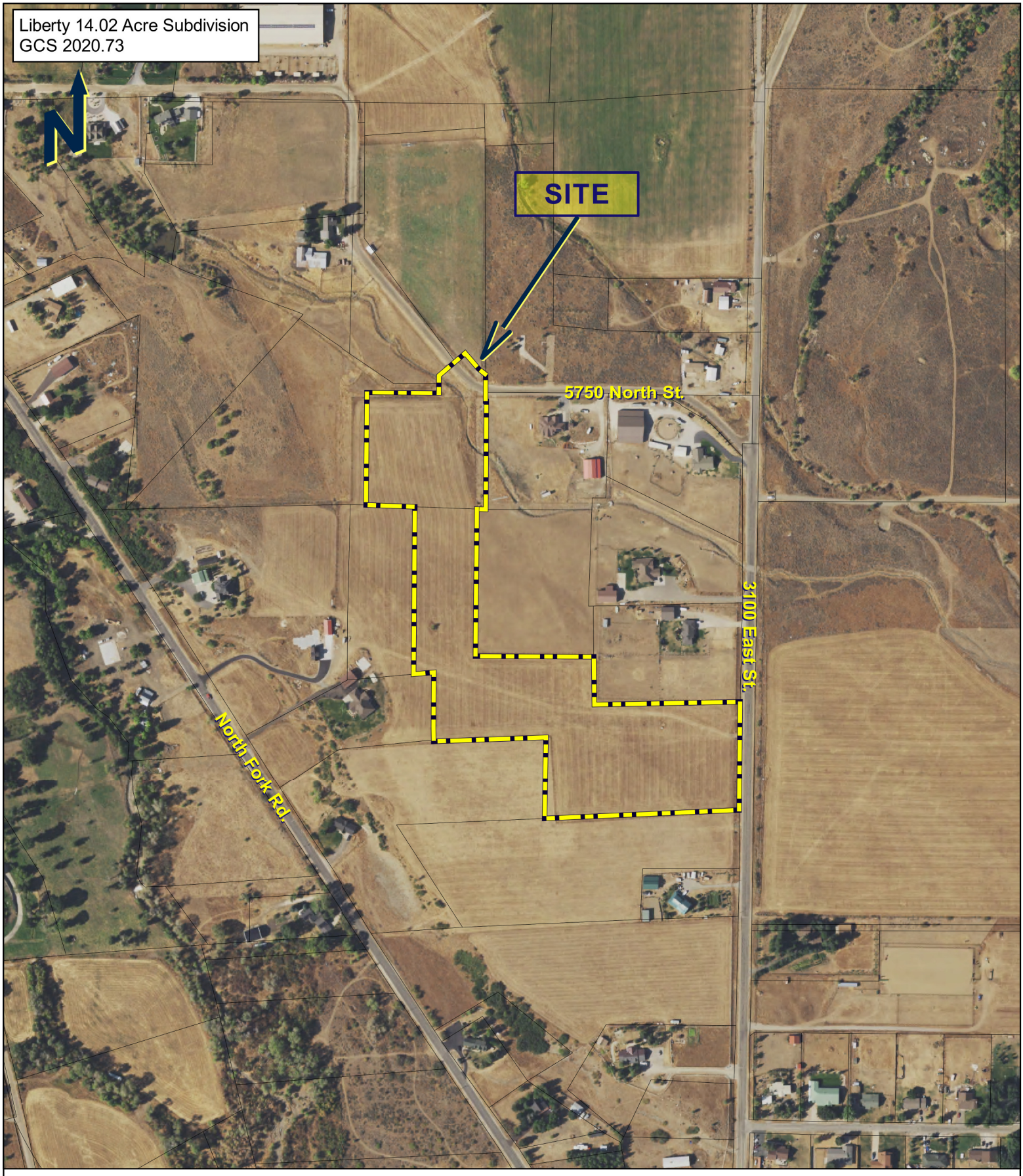
Base:
USGS 7.5 Minute topographic maps titled "North Ogden, Utah 1998; Mantua, Utah, 1991; James Peak , Utah 1991; and Huntsville, Utah 1998"from Utah AGRC; http://gis.utah.gov/

0 2000 4000 ft

1:24,000

FIGURE 1
VICINITY MAP

GCS Geoscience



Base:
2018 0.6m NAIP Color Orthoimagery,
from Utah AGRC; http://gis.utah.gov/

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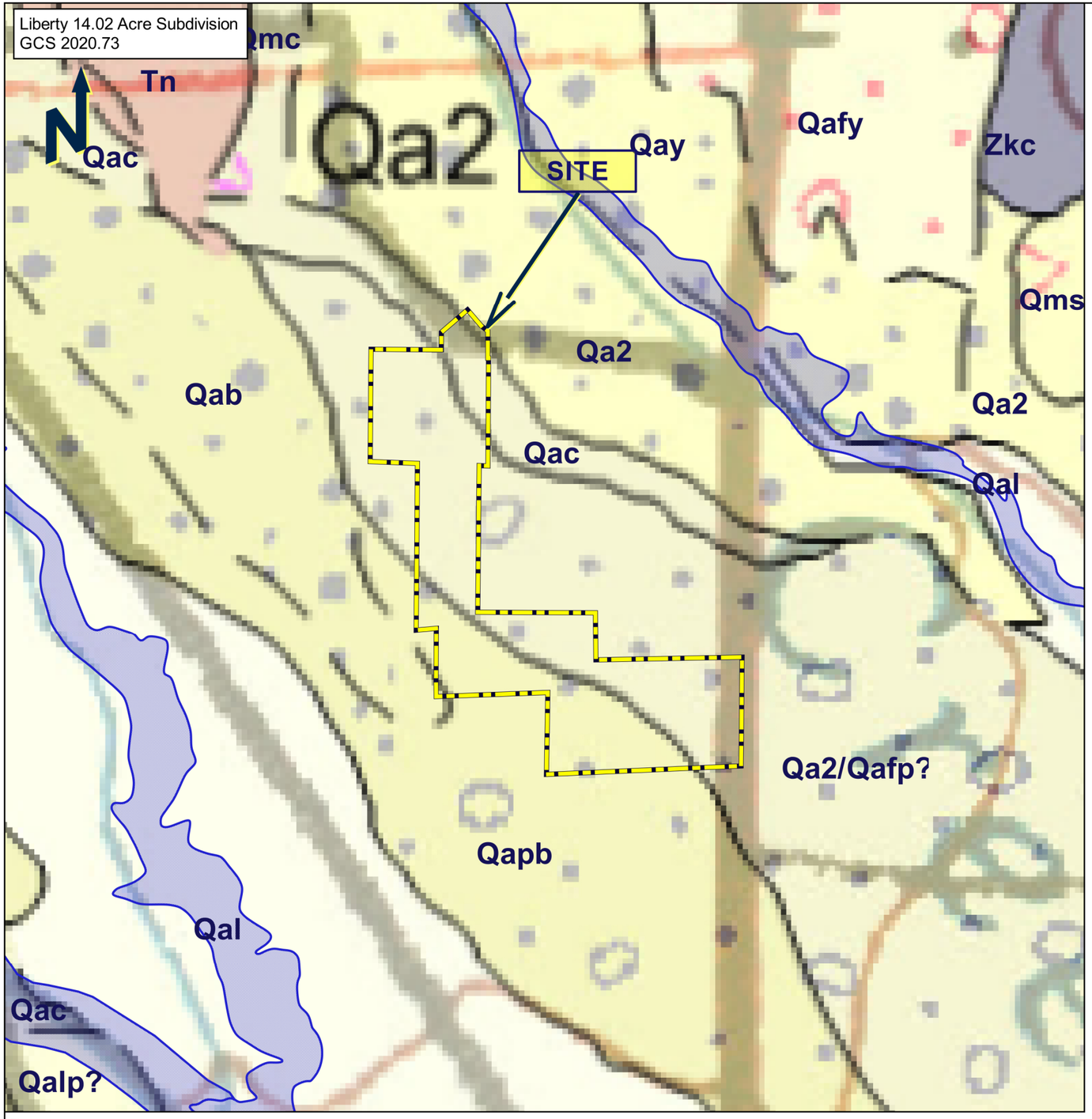
1:4,800

FIGURE 2
AERIAL COVERAGE

GCS Geoscience



Base:
Coogan and King, 2016

0 400 800 ft

1:4,600

Geology (after Coogan and King, 2016)

Qal – Alluvial deposits (mostly Holocene). Moderately sorted, unconsolidated sand, silt, clay, and gravel; locally includes muddy, organic overbank and oxbow lake deposits...

