



Geotechnical and Environmental Consulting Services

December 3, 2021

Sentinel Peak Resources
5640 South Fairfax Avenue
Los Angeles, California 90056

Attention: Mr. Daniel D. Taimuty
EH&S Compliance Manager

Subject: Geotechnical and Engineering Geology Evaluation
Baldwin Hills Community Standards District
2021 Annual Ground Movement Survey
Inglewood Oil Field 2020 Production Year

Dear Mr. Taimuty:

Sentinel Peak Resources has asked Laguna Geosciences, Inc. to perform a Geotechnical and Engineering Geology evaluation of the results of the 2021 Annual Ground Movement Survey (2020 Production Year) in regards to regional uplift and subsidence. The ground movement survey is performed in general compliance with the Baldwin Hills Community Standards District Environmental Impact Report requirements for the operation of the Inglewood Oil Field which is located in the Baldwin Hills area of Los Angeles, California.

This letter report summarizes our analysis of ground survey and satellite data that bear upon the amount of vertical and horizontal ground surface movement that occurred during the Inglewood Oil Field 2020 production year. It should be noted that the production season for this campaign included July 1, 2020 through June 30, 2021. We specifically analyzed the ground survey data provided by PSOMAS (2021), and the Interferometric Synthetic Aperture Radar (InSAR) surveys provided by CGG (2021).

Based on comparison of the 2020-2021 PSOMAS ground survey data:

- Six of the monuments indicated uplift of more than 0.6 inches, with four out of the six being original/twin monuments (meaning two of the monuments were twinned in 2014 as described in LGI's report dated December 30, 2020). If the original, suspect monuments are not included, only 4 monuments indicated uplift of more than 0.6 inches.
- None of the monuments decreased in elevation more than 0.6 inches over the 2020-2021 time period

- The maximum elevation increase was 1.13 in./yr. at Monument 110 in the central part of the Baldwin Hills Community Standards District (BHCS D); the maximum decrease was -0.41 in./yr. at Monument 140 outside and to the north of the BHCS D. It should be noted that Monument 140 was established in July of 2020 because the original monument (133) was destroyed by construction. Monument 132, also located outside the BHCS D to the north, and had the second highest decrease (-0.17 inches), but it is also a twin. Excluding previously twinned monuments, the maximum elevation decrease was -0.12 in./yr. at Monument 136 also located outside the BHCS D
- The maximum horizontal movement was located at the northeast boundary of the BHCS D at Monuments 117 with movement of 1.04 in./yr. The second highest horizontal movement was noted at Monument 50004 and its twin 303.
- In general, most of the monuments west of the mapped surface expression of the Newport-Inglewood fault zone about moved to the west, with about half of the monuments moving in a predominantly north-westerly direction and half moving south-westerly. However, several monuments near the northwest boundary of the BHCS D moved in a north-easterly direction.
- In general, all of the monuments east of the fault zone moved in a easterly direction with a mix of the monuments moving in northeasterly and southeasterly directions.
- The cumulative vertical ground movement for the 2010 through 2021 surveys indicates the maximum cumulative elevation decrease since 2010 is -3.83 inches at Monument 50004. However, it should be noted that Monument 50004 was twinned with 303 in 2014 because Monument 50004 was considered suspect due to near surface conditions. If data from the monuments that were twinned is ignored, the maximum cumulative elevation decrease since 2010 is -2.39 inches at Monument 126.
- The maximum cumulative elevation increase since 2010 is 1.85 inches at Monument 128, located outside the BHCS D.

Based on the 2019-2021 InSAR data:

- There was a reversal of the subsidence trend observed in the previous year's report within the oilfield region. Vertical movement is now characterized by uplift within the BHCS D. Uplift in the northwest and southeast indicates a maximum of approximately 1.5 and 0.9 inches, respectively, and the uplift extends beyond the boundary of the BHCS D.

- There was also an extension outwards away from the center of the vertical uplift feature. The maximum rates are approximately 1.2 inches in the westerly direction and 0.8 in the easterly direction. It is noted that the InSAR survey does not measure north/south movement.
- Cumulative vertical displacement of approximately -3.3 inches (subsidence) has been observed from October 2010 to June 2021, predominately located in an ellipse shaped area within the BHCSO, with a north-west/south-east orientation, and with two distinct maximum areas. These maximum areas have generally shifted towards the south-east since 2010.

The ground movements observed in current and past AGMS as summarized above are relatively small, and taken in context with other regional ground movement in southern California, are not excessive.

It is LGI's recommendation that monitoring of the BHCSO and geotechnical and engineering geology evaluations of individual property damage claims continue as outlined in the Baldwin Hills Community Standards District (BHCSO) Environmental Impact Report (Marine Research Specialists, 2008). This monitoring allows Sentinel to continue to be proactive and helps identify where current processes are effective and where changes could be beneficial.

For readers who are not familiar with potential geotechnical causes of ground movement and historical movement within the vicinity of the Baldwin Hills, please see previous summaries and analysis in reports by Laguna Geosciences, Inc. (Laguna Geosciences, Inc., 2014-2020).

The work has been objectively conducted in accordance with generally-accepted professional practice standards for this type of work by California Professional Registered Engineers and Geologists. LGI believes the analysis performed and the conclusions and recommendations developed to be accurate and relevant. However, certain information contained in this report may have been rightfully provided to LGI by third parties or other outside sources. LGI does not make any warranties or representations, whether expressed or implied, regarding the accuracy of such information, and shall not be held accountable or responsible in the event that any such inaccuracies are present.


The judgments, conclusions, and recommendations described in this report pertain to the conditions judged to be present or applicable at the time the work was performed. Future conditions may differ from those described herein and this report is not intended for use in future evaluations of the Site. This report has been prepared solely for the use of Sentinel Peak Resources, its agents, and its legal counsel, as it pertains to the Site. The purpose of this analysis was to assess the movement in relation to oil field activities from a Geotechnical Engineering and Engineering

Geology point of view. Any reliance on, or use of, this report by any third party shall be at such party's sole risk.

Please do not hesitate to contact LGI if you have any questions regarding this report or any other matter.

Sincerely,

Laguna Geosciences, Inc.


Matthew F. Hunter, P.E., G.E., C.E.G.
Principal Engineer





Rachel Martinez, P.G.
Principal Geologist