

SITE-SPECIFIC INVESTIGATION REPORT

SPRADLEY BARR DEALERSHIP

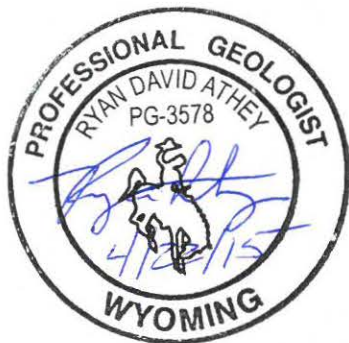
LARAMIE, WYOMING

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SUBMITTED BY: Trihydro Corporation

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Table of Contents

1.0	INTRODUCTION.....	1-1
2.0	SITE-SPECIFIC INVESTIGATION DATA.....	2-1
3.0	SITE-SPECIFIC INVESTIGATION CONCLUSIONS.....	3-1
4.0	REFERENCES.....	4-1



List of Figures

1. Site Location and Geology Map, Spradley Barr Dealership, Site-Specific Investigation, Laramie, Wyoming
2. Casper Aquifer Protection Area Boundary, Spradley Barr Dealership, Site-Specific Investigation, Laramie, Wyoming



List of Appendices

- A. FIELD INSPECTION PHOTOGRAPHS
- B. SPRADLEY BARR DEALERSHIP SITE PLAN
- C. CITY OF LARAMIE FLOOD MAP
- D. OPTIONS FOR SITE STORMWATER TREATMENT



1.0 INTRODUCTION

HONIWY, LLC (HONIWY) plans to purchase the property located at the northeast corner of Boulder Drive and Beech Street in Laramie, Wyoming. The property is currently owned by the City of Laramie (City) and is in the northern half of Section 2, Township 15 North, Range 73 West, as shown on Figure 1. The property lies within the boundaries of the Casper Aquifer Protection Overlay Zone (APO Zone) described in the *Casper Aquifer Protection Plan (CAPP*, Wittman Hydro Planning Associates 2008), which was approved by the City of Laramie on June 3, 2008. This site-specific investigation (SSI) report addresses the planned development in accordance with the requirements of Section 15.08.040.A of the Laramie Unified Development Code.

HONIWY plans to develop the property as an automobile dealership with a service garage. Per Section 15.08.040.A.6 – Prohibited Activity) of the Laramie Unified Development Code, automobile dealerships are a prohibited activity in the APO Zone. HONIWY has submitted an application for rezoning the property to be excluded from the APO Zone.

This investigation report was prepared by a professional geologist (required by Section 15.08.040.A.8.a) on behalf of HONIWY. The report identifies potential groundwater impacts from the proposed development (required by Section 15.08.040.A.8.b) and describes existing conditions, proposed activities, and applicable stormwater management techniques (required by Section 15.08.040.A.8.c).

2.0 SITE-SPECIFIC INVESTIGATION DATA

Information required in the site-specific investigation is presented in the Laramie Municipal Code, Section 15.08.040.A.d. The results from the site-specific investigation are presented below by the code citation, followed by the applicable investigation data or response.

1. A literature search to determine the presence of mapped faults, folds, fractures, and other evidence of conduit flow on the subject property: In conducting the literature search for this site-specific investigation, references reviewed/consulted include the following:

- Geologic maps of the area (Ver Ploeg 2009)
- City of Laramie GIS maps

During the literature search, two faults were identified to be in the vicinity of the property – the Sherman Hills fault and the Quarry fault. Both faults are east-west trending normal faults, with the southern side being the downthrown side of the fault. The locations of the faults, as mapped by Ver Ploeg (2009) in relation to the subject property, are shown on Figure 1. Both faults are located more than 100 feet from the subject property.

2. A Site narrative that includes historical information on previous land use, contaminant releases, abandoned wells, underground storage tanks, and septic systems as well as any other information relevant to the site: The subject property is currently owned by the City and is part of the Turner Tract. The property is currently undeveloped. There is a power line that crosses through the southwestern portion of the property. Also, there are a stormwater drainage channel and culvert located along the southern boundary of the property. Photographs of the subject property are presented in Appendix A. The location of the subject property in relation to the Casper Aquifer Protection Area is shown on Figure 2.