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Qms - Landslide deposits (Holocene and upper and middle? Pleistocene) – Poorly sorted clay- to boulder sized material; includes slides, slumps, and locally flows and floods...

Qalp? - Lake Bonneville regression-age stream alluvium (upper Pleistocene?) – Pebble and cobble gravel, gravelly sand and silty sand, with minor clay in channel incised into Lake Bonneville deltaic and lacustrine deposits...

Qab - Qapb - Lake Bonneville-age alluvium (upper Pleistocene) – Related to shorelines of Lake Bonneville, Sand, silt, clay, and gravel in channels, flood plains, and terraces, unconsolidated to weakly consolidated alluvium...

Qa2/Qafp? - Younger alluvium (mostly Holocene) **Qa2** over **Qafp?** Lake Bonneville-age alluvial-fan deposits (upper Pleistocene) — Related to shorelines of Lake Bonneville, mostly sand, silt, and gravel that is poorly bedded and poorly sorted...

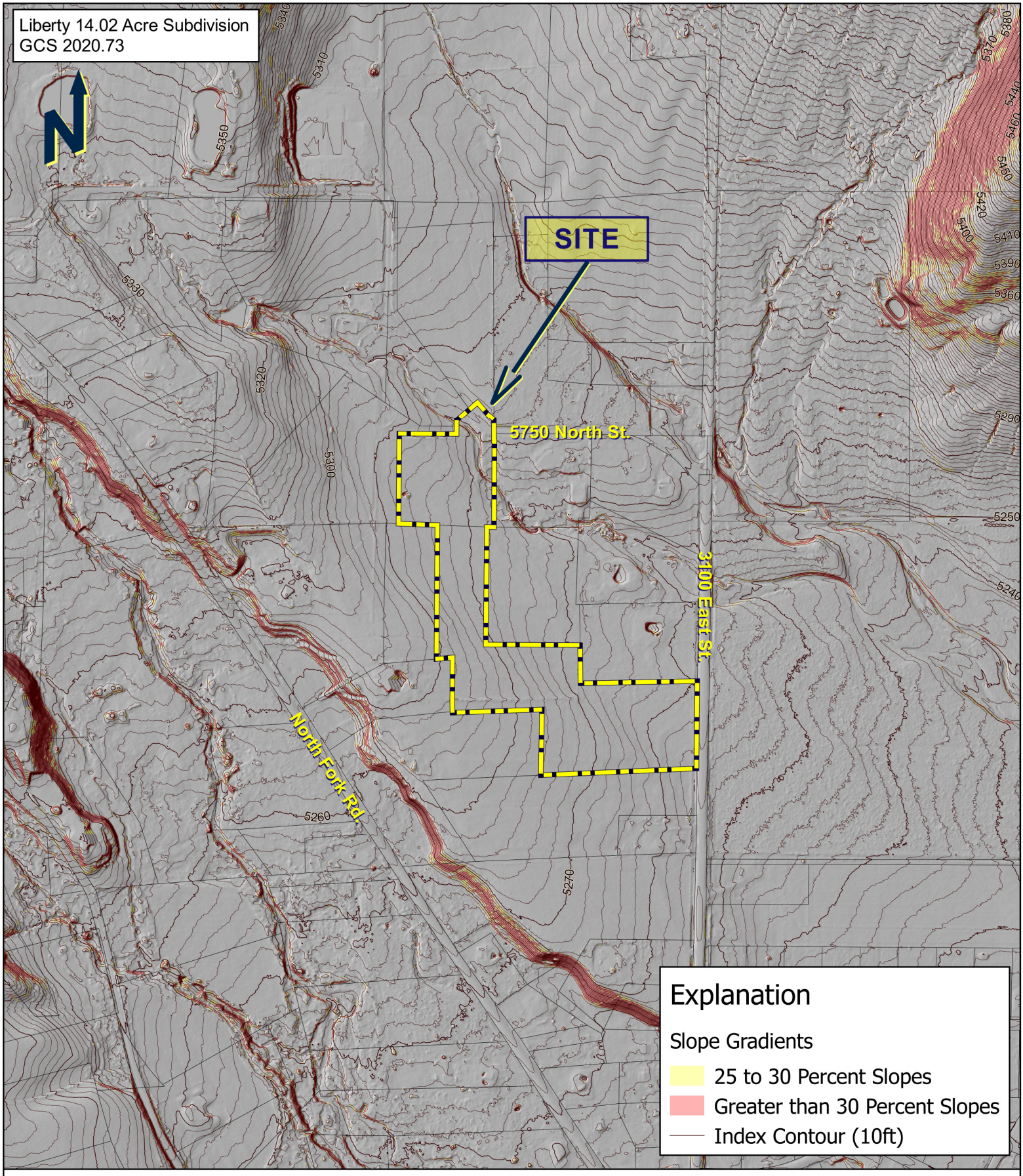
Tn – Norwood Formation (lower Oligocene and upper Eocene) – Typically light-gray to light-brown altered tuff (claystone), altered tuffaceous siltstone and sandstone, and conglomerate...

Zkc - Kelley Canyon Formation (Neoproterozoic) – Dark-gray to black, gray to olive-gray-weathering argillite to phyllite, with rare metacarbonate ...The Kelley Canyon Formation is prone to slope failures...

FEMA - Flood Insurance Rating Zones (2015)

Zone A and AE- Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies...Mandatory flood insurance purchase requirements and floodplain management standards apply.

FIGURE 3
GEOLOGIC MAPPING
GCS Geoscience



Base:
2011 1.0m LiDAR Imagery,
from Utah AGRC; http://gis.utah.gov/

0 500 1000 ft

1:6,000

FIGURE 4
LiDAR ANALYSIS

GCS Geoscience

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Consideration and action on a request for preliminary approval of Hidden Brook Estates Subdivision, consisting of 9 lots.
Type of Decision	Administrative
Agenda Date:	Tuesday, May 24, 2022
Applicant:	Brandon Janis
File Number:	UVH042622

Property Information

Approximate Address:	2050 N Big Sky Drive, Liberty
Project Area:	27.8 acres
Zoning:	Forest Valley (FV-3)
Existing Land Use:	Forest
Proposed Land Use:	Residential Subdivision
Parcel ID:	22-040-0024, 22-040-0023
Township, Range, Section:	T7N, R1E, Section 33

Adjacent Land Use

North:	Residential	**South:**	Forest
East:	Forest	**West:**	Forest

Staff Information

Report Presenter:	Felix Lleverino flleverino@co.weber.ut.us 801-399-8767
Report Reviewer:	RK

Applicable Ordinances

- Title 101 (General Provisions) 1-7 (Definitions)
- Title 104 (Zones) Chapter 14 (Forest Valley 3 Zone)
- Title 104 (Zones) Chapter 28 (Ogden Valley Sensitive Lands Overlay District)
- Title 106 (Subdivisions)
- Title 108 (Standards) Chapter 22 (Natural Hazard Areas)

Background

The applicant is requesting preliminary approval for a nine-lot subdivision that will gain access from Big Sky Drive, a private road within Big Sky Estates. The private right-of-way is proposed to be 50 feet in width that will provide frontage for eight of the nine lots. Lot six is proposed to front on Big Sky Drive. It is important to note that this portion of Big Sky drive is a terminal street and that 14 lots currently gain access from this terminal street. The recommendation in this report is to only grant preliminary approval for eight lots, including lots 1 through 5 and lots 7 through 9. Lot 6 cannot be approved as proposed because LUC 106-2-2.4 states that terminal streets may only serve a maximum of 14 lots.

The developer will be required to construct the road to a County standard for a private road. The road improvements will extend from the intersection of 2050 North Street and Big Sky Drive to a turnaround area that also stubs to the adjacent property to the east. 2050 North Street will serve as the primary access for residents within the Hidden Creek Development. In an emergency, the residents will have access to an alternate exit through a break-away gate. The fire access road connects with Osprey Ranch and may be used for Hidden Brook residents and Osprey Ranch residents. Where the Hidden Brook Road terminates, Weber County Fire and Engineering will require a turn-around. The Fire District and County Engineer require that the entire length of 2050 North is built to a county standard.

As part of the approval process, the proposal has been reviewed against the current Weber County Land Use Code (LUC), and the standards of the FV-3 zone found in LUC §104-14. The following section is a brief analysis of this project against current land use regulations.

