GeoEngineers

MEMORANDUM

Tacoma

TO: Rolf Stopsack, Pacific Hansa

FROM: William Halbert, Terry Parks

DATE: March 20, 2000

FILE: 3890-004-00

SUBJECT: Results of Subsurface Explorations, Coski Property

GeoEngineers is pleased to provide this memorandum regarding our subsurface investigation at the former Coski Industrial Landfill located between 19th Street East and 12th Street East, west of 58th Avenue Northeast in Tacoma, Washington. The site is located near the top of a bluff that overlooks Marine View Drive and the eastern portion of Commencement Bay. We understand that the site was used as an unpermitted disposal site for construction and woodwaste debris from approximately 1970 until 1982. We understand that bilge-oil, roofing plant waste and petroleum-treater clay was also dumped at the site. We understand that Pacific Hansa, Inc. is interested in purchasing the site for development into residential homesites. The general outline of the proposed development is shown in the Site Map, Figure 1.

Our services were performed in general accordance with our proposal dated January 21, 2000. The chemical analytical portion of our services was suspended following the discovery of large amounts of wood waste in the fill soil on the site.

GeoEngineers excavated 14 test pits on the subject property using a Case 690 hydraulic excavator. The locations of the test pits are shown in the Site Map, Figure 1. Test pits were excavated to depths ranging from 7 to 19 feet below ground surface. Our staff geologist was present to log the materials encountered in the test pits, obtain representative soil samples for possible chemical testing, and monitor organic and combustible vapors encountered in the test pits.

Fill, consisting of soil and debris, was encountered in 11 test pits and ranged in thickness from 5 to 17 feet. The fill contained a mixture of debris including car parts, drywall and construction debris, rubber hoses, metal and pipes, tires, drums, and asphalt and concrete pieces. The fill also contained from 10- to over 30-percent organic debris consisting of wood waste and stumps. The fill material appeared to be relatively loose to moderately dense and did not appear to have been compacted during placement. Combustible vapors were encountered in the test pits at concentrations as great as 1,000 parts per million. Our test pit logs are included as attachments to this memorandum.

The presence of debris, primarily organic debris, in the fill soil will require extensive over excavation, segregation and disposal of unsuitable material, and replacement with structural fill to make suitable homesites and roadways. Organic debris should be expected to decompose over time and soil containing organic debris should be expected to settle over time. Soil settlement may cause failure of typical spread-footing foundations, cracking and warping of roadways, possible rupture of utilities and changes in the site drainage. Combustible organic vapors from the decomposing soil may collect in crawlspaces or

basements of houses, or utility vaults and create a safety hazard. Based on the soil conditions observed by GeoEngineers in our exploratory test pits, it would appear that the costs associated with developing the site as a residential subdivision would be much higher than for other properties in the Tacoma area.