Based on a review of the Wyoming Department of Environmental Quality, Solid and Hazardous Waste Online database, a record of previous contaminant releases at the subject property was not identified.

3. A site plan showing the proposed use and zoning of the property including existing and proposed ground contours accurate to a two-foot interval as referenced to the USGS contour map for the area or other specified elevation standard as required by the City, and for a distance of at least five hundred feet beyond any proposed development activity, existing and proposed structures, parking areas, driveways, landscaping areas, setbacks, surface and subsurface drainage facilities, potential contaminant storage locations and methods of storage, above ground storage tanks, best management practices, utilities, roads, storm water management, and a vicinity map. Where necessary, specific construction details shall be provided to assure adequacy to accepted design standards: The site plan for the proposed development is presented as Appendix B. Existing conditions of the property include zoning,



utility locations, and ground surface contours. The property is zoned LM – limited manufacturing. Due to an overhead electrical power line that crosses the southwestern corner of the property, the proposed development is planned for the northern portion of the property. Figure B-2 shows the proposed locations of the planned building and parking lot. The drainage plan with proposed ground surface contours is presented on Figure B-3. The stormwater drainage plan is discussed further in Item 10 of this report.

4. Identification of potential contaminants and amounts stored, generated, or handled on the subject property: The proposed project is an automobile dealership with service garage. As such, the types of contaminants that will be stored on the property include new and used motor oil, antifreeze, and other solvents and lubricants used to maintain vehicles. Fuel (gasoline and diesel) will not be stored on the property. Additionally, household cleaning supplies will be stored in small quantities on site for use in the building.
5. A field inspection shall be conducted to verify the presence or absence of vulnerable features as defined in Section 15.08.040.A.8.d.v. A summary of the field inspection shall include a written report, maps identifying vulnerable features, and the distance and direction of the nearest well and vulnerable feature. Where subsurface wastewater disposal is proposed, the investigator shall conduct deep pit soil analysis to a depth at least five feet below the proposed bottom of the leaching system to establish that there are no obstructions such as bedrock, water table or other forms of refusal that could interfere with the proper functioning of the wastewater disposal system: A field inspection of the subject property was conducted on October 23, 2014, for the purpose of identifying site features, identifying current land use, and gathering information to be included in this site-specific investigation report. Photographs of the site are presented in Appendix A. As reported above, a stormwater drainage channel and culvert are located on the southern boundary of the property. Water is conveyed through the culvert to the south under Beech Street and into a detention pond on the south side of Beech Street.

The nearest wells to the subject property are the LCCC – WW No. 1 and No. 2 wells (Wyoming State Engineer’s Office (WSEO) Permit Number U.W. P170575W and P17076W). These wells are located on the property immediately north of the subject property owned by the Laramie County Community College in the northwest quarter of the northeast quarter of Section 2, Township 15 North, Range 73 West. The locations (to the nearest quarter-quarter section) of these wells are shown on Figure 1.

There is no subsurface wastewater disposal proposed for the building. Therefore, deep pit soil analysis was not conducted for this site-specific investigation. The dealership and service garage will use the existing City of Laramie sanitary sewer and water facilities, and, therefore, will not necessitate individual septic systems or water supply wells.

6. A map showing the area and types of exposed bedrock, marshes, perennial drainages, intermittent drainages, ephemeral drainages, creeks, and other bodies of water on the subject property: Figure 1 shows the location of

exposed bedrock surrounding the property. The southern portion of the property is covered by Quaternary alluvium and colluvium deposits. Satanka Shale is exposed along the northern portion of the property. Trihydro estimated the thickness of the Satanka Shale based on the dip and distance of the nearest Casper Formation outcrop east of the property. Using a dip of 3 degrees and a distance of 5,055 feet and accounting for the elevation change between the property and the outcrop, the estimated minimum thickness of Satanka Shale is 150 feet. This thickness exceeds the 75 feet indicated by the CAPP as providing protection from surface contaminants. The 75-foot thickness of Satanka Shale includes a safety factor of 50 percent as noted in the 2002 CAPP, as 50 feet was determined to be adequate for aquifer protection. The location of the 75-foot thickness of Satanka Shale in relation to the subject property is shown on Figure 2. This line represented the western boundary of Zone 2 of the 2002 CAPP. As shown, the subject property was not originally within 2002 CAPP Zone 2 boundary. As part of the 2008 update to the CAPP, the western boundary of Zone 2 was moved west to the nearest section or half section line to add yet another level of safety to the CAPP and allow for easier administration of affected lands. The subject property is within this revised boundary.