Analysis

General Plan: This proposal conforms with the Ogden Valley General Plan (OVGP) by encouraging low-density development that preserves open space (see page 21 of the OVGP).

Zoning: The property is located in the FV-3 Zone. The purpose of this zone is stated in the LUC §104-14-1.

> *"The purpose of the Forest Valley Zone, FV-3 is to provide an area for residential development in a forest setting at a low density, as well as to protect as much as possible the naturalistic environment of the development."*

Site Development Standards: The site development standards for the FV-3 zone are as follows:

Minimum lot width: 150 feet

Minimum lot area: 3 acres

Each lot within Hidden Brook Estates conforms to these standards.

Private Street Option: In the Ogden Valley planning area, "the Land Use Authority may find a benefit from a street being temporarily permanently private. The Land Use Authority has full discretion, subject to the regulations herein, to allow or require a street to be private" (106-2-2.1 (b) (1)). This road continuation is an extension of an existing private street called 2050 North. Staff recommends a waiver from the requirement of county ownership stated in 106-2-2.1 (b) (4) due to the existing conditions of Big Sky drive and the lack of county interest in taking ownership of Big Sky Drive.

Natural Hazards: This proposal includes two separate Geologic Hazard Evaluations that have been prepared by Western Geologic, one that evaluates lots 1-8 that is dated October 4, 2018, and the other that evaluates lot nine dated October 8, 2018. Page 12 of the Geologic Hazard Assessment shows a table that was created as a conservative assessment for the entire site and risks that may vary in some areas. Earthquake ground shaking, Landslides and slope failures have a hazard rating of "High" while problem soils have a hazard rating of "Moderate". For this reason, the geologist has requested that a project geotechnical engineer perform an evaluation and set the parameters as needed. The Geologic Hazard Assessment for lot nine lists the same hazards and severity as what has been found within lots one through nine.

The presence of geologic hazards in this subdivision requires the developer to comply with the following section of the County's Natural Hazard Area Ordinance:

LUC 108-22-3 Studies and Reports Required

(d) Development design verification. Whenever possible, avoidance of development in an area with an identified natural hazard is strongly encouraged. However, under the requirements of this chapter, development in an area with an identified natural hazard shall be permitted when it is designed to mitigate and is reasonably safe from, the identified hazard. The final design of the development shall not be accepted by the county unless:

1. The development's state-licensed engineer, or, if applicable, engineers, provide(s) the county with a signed and sealed verification letter stating that, pursuant to the considerations, findings, recommendations, and conclusions of the development's engineering geologist's study and report, the development has been designed to mitigate, and is reasonably safe from, the identified hazard.
2. The development's engineering geologist submits a signed and sealed verification letter stating that the final design of the development adequately provides for the considerations, findings, recommendations, and conclusions of the study and report, and is reasonably safe from the identified hazard.
3. Written verification is provided from the issuer(s) of professional errors and omissions liability insurance, in the amount of $1,000,000.00, which covers the engineering geologist and state-licensed engineer(s), and which is in effect on the date of preparation of all required reports and certifications.

A plat note and a notice are required to be added to the final plat and recorded with the subdivision, indicating that geologic hazards are present within this subdivision. The plat note and the notice shall reference the study performed by Western Geologic.

Building Site: The applicant has provided a slope analysis showing the average slope within each lot. The average slope within lots one through nine ranges from 15.78 to 23.29.

Flood Zone: This parcel is within an area of minimal flood hazard and determined to be outside the 500-year flood level.

Sensitive Lands: Exhibit C indicates the presence of a natural year-round stream that requires a 75-foot setback from the high watermark. Page 17 of the Geologic Hazard Assessment titled WAJ Enterprises Property Dated October 4th 2018 states "No homes or septic systems be located within 30 feet of the landslide area without additional subsurface exploration to characterize the lateral extent and thickness of the deposit. The subdivision plat depicts the landslide area labeled Qms (Tn), and the subdivision plat states that a subsurface exploration is required if development is planned for the specified areas.

Culinary Water: Nordic Mountain Water has provided a will-serve letter for all nine lots. The fees have been paid and the developer is in good standing with Nordic Mountain Water (see Exhibit B).

Secondary Water: Nordic Mountain Water does not provide secondary water. Unless the developer shows an allowable method of secondary water for this subdivision, the following section of the subdivision code will apply:

LUC 106-4-2.1(b)(2)c.

c. Secondary water exemption. A subdivision lot that is completely covered by pre-existing native wildland vegetation, and will remain so, is exempt from the secondary water requirements of this section as long as the pre-existing native wildland vegetation remains undisturbed in perpetuity, and is well-established in a manner that makes it relatively unlikely for noxious weed propagation. Clearing minimal area needed for buildings, driveways, accessory uses, wildfire defensible space, and similar uses is allowed under this exemption as long as it does not result in the need for outdoor watering. The following shall be provided with the final plat:

1. A restricted-landscape covenant is recorded to the lot. The covenant shall restrict the removal or addition of living vegetation from the lot unless the owner acquires the secondary water required by this section; and
2. A note shall be placed on the final recorded plat as required in Section 106-1-8.20.

Sanitary System: Weber-Morgan Health Department has provided a feasibility letter for all nine lots.

Review Agencies: The Weber County Fire District has posted comments to Frontier regarding fire hydrant placement and cul de sac design. Weber County Planning Division has submitted preliminary reviews. The County Engineering and Surveying Departments will post reviews at the final subdivision review phase.

Staff Recommendation

Staff recommends preliminary approval of Hidden Creek Estates Subdivision, only for lots 1 through 5 and lots 7 through 9. This recommendation is based on the following conditions:

1. The developer shall obtain and submit a capacity assessment letter from Nordic Mountain Water before receiving a recommendation for final approval from the Planning Commission.
2. A development design verification is required because of the geologic hazards present within the site.
3. The developer shall show compliance with the secondary water requirements in LUC 106-4-2.1(b)(2)c.

This recommendation is based on the following findings:

1. The proposed subdivision conforms to the Ogden Valley General Plan.
2. The proposed subdivision complies with the applicable County codes.
3. The number of lots fronting on Big Sky Drive exceeds 14. Therefore, Lot 6 cannot be included.

Exhibits

A. Hidden Brook Estates Subdivision Plat
B. Nordic Mountain Water, Inc. will-serve letter
C. Feasibility Letter from the Health Department

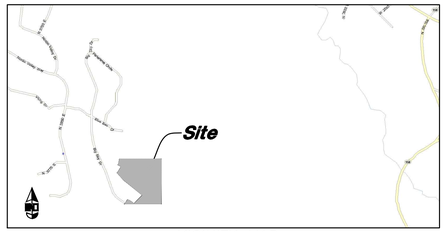
Area Map


Nordic Valley
5100 E
158
Eden
5500 E
1900 N
HWY 162
Pineview Reservoir
Pineview Reservoir
Ogden Canyon
39

Exhibit A

Hidden Brook Estates

A part of the Southwest Quarter of Section 33, T7N, R1E, SLB&M, U.S. Survey
Weber County, Utah
August 2020



VICINITY MAP
Not to Scale

NARRATIVE

This Subdivision Plat was requested by Mr. Brandon Janis for the purpose of creating nine (9) residential Lots.

Property Corners are Monumented as depicted on this survey.

FLOOD PLAIN

This property lies entirely within flood zone X (unshaded) as shown on the FEMA Flood Insurance Rate Map for Weber County, Utah, Community Panel Number 49057C0236 F dated 2 June, 2015. Flood Zone X is defined as "Areas determined to be outside the 0.2% annual chance flood plain" (no shading)

NOTES

1. 10' wide Public Utility Easement as indicated by dashed lines, except as otherwise shown.

2. Stream Protection Easement is 50.0' each side of the High Water Mark of the Stream, as determined and witnessed on the ground.

3. Lots designated with the letter "N" that have structures or septic systems planned within the QMS area will "require additional subsurface exploration to characterize the lateral extent and thickness of the deposit (page 17 of the Geologic Hazard Evaluation, dated October 4, 2018)

4. The following geologic and Geotechnical reports are available for review in the Weber County Planning Office:

Geologic Hazard Evaluation by Western Geologic dated October 4, 2018.

Geologic Hazard Evaluation by Western Geologic dated October 8, 2018.

Geologic Investigation by Christensen Geotechnical dated October 12, 2018 CG Project No. 162-001.

