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**Subject: CEQA SUPPORT FOR SECTION VII – GEOLOGY AND SOILS
WASTE DISPOSAL INC. SUPERFUND SITE REDEVELOPMENT
12731 East Los Nietos Road
Santa Fe Springs, California**

1. INTRODUCTION

Presented herein is Tetra Tech BAS GeoScience (Tetra Tech) geotechnical review of geologic hazards for the proposed redevelopment of the existing Waste Disposal Inc. (WDI) Superfund Site located at 12731 East Los Nietos Road, at the northwest corner of the intersection between Greenleaf Avenue and Los Nietos Road in Santa Fe Springs, California. The purpose of this report is to provide information required for Section VII – Geology and Soils, for the California Environmental Quality Act (CEQA) site assessment.

2. GEOLOGIC AND GEOTECHNICAL HAZARDS

The following information is being provided to support each of the responses required by the CEQA questionnaire for Section VII – Geology and Soils. The filled-out form for this CEQA section is included in Appendix A. For ease of reference, the original questions from the CEQA questionnaire and the corresponding responses are included below.

CEQA Section VII

- a. *Would the project directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:*
 - i. *Rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

Response: No impact.

Justification: Official Maps of Earthquake Fault Zones were reviewed to evaluate the location of the project site relative to active fault zones. Earthquake Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act enacted in 1972. The Act directs the State Geologist to delineate the regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The purpose of the

Alquist-Priolo Act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

The site is not located within a designated Earthquake Fault Zone for fault surface rupture hazard. Based on a review of State of California Earthquake Fault Zone maps, the closest zoned fault for surface rupture is located within the Whittier-Elsinore Fault Zone – located approximately 3 miles north northeast of the site (CDMG, 1999).

No surface traces of active or potentially active faults are known to pass directly through or project towards the site. Neither our field exploration nor the reviewed literature disclosed an active fault trace projecting to the ground surface in the project area.

ii. *Strong seismic ground shaking?*

Response: Less than significant impact with mitigation incorporated.

Justification: Southern California is known to be seismically active. Earthquakes occurring within approximately 60 miles of the site are generally capable of generating ground shaking of engineering significance to the proposed construction. The project area is located in the general proximity of several active and potentially active faults. Active faults are defined as those that have experienced surface displacement within Holocene period (approximately the last 11,000 years). The closest active faults to the site include the Whittier fault located approximately 3 miles north northeast of the site, and the Newport-Inglewood-Rose Canyon fault zone (north Los Angeles basin section) located approximately 12 miles southwest of the site. The San Andreas Fault is located about 35 miles to the northeast of the site. Based on the SEAOC website application (<https://seismicmaps.org/>), the PGA from the Design Response Spectrum at the site is approximately 0.57g. All structures and foundations at the site will be designed to accommodate the 2016 California Building Code recommended Design Spectrum.

iii. *Seismic-related ground failure, including liquefaction?*

Response: No impact.

Justification: Maps of seismic hazard zones are issued by the California Geological Survey (CGS, formerly California Department of Conservation, Division of Mines and Geology (CDMG)) in accordance with the Seismic Hazards Mapping Act enacted in April 1997. The intent of the Seismic Hazards Mapping Act is to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in developing compliance requirements to protect the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes.

Based on the review of the Whittier Quadrangle Official Map of Seismic Hazard Zones released March 25, 1999, the proposed development is not located within an area identified by the State of California as subject to the hazard of liquefaction.

Furthermore, the encountered soil materials below the mapped groundwater generally consisted of dense to very dense coarse-grained alluvial deposits made up of poorly-graded sands and silty sands interspersed with layers of very stiff and hard lean clays and silts that are not susceptible to liquefaction as mapped in the Seismic Hazard Zones Map. Thus, liquefaction is not considered a hazard at this site. However, for completeness a rigorous liquefaction analysis was performed to evaluate the potential for liquefaction triggering and possible induced seismically induced ground deformations. The estimated total settlements due to seismic shaking were estimated to be less than 0.7 inches and the corresponding differential settlements due to seismic shaking were estimated to be less than 0.4 inches which can be easily accommodated by structural design meeting the 2016 CBC requirements. In addition, the proposed building foundations will be supported on rigid foundation elements extending to a depth where dense and very dense non-liquefiable native soils are encountered. Therefore, the analyses and the proposed design corroborate that liquefaction is not a hazard at the site.

iv. Landslides?

Response: Less than significant impact.

Justification: Based on the review of the Whittier Quadrangle Official Map of Seismic Hazard Zones released March 25, 1999, the proposed development is not located within an area identified by the State of California as subject to the hazard of landslides due to seismic shaking. Fill slopes up to 13 feet high are proposed for site development. The slopes and retaining walls will be designed to be statically stable and to withstand the forces generated by the design ground motions.

b. Result in substantial soil erosion or the loss of topsoil?

Response: No impact.

Justification: The site is currently an open field space. The project will include pavements and provide drainage control that will improve the resistance against erosion and loss of topsoil.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Response: Less than significant impact with mitigation incorporated.

Justification: The soils at the site are not prone to liquefaction. Furthermore, due to the low risk of liquefaction lateral spreading is not considered to be a hazard to the site. Wastes disposed of at the site include petroleum-related chemicals, solvents, sludges, construction debris, drilling muds, and other waste materials. Therefore, the potential of subsidence of the materials within the upper 20 to 25 feet is high under the proposed building surcharges. In order to minimize the impact of this subsidence on the stability of the proposed building the following two remedial measures will be implemented to mitigate this risk:

- i. A surcharge program will be implemented which will entail placing soil fill loads in excess of the design loads over the building footprint in order to compress the subgrade materials before construction takes place.
 - ii. Deep rigid foundation elements (e.g., rigid inclusions or similar) will be built along the perimeter footings and the interior column footings to transmit the vertical loads from the superstructure to the dense coarse-grained materials below the waste materials. Rigid inclusions in general transfer loads through weak strata to a firm underlying stratum using high modulus, controlled stiffness columns, thereby increasing bearing capacity and minimizing settlement.
- d. *Be located on expansive soil as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?*

Response: No impact.

Justification: A total of 6 expansion tests were performed on representative soil samples at the site. The Expansion Index ranged between 9 and 15 indicating very low expansion potential.

- e. *Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?*

Response: No impact.

Justification: This item is not applicable since there are existing sewer systems to which the proposed building wastewater effluent will be conveyed to.

- f. *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*


Response: No impact.

The site is a landfill and there no known paleontological resources at the site.

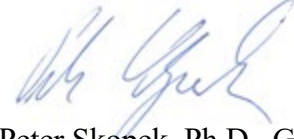
3. CLOSURE

We appreciate the opportunity to provide our professional services on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
Tetra Tech BAS GeoScience


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Attachments: Appendix A – CEQA form

Filename: WDI CEQA Geology and Soils RPT 2019-07.docx

**APPENDIX A
CEQA FORM**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VI. ENERGY. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VII. GEOLOGY AND SOILS. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

VIII. GREENHOUSE GAS EMISSIONS. Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

X. HYDROLOGY AND WATER QUALITY. Would the project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>