The nearest intermittent drainage is located approximately 120 feet south of the property. This drainage has been relocated from its original location and now crosses Beech Street further east than its original route. The engineered drainage spills into the detention pond located south of the subject property.

7. Where the 100-year flood plain mapping is unavailable, the professional geologist and/or engineer will calculate the 100-year floodplain for the drainage. The flood plain mapping will be provided on a site map with a scale not to exceed 1 inch equals 200 feet: Based on data from the Federal Emergency Management Agency Flood Plain mapping, effective October 16, 1996, the subject property is located outside of the 100-year flood plain as shown on the figure in Appendix C. The property is located outside the 500-year flood plain, as well.
8. An evaluation of the water supply and sewage system that includes the potential effects or risks of the system to the Casper Aquifer and its recharge area and the adequacy and safety of the systems. Items such as floor drains and plumbing schematics and the locations of potential contaminants, waste storage, and liquid transfer area locations shall be provided: The Spradley Barr building will be served by City of Laramie sanitary sewer and water utilities, and, therefore, will not necessitate individual septic systems or water supply wells. Water and sewer services will be connected to facilities located in Boulder Drive. These connections will be engineered in such a way as to limit the possibility of an undetected leak, such as double walled piping and pressure testing.

Floor drains in the service garage will be equipped with oil/water separators to capture oil and grease prior to discharge to the storm sewer. These oil/water separators should be maintained on a regular basis to remove accumulated oil and grease for transport off site. If used oil and grease is stored on site prior to transport to a

disposal facility, the storage area should have secondary containment to prevent the release of contaminants in the event of a spill from the primary container (drum).

9. A map(s) depicting the potentiometric surface of the Casper Aquifer at the subject property using data from historical water level measurements and published potentiometric surface maps. No new wells shall be drilled for the purpose of determining the potentiometric surface: The potentiometric surface map of the Casper Aquifer is shown on Figure 1. The potentiometric surface was generated based upon the water-level data gathered from the Laramie Water Management Study, Level II (Toboga 2006) in City monitoring wells 41T1, 41T2, SHMWW, and SHMWE. The potentiometric surface indicates that groundwater at the project site flows generally from east to west. Based on the thickness of Satanka Shale reported above, the depth to groundwater at the site is at least 150 feet. Based on the potentiometric surface data and the elevation of the property (7,315 feet above mean sea level), groundwater in a well would rise to within approximately 40 feet of ground surface at the subject property.
10. A surface water risk assessment and mitigation plan for any impacts caused by storm water runoff, retention and/or detention basins on the City water supply and the Casper Aquifer: Based on the proposed site plan (Appendix B), approximately half the property will be paved. The paved area will decrease the amount of infiltration to groundwater at this location. However, the volume of stormwater runoff will increase. The parking lot will be curbed around its perimeter to allow for containment of stormwater that may be potentially contaminated with hydrocarbons (oil and grease) accumulated from the parking lot. The stormwater from the parking lot will be captured in a stormwater separator, such as a Stormceptor or swirl concentrator described in Appendix D, prior to discharge to the detention pond located in the northwest portion of the property as shown on Figure B-3. The stormwater separator is designed to remove hydrocarbons from stormwater prior to discharge to the detention pond. The treated stormwater will discharge from the detention pond to the drainage channel located west of Boulder Drive. The drainage channel conveys water to Spring Creek, located west of the property.
11. A maintenance plan and agreement for any retention and/or detention basins and associated improvements will be required. Such plan and agreements shall be recorded in the Albany County Clerk's Office: The detention pond located north of the proposed development on the property serves to control drainage originating from the proposed parking lot. The stormwater separator described above should prevent contaminants from accumulating in the detention pond. However, Trihydro recommends that HONIWIY initiate periodic (every 5 years) sampling and testing of the soils in the detention pond to monitor changes in pond soil chemistry over time. Trihydro suggests at a minimum that testing be performed for gasoline and diesel range organics which can be done at a modest cost.