Geologic Investigation by Christensen Geotechnical dated October 12, 2018 CG Project No. 162-002.

5. Engineering Analysis and Recommendations found in the Geotechnical Investigations should be followed for Earthwork, Foundations, Estimated Settlement, Lateral Earth Pressures, Concrete Slab on Construction, Moisture Protection and Surface Drainage, Subsurface Drainage, Slope Stability, Pavement Design, and Construction Consideration.

6. Each Lot is required to Detain its own Storm Water the storage requirement calculates to 1335 cf for the 100-year storm with a release rate of 0.1 cfs/acre based on a 10,000 sq.ft of disturbed area but may be adjusted during the building permit phase based on the area disturbed.
7.

SURVEYOR'S CERTIFICATE

I, Andy Hubbard, do hereby certify that I am a Professional Land Surveyor in the State of Utah, and that I hold License No. 6242920 in accordance with Title 58, Chapter 22, of the Professional Engineers and Land Surveyors Licensing Act. I also certify that I have completed a survey of the property described hereon in accordance with Section 17-23-17 and that I have verified all measurements shown hereon this plat of Hidden Brook Estates in Weber County, Utah and that it has been correctly drawn to the designated scale and is a true and correct representation of the following description of lands, lots, and streets included in said subdivision, based on data compiled from records in the Weber County Recorder's Office. Monuments have been found or placed as represented on this plat. I furthermore certify that all lots within this Subdivision hereby meet all current lot width and area requirements of the Weber County Zoning Ordinance.

Signed this _____ day of _____, 2020.

08/13/2020

PROFESSIONAL LAND SURVEYOR — No. 6242920 — ANDY HUBBARD — STATE OF UTAH

6242920
License No.

Andy Hubbard

OWNERS DEDICATION

We the undersigned owners of the herein described tract of land, do hereby set apart and subdivide the same into lots as shown on the plat and name said tract Hidden Brook Estates and do grant and dedicate a perpetual right and easement over, upon and under the lands designated hereon as public utility easement and/or Detention Pond Easement, the same to be used for the maintenance and operation of public utility service line and storm drainage facilities, whichever is applicable as may be authorized by the governing authority, with no buildings or structures being erected within such easements, and further dedicate to public use all those parts or portions of said tract of land designated as streets, the same to be used as public thoroughfares.

Signed this _____ Day of _____, 2020.

- X -

_____
Brandon Janis - Owner

ACKNOWLEDGMENT

State of Utah
County of } ss

The foregoing instrument was acknowledged before me this_____ day of _____ 2020 by _____X_____.

Residing At:_____

Commission Number:_____

Commission Expires:_____

_____
A Notary Public commissioned in Utah

_____
Print Name

DESCRIPTION

A part of the Southwest Quarter of Section 33, Township 7 North, Range 1 East, Salt Lake Base and Meridian, U.S. Survey, Weber County, Utah:

Beginning at the Southeasterly Corner of Lot 60, Big Sky Estates No. 2 (Entry No. 500942, Book 15 of Plats, Page 85) Weber County, Utah, said point being 905.93 feet South 89°38'24" East along the Section Line and 0.76 feet South 33°30'26" West from the Southwest Corner of said Section 33; and running thence along the Easterly, Southerly and Northerly Lines of said Big Sky Estates No. 2 the following nine (9) courses: (1) North 33°30'26" East 149.22 feet; (2) South 65°30'00" East 34.00 feet to a point of curvature; (3) Southeasterly along the arc of a 528.00 foot Radius curve to the right a distance of 188.91 feet (Central Angle equals 20°29'58" (20°30' Record) and Long Chord bears South 55°15'00" East 187.90 feet) to a point of non-tangency; (4) North 45°00'00" East 358.00 feet; (5) North 51°00'00" West 733.00 feet; (6) North 41°00'00" West 264.00 feet; (7) North 32°11'38" East 215.43 feet to a point of a non-tangent curve; (8) Northwesterly along the arc of a 185.01 foot Radius curve to the left a distance of 101.39 feet (Central Angle equals 31°23'57" and Long Chord bears North 61°25'08" West 100.13 feet) to a point of non-tangency; and (9) North 12°52'49" East 183.84 feet to the Southwesterly Corner of the Skyline Mountain Properties Partners LP Property; thence along said Southerly, Westerly and Northerly Lines the following three (3) courses: (1) South 89°48'28 East 1234.96 feet; (2) South 0°03'57" West 1327.18 feet; and (3) South 89°44'05" West 1079.27 feet to the Southeasterly Corner of said Lot 60 and the Point of Beginning.

Contains 30.686 Acres, more or less

WEBER/MORGAN HEALTH DEPARTMENT

Conforming to state code and county ordinance. Weber-Morgan Health Department I hereby certify that the soil, percolation rates, and site conditions for this subdivision have been investigated by this office and ate approved for on-site wastewater disposal systems

Signed this _____ day of _____, 2020.

_____
Director, Weber-Morgan Health Department

WEBER COUNTY SURVEYOR

I hereby certify that the Weber County Surveyor's Office has reviewed this plat and all conditions for approval by this office has been satisfied. The approval for this plat by the Weber County Surveyor does not relieve the Licensed Land Surveyor who executed this plat from the responsibilities and/or liabilities associated therewith.

Signed this _____ day of _____, 2020.

_____
Weber County Surveyor

WEBER COUNTY ATTORNEY

I have examined the financial guarantee and other documents associated with this subdivision plat, and in my opinion they conform with the County Ordinance applicable thereto and now in force and effect.
Signed this _____ day of _____, 2020.

_____
Weber County Attorney

WEBER COUNTY ENGINEER

I hereby certify that the required public improvement standards and drawings for this subdivision conform with County standards and the amount of the financial guarantee is sufficient for the installation of these improvements.

Signed this _____ day of _____, 2020

_____
Weber County Engineer

WEBER COUNTY COMMISSION ACCEPTANCE

This is to certify that this subdivision plat, the dedication of streets and other public ways and financial guarantee of public improvements associated with this subdivision, thereon are hereby approved and accepted by the Commissioners of Weber County, Utah this _____ day of _____, 2020.

_____
Chairman, Weber County Commission

Attest: _____

Title: _____

WEBER COUNTY PLANNING COMMISSION APPROVAL

This is to certify that this subdivision plat was duly approved by the Weber County Planning Commission.
Signed this _____ day of _____, 2020.

_____
Chairman, Weber County Planning Comission

GREAT BASIN ENGINEERING INC
5746 South 1475 East Ogden, Utah 84403
Main (801)394-4515 S.L.C (801)521-0222 Fax (801)392-7544
www.greatbasinengineering.com

ENGINEER:
Great Basin Engineering Inc
c/o Andy Hubbard
5746 South 1475 East Suite 200
Ogden, Utah 84405
(801) 394-4515

DEVELOPER:
Nordic Valley Partners, LLC
c/o Brandon Janis
562 South 1100 West
Farmington, Utah 84025
(281) 250-4047
brandonjanis@gmail.com

Sheet 1 of 2

WEBER COUNTY RECORDER

ENTRY NO._____FEE PAID
_____FILED FOR RECORD AND RECORDED_____, AT _____IN BOOK_____OF OFFICIAL RECORDS, PAGE_____. RECORDED FOR _____

