INFORMATION SHEET

ORDER NO. R5-2012-XXXX
CITY OF REDDING
FOR POST-CLOSURE MAINTENANCE
BENTON CLASS III MUNICIPAL SOLID WASTE LANDFILL
SHASTA COUNTY

The City of Redding owns and maintains the closed Benton Class III Municipal Solid Waste Landfill, located on the west side of Redding, Shasta County. The landfill began operations as an open burn dump in the early 1930's in a canyon adjacent to the Linden Creek drainage. In the early 1960's, sanitary landfill practices were implemented and filling of the canyon began. The landfill ceased disposing of waste in 1990. Installation of a final cover system was completed in 1995. Over the life of the landfill, approximately 1,964,000 cubic yards of waste were disposed.

The landfill consists of one closed unlined waste management unit (Unit) covering approximately 118 acres of the 450 acre site. A dendritic underdrain leachate collection system underlies the eastern 1/3 of the landfill Unit. The leachate collection system discharges directly to the City of Redding sewer system. An active perimeter and infill gas extraction system with flare operates at the facility. The infill portion of the gas extraction system collects landfill gas from the leachate collection underdrain system. A community airport is located directly north of the landfill, and the southern end of a runway safety overrun is being constructed over a portion of the landfill Unit. Construction of the runway safety overrun includes installation of a 60-mil low linear density polyethylene liner and Geogrid drainage system beneath the runway over the portion of the Unit affected by the project.

The landfill is located on the western edge of the Redding basin, the northern most sub-basin of the Sacramento Valley basin. Bedrock underlying all geologic units beneath the site is Copely Greenstone. The Red Bluff Formation is the primary

geologic unit underlying wastes at the site and consists of well-rounded and indurated boulder-to-pebble conglomerate in a reddish brown matrix of sand, silt, and clay.

On the west side of the landfill (hydraulically upgradient), groundwater is characterized by a "perched" zone in the Red Bluff Formation, while on the east side (hydraulically downgradient), groundwater occurs within multiple zones separated by cemented strata confined within the Tehama Formation. Groundwater at the east side of the landfill tends to be artesian. Eight monitoring wells make up the groundwater detection monitoring system. An additional 18 groundwater monitoring wells exist at the site, but these are not used in the current monitoring system. Based on groundwater elevations, it's possible that wastes are in contact with water at various times of the year. Surface water flow from the landfill is toward the Linden Creek drainage, which is tributary to the Sacramento River.

Trilinear diagrams and stiff patterns of major ions indicate differences between leachate, well OB-3B, background wells OB-1 and OB-2, and downgradient wells OB-4, OB-5, OB-6 and OB-8, and crossgradient well OB-23. The trilinear diagram shows three general groupings of the data. Downgradient wells at the toe of the landfill plot together and can be classified as having no dominant cation - bicarbonate type. Background wells OB-1 and OB-2 can be classified as calcium - bicarbonate type, while crossgradient well OB-23 and leachate can be classified as magnesium - bicarbonate type. However, there is overlap between the background wells, OB-23, and leachate. Wells OB-3 (replaced by OB-3A) and OB-3A (replaced by OB-3B) can be classified as calcium + magnesium - bicarbonate type. Well OB-3B plots differently than the other groupings, and can be classified as magnesium - chloride type. The main difference between OB-3B and other wells and leachate is the anion type; OB-3B has chloride as the primary anion, while all other wells have bicarbonate as the main anion. The shape of stiff patterns also illustrates the differences between OB-3B and the other wells and leachate, with OB-3B having relatively higher chloride than any other pattern.

The Discharger's evaluation of water quality in the vicinity of upgradient well OB-3B suggests that potential non-landfill influences may be affecting background water quality. Well OB-3B was installed in summer 1999 to replace well OB-3A, which was closer to the landfill Unit and exhibited elevated constituent concentrations compared to other background wells. The Discharger's consultant suggested that elevated mineral constituents in OB-3A could have been caused by a combination of landfill influence and the composition of the well seal. Detections of VOCs in OB-3A were interpreted as representing landfill gas migration, since OB-3A is located between the Unit and the perimeter gas-control system header. Additionally, it was suggested that chemical reactions between landfill gas and the well seal were causing calcium and other parameters to be elevated. This resulted in OB-3A being judged inadequate as a background monitoring point, and as a result, OB-3B was installed further away from the landfill. Since its installation, OB-3B has shown some similar characteristics as OB-3A, with increasing trends for chloride and various low concentrations of VOCs including MtBE. The Discharger suggests that influences on groundwater quality in OB-3B may be related to pollution from underground storage tanks that were located nearby at City of Redding Fire Station No. 2. These tanks were removed in 1989. This Order requires the Discharger to further investigate potential non-landfill influences on groundwater quality in the vicinity of well OB-3B.

This Order revises Waste Discharge Requirements Order No. 91-117 and implements applicable provisions of Title 27. This Order also requires the Discharger to evaluate the effectiveness of the final cover system at reducing the saturated interval within the waste pile and also to investigate low-concentration volatile organic compound detections in groundwater at the hydraulically upgradient portion of the landfill (thought to be caused by non-landfill impacts).