A maintenance plan for the detention pond is not needed now; however, a plan should be contemplated pending the outcome of soil testing. It is possible that chemical contamination will not concentrate at measureable levels in the

pond for several years, if at all. But, should contamination accumulate, possible maintenance could include periodic soil dredging or installing a membrane lining in the ponds.

12. A groundwater risk assessment and mitigation plan to respond to any evidence of contamination or vulnerability which is the result of the development. Such plan shall not limit the liability of any person for impacts to the Casper Aquifer: The thickness of Satanka Shale overlying the Casper Aquifer (approximately 150 feet) under the subject property is deemed adequate by the CAPP to provide protection from contamination to the Casper Aquifer. This protection, in addition to the lack of vulnerable features in the vicinity of the subject property, indicate that the risk of groundwater contamination from this property is low. As an added protection, the proposed development will use City municipal sanitary sewer and water facilities with connections that will be engineered in such a way as to limit the possibility of an undetected leak, such as double walled piping and pressure testing. Groundwater risks from these facilities are therefore low based on the information presented above, and a mitigation plan is not proposed for the subject property.
13. Demonstration of compliance with all applicable City Standards: During the design of the property, professional design services will be provided by architects and engineers registered in Wyoming. The design and construction plans will follow City of Laramie standard details. Plans and designs are subject to the City review process prior to approval.

3.0 SITE-SPECIFIC INVESTIGATION CONCLUSIONS

The proposed Spradley Barr development at the northeast corner of Boulder Drive and Beech Street includes the construction of an automobile dealership and service garage. This use is prohibited in Section 15.08.040.A.6 of the Laramie Unified Development Code. However, with proper engineering controls and management practices, the site likely poses a low risk to the Casper Aquifer. No vulnerable features were identified within 100 feet of the building. The thickness of Satanka Shale overlying the Casper Aquifer (at least 150 feet) is sufficient to prevent infiltration of contaminants to the Casper Aquifer. The subject property was not located within the original boundary of the 2002 CAPP, which was based on a determination of the thickness of Satanka Shale needed to protect the aquifer from surface infiltration. The CAPP boundary was revised in 2008 to follow section lines in this area and now includes the subject property. The parking lot will be curbed around its perimeter and Stormceptors or equivalents installed to facilitate removal of oil and grease that may accumulate in stormwater from the parking lot prior to discharging to an on-site detention pond and ultimately off the property. The building will be served by existing City of Laramie sanitary sewer and water services. These connections will be engineered to meet City standards to limit undetected leaks to the subsurface. Based on these findings, HONIWY has submitted an application for rezoning the property to be excluded from the APO Zone.



4.0 REFERENCES

Whittman Hydro Planning Associates. 2008. Casper Aquifer Protection Plan. City of Laramie, Wyoming.

City of Laramie/Albany County. Environmental Advisory Committee. 2002. Laramie Regional Drinking Water Protection Plan. An Aquifer Protection Plan for the City of Laramie, WY.

Federal Emergency Management Agency. 1996. Flood Insurance Rate Map – City of Laramie, Wyoming. Wyoming: Community Panel Number 560002 0005 D.

Toboga, Karl G. 2006. Laramie Water Management Study, Level II. Wyoming: Wyoming Water Development Commission Report.

Ver Ploeg, Alan J. 2009a. Geologic map of the Laramie quadrangle, Albany County, Wyoming: Wyoming State Geological Survey Map Series 50 (MS-50). Map scale 1:24,000. 1 sheet.

FIGURES

APPENDIX A

FIELD INSPECTION PHOTOGRAPHS

APPENDIX B

**SPRADLEY BARR DEALERSHIP
SITE PLAN**

APPENDIX C

CITY OF LARAMIE FLOOD MAP

APPENDIX D

OPTIONS FOR SITE STORMWATER TREATMENT