_____
WEBER COUNTY RECORDER

BY:_____
DEPUTY

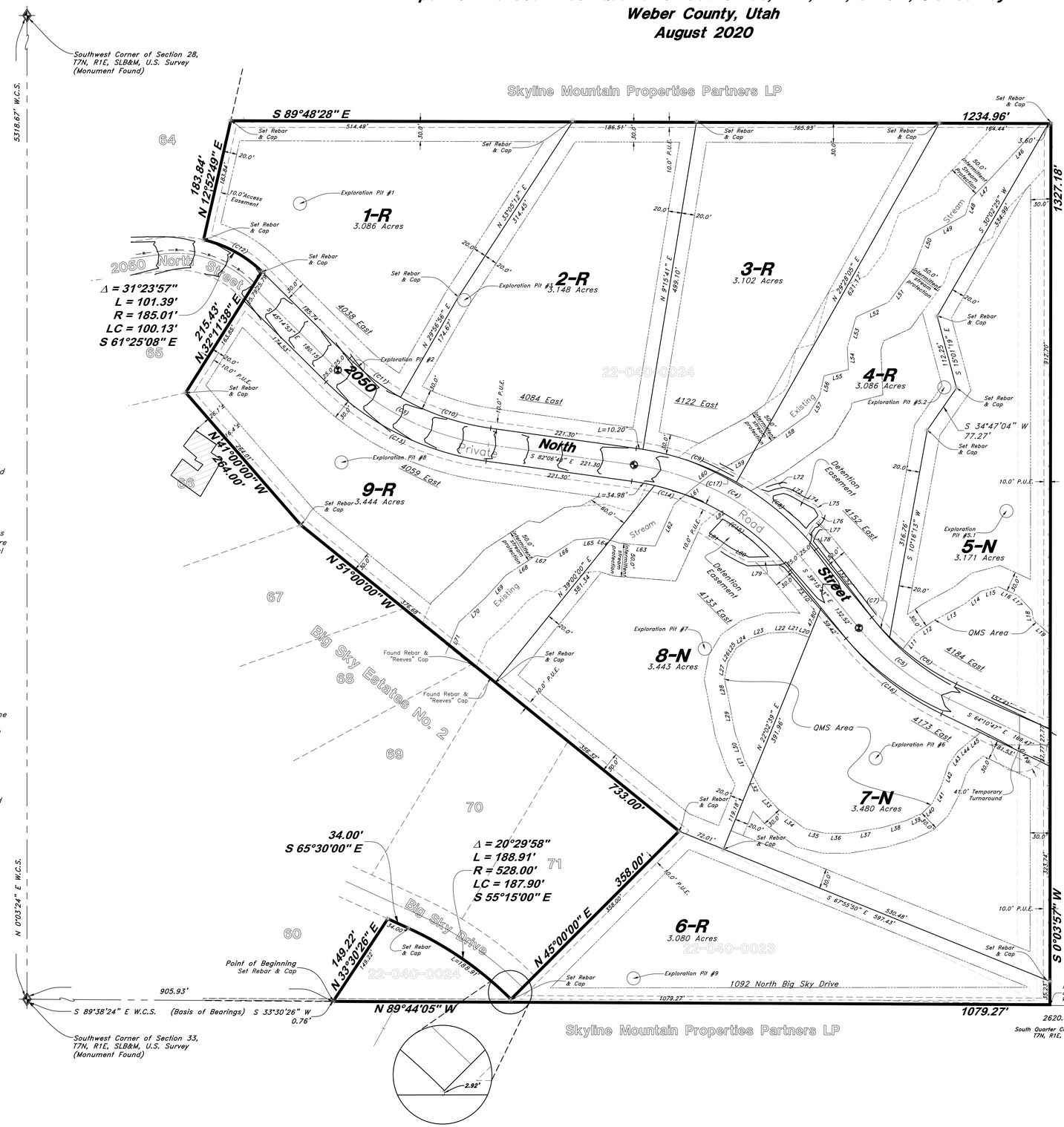
18N753 - AP

W:\18N753 - Janis\Drawings\18N753 - AP.dwg, 8/13/2020 4:26:17 PM, drew, 1:1

Exhibit A

Hidden Brook Estates

A part of the Southwest Quarter of Section 33, T7N, R1E, SLB&M, U.S. Survey
Weber County, Utah
August 2020



Legend

- Monument to be set
- Found Centerline Monument
- (Rad.) Radial Line
- (N/R) Non-Radial Line
- PUE Public Utility Easement
- PU&DE Public Utility & Drainage Easement
- Fence
- Buildable Area
- Set Hub & Tack
- A will be set Nail in Curb
- @ Extension of Property
- Set 5/8"x 24" Long Rebar & Cap w/ Lathe

NOTES

1. 10' wide Public Utility Easement as indicated by dashed lines, except as otherwise shown.

2. Stream Protection Easement is 50.0' each side of the High Water Mark of the Stream, as determined and witnessed on the ground.

3. Lots designated with the letter "N" that have structures or septic systems planned within the QMS area will "require additional subsurface exploration to characterize the lateral extent and thickness of the deposit (page 17 of the Geologic Hazard Evaluation, dated October 4, 2018)

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QMS Line Table		
Line #	Length	Direction
L20	19.886	N71° 29' 17.11"W
L21	7.850	N79° 31' 02.81"W
L22	33.725	S87° 59' 17.81"W
L23	29.003	S73° 40' 22.41"W
L24	25.951	S56° 06' 45.79"W
L25	12.751	S30° 53' 49.44"W
L26	12.751	S30° 53' 53.71"W
L27	25.557	S10° 36' 02.16"W
L28	30.637	S11° 42' 46.95"E
L29	50.232	S10° 33' 38.09"E
L30	44.839	S19° 08' 39.21"E
L31	1.247	S24° 35' 44.32"E
L32	51.647	S28° 41' 21.37"E
L33	39.342	S43° 06' 23.68"E
L34	47.556	S54° 06' 07.79"E
L35	30.951	S76° 25' 41.06"E
L36	33.817	S89° 47' 08.21"E
L37	54.067	N80° 35' 18.59"E
L38	36.711	N73° 38' 19.94"E
L39	26.548	N65° 08' 43.47"E
L40	20.683	N45° 55' 36.74"E
L41	29.535	N28° 01' 52.28"E
L42	33.550	N18° 10' 34.62"E
L43	25.734	N35° 02' 39.97"E
L44	10.983	N50° 54' 23.84"E
L45	32.893	N50° 01' 47.94"E
L11	30.031	N38° 02' 06.16"E
L12	35.719	N55° 36' 02.57"E
L13	50.814	N61° 52' 58.80"E
L14	31.066	N51° 46' 29.06"E
L15	27.578	N74° 58' 48.00"E
L16	32.263	S65° 26' 37.13"E
L17	31.072	S43° 13' 12.56"E
L18	14.456	S9° 22' 36.89"E
L19	30.653	S48° 57' 59.46"E

Stream Line Table		
Line #	Length	Direction
L46	112.037	S42° 54' 28.26"W
L47	43.814	S44° 32' 38.45"W
L48	25.684	S18° 33' 35.33"W
L49	67.805	S60° 58' 14.43"W
L50	48.102	S20° 32' 36.96"W
L51	66.116	S36° 10' 25.93"W
L52	53.701	S65° 25' 57.92"W
L53	47.555	S16° 22' 21.15"W
L54	33.650	S2° 43' 49.59"E
L55	37.718	S75° 23' 23.04"W
L56	30.583	S12° 46' 14.48"W
L57	32.468	S30° 27' 31.24"W
L58	79.245	S54° 31' 03.01"W
L59	97.080	S61° 24' 28.13"W
L60	27.290	S52° 18' 13.12"W
L61	40.516	S49° 45' 58.92"W
L62	69.506	S24° 26' 16.13"W
L63	52.805	N85° 25' 10.05"W
L64	29.377	N73° 18' 49.80"W
L65	39.949	S85° 21' 29.10"W
L66	49.234	S57° 44' 49.34"W
L67	17.660	N81° 43' 14.81"W
L68	53.999	S56° 44' 06.63"W
L69	45.648	S42° 14' 28.87"W
L70	54.517	S47° 23' 04.94"W
L71	51.954	S22° 51' 54.14"W

Easement Line Table		
Line #	Length	Direction
L82	5.360	S52° 18' 13.12"W
L79	51.019	N88° 19' 11.98"E
L80	31.809	S63° 37' 50.65"E
L81	56.487	S56° 34' 24.07"E
L72	22.194	S40° 52' 04.81"E
L73	18.818	S61° 43' 15.43"E
L74	27.954	S62° 16' 59.41"E
L75	16.617	S31° 40' 41.59"E
L76	7.133	S22° 01' 41.67"W
L77	17.000	S48° 22' 26.40"W
L78	18.680	S31° 01' 32.70"W

PROPERTY LINE CURVE DATA					
Curve	Delta	Radius	Length	Chord	Chord Bearing
(C6)	18°47'17"	375.00'	122.97'	122.42'	S 54°47'08" E
(C7)	6°07'47"	375.00'	40.12'	40.10'	S 42°19'37" E
(C8)	21°16'11"	425.00'	157.77'	156.87'	S 49°53'49" E
(C9)	20°12'24"	425.00'	149.89'	149.11'	S 70°38'07" E
(C10)	22°03'43"	375.00'	144.40'	143.51'	S 71°04'56" E
(C11)	14°48'11"	375.00'	96.89'	96.62'	S 52°38'59" E
(C12)	31°23'57"	185.01'	101.39'	100.13'	N 61°25'08" W
(C13)	36°51'55"	425.00'	273.45'	268.76'	S 63°40'50" E
(C14)	7°23'00"	375.00'	48.32'	48.29'	S 73°04'39" E
(C15)	37°30'25"	375.00'	245.48'	241.12'	S 58°00'56" E
(C16)	24°55'03"	425.00'	184.83'	183.38'	S 51°43'15" E
(C17)	4°37'21"	425.00'	34.29'	34.28'	N 62°50'35" W

