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Memorandum

To: Rocklin Unified School District
From: Matthew Gerken
Date: April 13, 2018
Subject: Rocklin Unified School District Elementary School #12 Pipeline Safety Hazards Assessment

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Rocklin Unified School District (RUSD) is proposing to construct and operate Elementary School #12 within a 10-acre property within the Whitney Ranch subdivision, which is under development in the City of Rocklin.

One large volume (12-inch diameter and larger) water pipeline was identified within 1,500 feet of the project site. Therefore, a water pipeline safety hazard assessment is recommended. This memo presents the results of the water pipeline safety hazard assessment prepared for the RUSD. It summarizes the applicable regulations, assessment methodology, and the pipeline location and operational data; provides the water pipeline flooding analysis; and determines the potential for flooding of the project site from pipeline rupture. This water pipeline safety hazard assessment was conducted as required by California Code of Regulations, Title 5, Section 14010(h).

Introduction

School Site Location

The project site is approximately 10 acres of undeveloped land located within the city of Rocklin. The project site is located within the 494-acre Whitney Ranch subdivision, which was proposed for development in phases. The project is part of Phase II, which is currently under development. It is located east of the intersection of future Whitney Ranch Parkway and West Oaks Boulevard, and west of the intersection of future Jamboree Drive and Lazy Trail Drive. Single-family homes are planned to be built immediately west, northeast, and east of the project site. An approximately five-acre park is scheduled for development south of the project site.

Applicable Regulations

Under Education Code Section 17251, the California Department of Education (CDE) has authority to approve acquisition of proposed school sites. The school district must obtain CDE approval for sites to receive State funds under the state's School Facilities Program administered by the State Allocation Board. CDE standards and regulations for this process are presented in CCR, Title 5, Sections 14010, 14011, and 14012. Information on assessing safety hazard related to pipelines is discussed in Section 14010 (h):

> *The site shall not be located near an above-ground water or fuel storage tank or within 1,500 feet of the easement of an above-ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study, conducted by a competent professional, which may include certification from a local public utility commission.*

No high pressure natural gas pipelines or hazardous liquid pipelines were identified within 1,500 feet of the project site.

Water Pipeline Safety Hazard Assessment

Assessment Methodology

To meet the requirements of CCR Title 5 Sections 14010 (d) and (h) and CDE's policy on pipelines, this water pipeline safety hazard assessment is designed to meet the following objectives:

- Identify all high pressure/high volume water pipelines within 1,500 feet of the proposed school site and evaluate the potential for flooding, and
- Where appropriate, identify and develop mitigation measures to reduce flooding impacts to acceptable levels.

The CDE has developed risk analysis procedures for evaluating flooding associated with releases from large diameter water pipelines, as described in CDE's *Guidance Protocol for School Site Pipeline Risk Analysis*.[1] A safety issue associated with large diameter water pipelines is the potential for flooding. Also, releases from underground water pipelines can cause subterranean erosion of saturated soil, leading to subsidence or formation of a sinkhole. The most likely cause of failure is a large magnitude earthquake and associated strong ground shaking.

Although no specific criteria have been established by the CDE as a threshold of significance for flooding at a project site, a water depth of 12 inches or greater is a trigger that could warrant further evaluation.

Pipe Location and Operational Data

One large volume (>12 inches) water pipeline is within 1,500 feet of the school site, according to the Placer County Water Agency (PCWA) (2018).[2] PCWA owns and operates a 36-inch water pipeline beneath an unpaved and unimproved portion of Whitney Ranch Parkway, approximately 340 feet north of the school site. The water pipeline is constructed of ductile iron and was installed in 2005. The water main is buried at approximately 3.3 feet below the ground surface (bgs) and operates at 100 pounds per square inch.

Water Pipeline Flooding Analysis

The CDE requires that the risk of releases from high volume water pipelines be evaluated. The CDE

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1 California Department of Education (CDE), 2007. Guidance Protocol for School Site Pipeline Risk Analysis, Prepared by URS Corporation. Dated February 2007.

2 Placer County Water Agency, 2018. PCWA Response to AECOM Information Request. Dated March 26, 2018.

G*uidance Protocol for School Pipeline Risk Analysis* provides a methodology for evaluating the potential for flooding. A probability analysis is not required.

Whitney Ranch Parkway currently exists as a four- to six-lane roadway from west of Wildcat Boulevard to Painted Pony Lane, and it would eventually be built as a six-lane facility from SR 65 to West Oaks Boulevard and as a four-lane facility from West Oaks Boulevard to Park Drive. In the vicinity of the project site, Whitney Ranch Parkway is unimproved and unpaved, and there are no curbs or gutters.

It is unlikely that any water released from failure of the 36-inch pipeline would reach the surface, since the pipeline is buried at least 3.3 feet bgs. However, for water pipelines which are not located beneath streets, the modeling approach from the CDE guidance manual assumes that all of the released water at a maximum flow rate reaches the surface and forms a circular pool with a water depth of 12 inches. Therefore, this analysis assumes all flowing water within the 36-inch pipeline in the vicinity of the project site would reach the surface.

Release impacts were calculated based on the procedures specified in the CDE manual. No credit was taken for the presence of future improvements to Whitney Ranch Parkway, including paving, curbing, and gutters, although these improvements will, in fact, be in place. The release rate was determined by multiplying the pipe area by an assumed velocity of 5 feet per second (fps). As shown in the table below, the radius of a 12-inch high circular pool would be approximately 116 feet from the centerline of the 36-inch water main. Because the project site is 340 feet from the 36-inch water main, a surface release from this water main would not impact the school site.

PIPELINE DIAMETER	PIPELINE LOCATION	RELEASE RATE (CFS)	Impact Distance for Circular Pool (ft)	Distance from School Site (ft)	Impacts to School Site?
36-Inch	Whitney Ranch Parkway	35.1	116	340	No

Conclusion

The results from this analysis indicate that releases from the 36-inch pipeline would not result in released water entering the project site. Whitney Ranch Parkway will be built as a four-lane facility from West Oaks Boulevard to Park Drive as more development occurs in the project area. It is likely that when Whitney Ranch Parkway is improved, any releases from the broken water main would be entirely contained within the confines of the street. Therefore, a potential break in any of the water pipeline located within 1,500 feet of the site would not result in flooding at the project site.