CURVE DATA					
Curve	Delta	Radius	Length	Chord	Chord Bearing
(C3)	36°51'55"	400.00	257.37	252.95'	S 63°40'50" E
(C4)	42°51'04"	400.00	299.16	292.23'	S 60°41'16" E
(C5)	24°55'03"	400.00	173.96	172.59'	S 51°43'15" E

Scale: 1" = 80'

80 0 20 40 80 100 120 140 160

Graphic Scale

GREAT BASIN ENGINEERING
5746 South 1475 East Ogden, Utah 84403
Main (801)394-4515 S.L.C (801)521-0222 Fax (801)392-7544
www.greatbasinengineering.com

ENGINEER:
Great Basin Engineering Inc
c/o Andy Hubbard
5746 South 1475 East Suite 200
Ogden, Utah 84405
(801) 394-4515

DEVELOPER:
Nordic Valley Partners, LLC
c/o Brandon Janis
562 South 1100 West
Farmington, Utah 84025
(281) 250-4047
brandonjanis@gmail.com

PROFESSIONAL LAND SURVEYOR No. 6242920 ANDY HUBBARD STATE OF UTAH
08/13/2020

WEBER COUNTY RECORDER
ENTRY NO._____ FEE PAID _____
_____FILED FOR RECORD AND RECORDED_____, AT _____
IN BOOK_____OF OFFICIAL RECORDS, PAGE_____. RECORDED FOR _____
_____
WEBER COUNTY RECORDER
BY:_____
DEPUTY

18N753 - AP

W:\18N753 - Janis\Drawings\18N753 - AP.dwg, 8/13/2020 4:26:19 PM, drew, 1:1

Exhibit B

Ref: Nordic Mountain Water, Inc. (NMWI), 4794 East 2600 North, Eden, Utah
Hidden Brook Subdivision, Nordic Valley Partners, LLC, 8 Lots – Single Family Home Sites

To whom it may concern March 29, 2022

NMWI has agreed to provide culinary water services to the Hidden Brook Subdivision/Nordic Valley Partners, for 8-Single Family Home Sites located in Nordic Valley off of Big Sky Drive at approximately 2050 N.

NMWI currently has a fully state-approved water system in Nordic Valley and existing water line that extends along Big Sky Drive and has sufficient water sources, as registered with the State of Utah-Division of Drinking Water, to provide culinary water services to all 8 lots of this subdivision. NMWI does not provide secondary water.

Nordic Valley Partners % Brandon Janis has fully paid for water connections to the existing NMWI water system and is currently in good standing with NMWI.

Bill D Green

Pres. NMWI Board of Directors

Exhibit B

Nordic Mountain Water, Inc.
4794 East 2600 North
P. O. Box 897
Eden, Utah 84310
(801) 745-2605
nmwi@digis.net

May 11, 2022

Reference: Scott & Shelby Beckstead

LOT# BIG SKY ESTATES #21, WEBER COUNTY, UTAH

Weber County Tax ID# 22-040-0023

To Whom It May Concern:

We certify the above referenced property has a culinary water share with Nordic Mountain Water, Inc. guaranteeing the right to connect to the NMWI water system. All labor and materials required to physically connect this property to NMWI water line is the responsibly of the property owner. NMWI is an approved culinary water company in good standing within Weber County, State of Utah

Bill D Green
President of the Board of Directors
Nordic Mountain Water, Inc.

Exhibit C

BRIAN COWAN, MPH, LEHS
Health Officer/Executive Director

WEBER-MORGAN
HEALTH DEPARTMENT

March 1, 2022

Weber County Planning Commission
2380 Washington Blvd.
Ogden, UT 84401

RE: Preliminary Subdivision **Determination**
Hidden Brooks Estates, 9 Lots
Parcel # 22-040-0023
Soil Log # 14747

Gentlemen:

The soil and percolation information for the above-referenced lots have been reviewed. Culinary water will be provided by Nordic Mountain Water Company, an approved community water system. **A letter from the water supplier is required prior to the issuance of a permit.**

ENGINEERING CONSIDERATIONS

Due to variable conditions found throughout the property (including variance in soil types, the presence of wet areas, springs, streams, etc.) absorption fields will be strictly limited to the areas on each lot where feasible soil evaluations have occurred. Current code requirements restrict the placement of the wastewater system absorption field to within 50 feet of the site and soils evaluation test pit location. The flatter areas throughout the property are typically infeasible for septic system installation based on documented high ground water tables in these areas (ranging from <12" to water flowing out of test pits above natural grade).

DESIGN REQUIREMENTS

Lot 1: Documented ground water tables not to exceed 24 inches, fall within the range of acceptability for the utilization of a Wisconsin Mound or Packed Bed Media Wastewater Disposal System as a means of wastewater disposal. Maximum trench depth for a Packed Bed Media System is limited to 12 inches. The absorption system is to be designed using a maximum loading rate of 0.5 gal/ft^2/day for a Packed Bed Media System or 0.25 gal/ft^2/day for a Wisconsin Mound as required for the loam, granular structure soil horizon.

Lot 2: Documented ground water tables not to exceed 24 inches, fall within the range of acceptability for the utilization of a Wisconsin Mound or Packed Bed Media Wastewater Disposal System. Maximum trench depth for a Packed Bed Media System is limited to 12 inches. The absorption system is to be designed using a maximum loading rate of 0.4 gal/ft^2/day for a Packed Bed Media System or 0.2 gal/ft^2/day for a Wisconsin Mound as required for the silty clay, blocky structure soil horizon. **Feasibility of this lot is dependent upon the proposed lot line shift of the western property line to incorporate the soil exploration test pit # 3 located at UTM Zone 12 Nad 83 0428822 E 4571993 N.**

Lot 3, 6, 7, & 9: Documented ground water tables not to exceed 24 inches, fall within the range of acceptability for the utilization of a Wisconsin Mound or Packed Bed Media Wastewater Disposal System. Maximum trench depth for a Packed Bed Media System is limited to 12 inches. The absorption system is to be designed using a maximum loading rate of 0.4 gal/ft^2/day for a Packed Bed Media System or 0.2 gal/ft^2/day for a Wisconsin Mound as required for the sandy clay loam, blocky structure soil horizon.

Lot 4: Documented ground water tables not to exceed 12 inches, fall within the range of acceptability for the utilization of a Wisconsin Mound or Packed Bed Media Wastewater Disposal System with Drip Irrigation. Maximum trench depth for a Packed Bed Media System with Drip Irrigation is limited to 0 inches. The absorption system is to be designed using a maximum loading rate of 0.5 gal/ft^2/day for a

Exhibit C

Packed Bed Media System or 0.25 gal/ft^2/day for a Wisconsin Mound as required for the loam, granular structure soil horizon. **Due to the proximity of this lot to the stream and required system setbacks, a Packed Bed Media System with Drip Irrigation may be the only feasible system for this lot. Feasibility of this lot is dependent upon the proposed lot line shift of the western property line to incorporate the soil exploration test pit # 5.2 located at UTM Zone 12 Nad 83 0429042 E 4571951 N.**

Lot 5: Documented ground water tables not to exceed 12 inches, fall within the range of acceptability for the utilization of a Wisconsin Mound or Packed Bed Media Wastewater Disposal System with Drip Irrigation. Maximum trench depth for a Packed Bed Media System with Drip Irrigation is limited to 0 inches. The absorption system is to be designed using a maximum loading rate of 0.4 gal/ft^2/day for a Packed Bed Media System or 0.2 gal/ft^2/day for a Wisconsin Mound as required for the clay, massive structure soil horizon.

Plans for the construction of any wastewater disposal system are to be prepared by a Utah State certified individual and submitted to this office for review prior to the issuance of a Wastewater Disposal permit.

The following items are required for a formal **subdivision review**; application, receipt of the appropriate fee, and a full sized copy of the subdivision plats showing the location of exploration pits and percolation tests as well as the documented soil horizons and percolation rates. A subdivision review will not occur until all items are submitted. Mylars submitted for signature without this information will be returned.

Each on-site individual wastewater disposal system must be installed in accordance with R317-4, Utah Administrative Code, Individual Wastewater Disposal Systems and Weber-Morgan District Health Department Rules. Final approval will be given only after an on-site inspection of the completed project and prior to the accomplishment of any backfilling.

Please be advised that the conditions of this letter are valid for a period of 18 months. At that time the site will be re-evaluated in relation to rules in effect at that time.

Sincerely,

Ryan Klinge
Environmental Health Division
801-399-7160

Staff Report to the Ogden Valley Planning Commission

Weber County Planning Division

Synopsis

Application Information

Application Request:	Consideration and/or action on a conditional use permit for short term rental use at 4945 E. Wolf Lodge Dr., UT, 84310
Agenda Date:	Tuesday, May 24, 2022
Applicant:	Nicole Nordello, Owner
File Number:	CUP2022-05
Property Information	
Approximate Address:	4945 E. Wolf Lodge Dr., Eden, UT, 84310
Project Area:	0.04 acres
Zoning:	Forest Residential-3 Zone (FR-3)
Existing Land Use:	Residential
Proposed Land Use:	Short Term Rental
Parcel ID:	223700022
Township, Range, Section:	T7N, R1E, Section 22 SW

Adjacent Land Use

North:	Wolf Lodge Drive	**South:**	Residential
East:	Creekside Way	**West:**	Village Way

Staff Information

Report Presenter:	**Marta Borchert** mborchert@co.weber.ut.us 801-399-8761
Report Reviewer:	SB

Applicable Ordinances

- Weber County Land Use Code Title 101 Chapter 1 General Provisions, Section 7 Definitions
- Weber County Land Use Code Title 104 Chapter 17 (FR-3 Zone)
- Weber County Land Use Code Title 108 Chapter 4 (Conditional Uses)
- Weber County Land Use Code Title 108 Chapter 7, section 25 (Nightly Rentals)

Summary and Background

The applicant is requesting a conditional use permit for short term rentals in a residential dwelling located in the FR-3 zone at 3571 N Creekside Way, #72, in Eden. The FR-3 Zone allows a "nightly rental" as a conditional use. The proposed use will occur within an existing dwelling. As such, there is no design review required. Parking will be made available in the existing attached garage. Additional vehicles may park in designated guest parking along Wolf Lodge Drive.

The application is being processed for an administrative review due to the approval procedures in Uniform Land Use Code of Weber County, Utah (LUC) §108-1-2 which requires the planning commission to review and approve applications for conditional use permits.

Analysis

General Plan: As a conditional use, this use is allowed in the FR-3 Zone. With the establishment of appropriate conditions as determined by the Planning Commission, this operation will not negatively impact any of the goals and policies of the General Plan.

Zoning: The subject property is located within the Forest Residential (FR-3) Zone. The purpose of the FR-3 Zone can be further described in LUC §104-17-1 as follows:

"The purpose in establishing the Forest Residential, FR-3 zone is to provide for medium density residential uses of apartment clusters or condo-tels adjacent to and in conjunction with major recreational resorts, recreation areas and facilities in the mountain areas of Weber County on the basis that such medium density multiple-family housing is an integral and normal part of a recreational resort complex catering to the needs of both tourists and permanent home ownership. This zone is intended to be used in mountain locations in areas associated with major recreational resorts."

The current property has one parking space in the garage and one parking space in the driveway. It is recommended that these two spaces be the only two used for this operation.

Conditional Use Review: A review process has been outlined in LUC §108-4-3 to ensure compliance with the applicable ordinances and to mitigate anticipated detrimental effects. The following is an analysis of the conditional use standards as they related to the proposed use:

Standards relating to safety for persons and property. The Weber County Fire District and the County Engineer's Office have approved the proposed use. The buildings are already constructed and occupancy has been given. No conditions are recommended relating to safety for persons and property.

Standards relating to infrastructure, amenities, and services. The proposed use is not anticipated to have a negative impact on the infrastructure, amenities, and services in this area. Impact fees were paid by the original builder of these units.

Standards relating to the environment. The proposed use is not anticipated to negatively impact the environment. No conditions are recommended relating to the impact of the proposed use on the environment.

Standards relating to the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan. When the Villages at Wolf Creek PRUD was developed, the conditional use standards, as they relate to the constructed dwellings, were considered by the Planning Commission. No conditions are recommended to be added to the proposed use regarding the current qualities and characteristics of the surrounding area and compliance with the intent of the general plan.

Prior to issuance of a conditional use permit, the applicant will need to apply for a business license, and approval from the applicable agencies for the proposal, will need to be obtained. A condition has been made part of the Planning Division's recommendations to ensure that this standard is met.

Nightly Rental Ordinance: Under the current land use code, the section titled 'Nightly Rentals' states the following:

The rental of a sleeping room, apartment, dwelling unit, or dwelling for a time period of less than 30 days is considered a nightly rental. Nightly rentals are allowed only when listed as either a permitted or conditional use in a specific zone or when approved as part of a planned residential unit development (PRUD).

Staff Recommendation

Staff recommends approval of this application subject to the applicant meeting the conditions of approval in this staff report and any other conditions required by the Planning Commission. This recommendation is subject to all review agencies and is based on the following conditions:

1. A business license shall be obtained prior to issuance of this conditional use permit.
2. Parking shall occur only in the driveway and the garage associated with this lot.

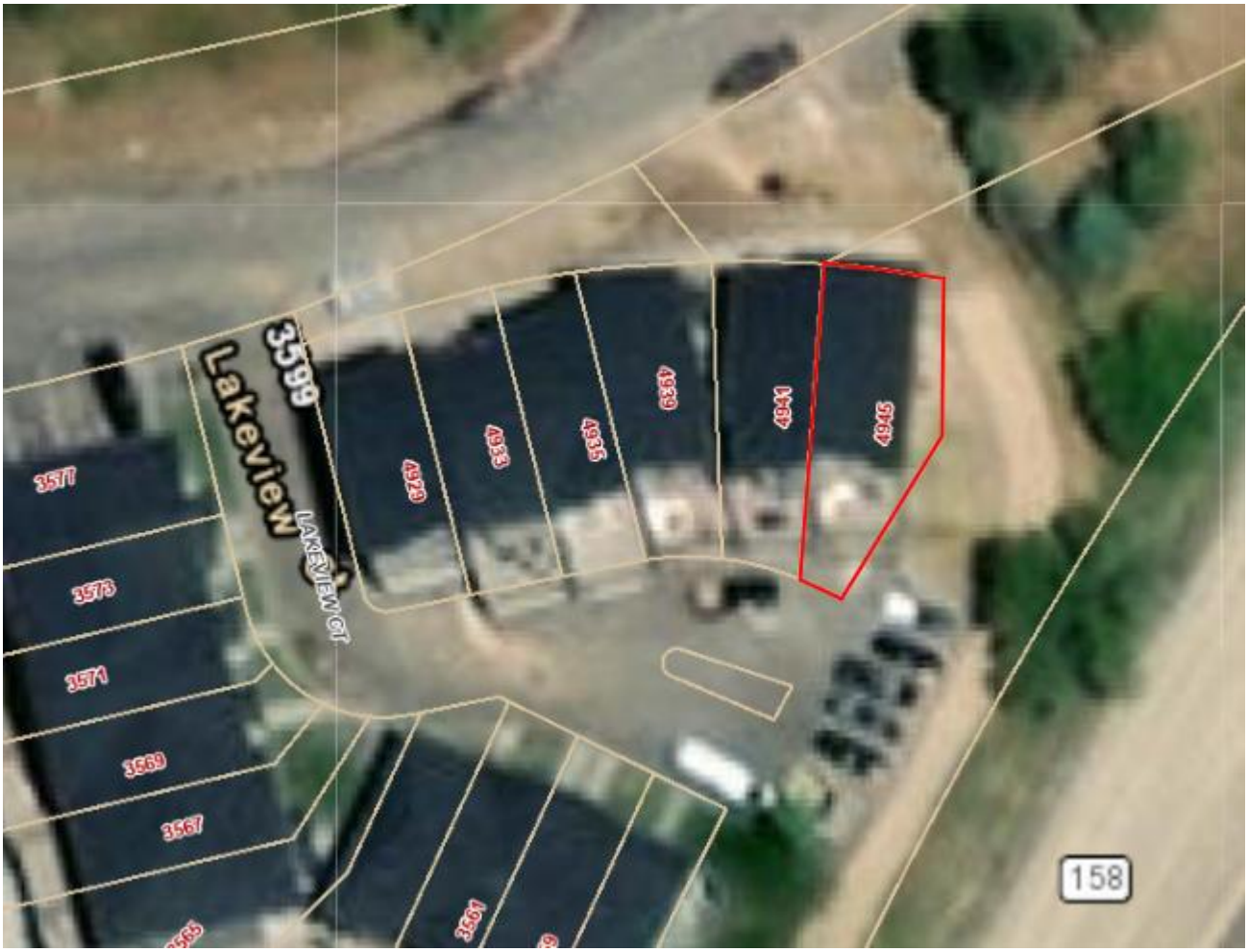
This recommendation is based on the following findings:

1. The proposed use is allowed in the FR-3 Zone and meets the appropriate site development standards.
2. The criteria for issuance of a conditional use permit have been met because mitigation of reasonably anticipated detrimental effects can be accomplished.

Exhibits

A. Application & Narrative
B. Site Plans

Area Map



Nordello -Nicole -Conditional Use Permits

Address:	4945 E. Wolf Lodge Dr. , Eden, UT, 84310
Maps:	Google Maps
Project Type:	Conditional Use Permits
Sub Type:	Conditional Use Permits
Created By:	Nicole Nordello
Created On:	6/28/2021
Project Status:	Accepted
Status Date:	3/30/2022
File Number:	
Project Manager	Marta Borchert

Application | Documents 3 | Comments 1 | Reviews 2 | Followers 5

Application

+ Add Building

Project Description	Conditional Use Permit for Nightly Rental
Property Address	4945 E. Wolf Lodge Dr. Eden, UT, 84310
Property Owner	Nicole Nordello 801-564-2794 Nicolen.aba@gmail.com
Representative	--
Accessory Dwelling Unit	False
Current Zoning	FR-3
Subdivision Name	Village at Wolf Creek
Number of Lots	
Lot Number	84
Lot Size	.03
Frontage	
Culinary Water Authority	Wolfcreek Water Company
Secondary Water Provider	
Sanitary Sewer Authority	Wolfcreek Sewer Improvement District
Nearest Hydrant Address	4941 E Wolf Lodge Dr.
Signed By	Owner, Nicole Nordello

Parcel Number

✖ Remove 223700022 - County Map

Short term Rental Narrative for 4945 E Wolf Lodge Dr. Eden UT 84310

Project Narrative:

This property was purchased as an investment property for family use and as a part-time nightly rental unit. Owners intend to rent to vetted nightly renters and stay at the property frequently to ensure it is properly maintained and well looked after. Owners intend to be long-term members of the Eden and Wolf Creek communities and are invested in their continued success and growth.

To address how any reasonably anticipated detrimental effects of a proposed conditional use can be substantially mitigated:

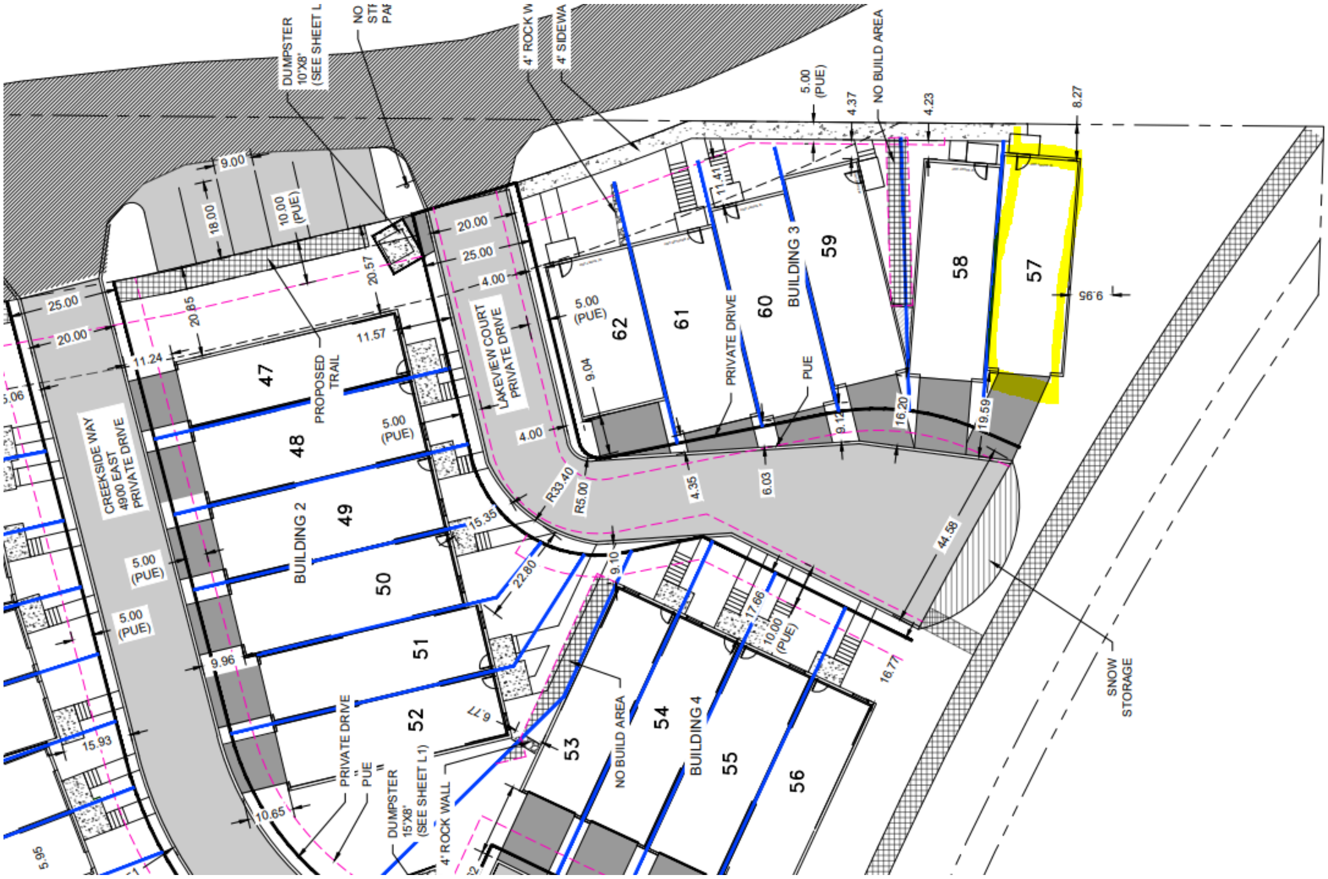
Noise: This townhome unit is not only a building end unit but a development end unit, so there is only one shared wall on one side and open ground on the other. Multiple noise tests conducted with the neighbors have proven this shared wall to be so well insulated for sound that no noise from the adjacent unit can be heard.

Security: A video doorbell monitors all activity in front of the unit and alerts the owners remotely. The garage door can be monitored as well as opened and closed remotely. There is a lockbox for access in case of emergency.

Parking: Every unit in this development has an attached garage with at least one parking space. 2 units have a 2-car garage. 17 units in the development have private driveway space, and at least 8 of those are large enough to park an additional vehicle. There are 18 paved and designated parking spaces with an additional 4 committed to by the builder, due in spring when landscaping is complete. This makes 59 spaces for 27 units, exceeding the 1.75 spaces per unit required by County Code. CCRs strictly prohibit the parking of trailers and recreational vehicles in the development, and the HOA actively enforces this. Please see the attached Parking Diagram for details.

Street Parking: Residents and visitors of the Village at Wolf Creek always use the designated parking spaces for the community. Most vehicles parked on the street are construction-related, and the ones always parked along Wolf Lodge Drive are from the Wolf Lodge and not related to the Village residents or visitors.

Garage Use: Garage will always be available for renter off-street parking. It is large enough to also provide storage for bikes or other recreational equipment.


CREEKSIDE WAY
4900 EAST
PRIVATE DRIVE
LAKEVIEW COURT
PRIVATE DRIVE
BUILDING 2
BUILDING 3
BUILDING 4
PROPOSED
TRAIL
NO BUILD AREA
PRIVATE DRIVE
PUE
DUMPSTER
15'X8'
(SEE SHEET L1)
4' ROCK WALL
SNOW
STORAGE
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