



Update on Water Quality Impacts from the Emergency Disposal of Mudslide Material

by Santa Barbara Channelkeeper

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In the wake of the devastating Thomas Fire in December 2017 and the storm and ensuing flooding and mudslides on January 9, 2018, Santa Barbara Channelkeeper and various agencies have been monitoring potential impacts on water quality. Below is a summary of current conditions and recent sampling results.

Ocean Bacteria Testing and Beach Safety

Both Channelkeeper and the Santa Barbara County Public Health Department are conducting regular sampling of fecal indicator bacteria levels at and near beaches where mud from the fire and flood areas is being deposited. Results indicate that levels of indicator bacteria are extremely high and exceed state standards designed to protect public health in the vicinity of mud disposal locations at Carpinteria Beach at Ash Street, Goleta Beach, and Hammonds Beach. Goleta Beach, Carpinteria City and State Beaches, and Hammonds Beach are currently closed. Arroyo Burro and Hope Ranch Beaches are currently posted with official warnings due to exceedences of fecal bacteria standards. Channelkeeper's daily sampling at both Rincon and Campus Point beaches indicates that the water at these locations is less contaminated than at disposal beaches, though public health standards are still being exceeded. Click [here](#) to view the County's beach sampling results, and follow Channelkeeper on [Facebook](#), [Twitter](#) and [Instagram](#) to get our results.

Dr. Trish Holden from UCSB's Bren School of Environmental Science and Management is working on a special study to determine how much of the fecal bacteria in the water at Goleta Beach is from human sources rather than animals. Contamination from human waste is considered a higher health risk for humans than contamination from animal waste.

Chemical Testing of Mud

The Central Coast Regional Water Quality Control Board is currently requiring that the County conduct sampling of sediment (mud) and submit weekly reports of the results. The County has sampled mud being deposited on Goleta and Carpinteria Beaches. The results from January 23, 2018 are summarized below. Contaminants detected above relevant health or environmental protection standards are bolded.

Goleta Beach

Ammonia – Detected at levels potentially harmful to aquatic and marine species. Ammonia is produced naturally due to decomposition of organic material (leaves, wood, ash, bacteria, etc.) in wetlands. It is commonly mobilized when soils from wetlands are excavated. Pulses of ammonia are also known to occur in watersheds after wildfires. Ammonia dissipates rapidly in moving, well-mixed water.

Heavy metals – Detected at low levels expected naturally in soils.

Gasoline, Diesel, Motor oil – Trace amounts of gasoline were detected.

Polynuclear Aromatic Compounds (common byproducts of wildfires) – detected at trace levels generally below established environmental standards.

Pesticides – **DDT** detected in low concentrations but above the Probable Effects Level standard (established to predict potential ecological effects in marine sediment). DDE also detected above minimum screening levels established to predict likelihood of ecological effects. Trace amounts of Dieldrin (an insecticide) also detected.

Polynuclear Aromatic Compounds (common byproducts of wildfires) – detected at trace levels generally below established environmental standards.

Carpinteria Beach

Ammonia – Detected at levels potentially harmful to aquatic and marine species. Ammonia is produced naturally due to decomposition of organic material (leaves, wood, ash, bacteria, etc.) in wetlands. It is commonly mobilized when soils from wetlands are excavated. Pulses of ammonia are also known to occur in watersheds after wildfires. Ammonia dissipates rapidly in moving, well-mixed water.

Heavy metals - Detected at low levels expected naturally in soils

Gasoline, Diesel, Motor Oil – Not detected

Pesticides – Not detected

Polynuclear Aromatic Compounds (common byproducts of wildfires) – detected at trace levels generally below established environmental standards.

Additional Mud Sampling

Bulk mud sampling was requested by Monterey County Regional Fire District in order to determine if workers could potentially be exposed to hazardous substances while performing recovery and clean-up operations. Sampling targeted areas in Montecito near destroyed homes where workers would have the greatest potential for exposure. Results reported on January 18, 2018 are summarized here:

Asbestos – Not detected

PCBs – Not detected

Heavy metals – Detected at low levels expected naturally in soils

Gasoline, Diesel, Motor Oil – Detected at low levels generally below standard soil cleanup standards

Fecal bacteria – Detected at very high levels in excess of public health standards

Toxicity Testing of Mud

Channelkeeper collected samples of mud from Carpinteria and Goleta Beaches and submitted them to Aquatic Bioassay and Consulting Laboratories in Ventura to test for toxicity. The laboratory performed a bioassay test (similar to the concept of a “canary in a coal mine”) in which it exposed a species of marine mussel (*Mytilus galloprovincialis*) to the sediment for a period of several days to determine if there is any toxicological effect over that duration. 100% mortality was observed in both samples. The toxicity test does not determine which specific chemical or condition causes toxicity, however, from the chemical analysis and additional measurements that have been performed, we can presume that ammonia levels and oxygen depletion are likely associated with the mortality. Toxicity due to ammonia levels and oxygen depletion is not a risk for human health, but it may impact invertebrates (sand crabs, etc.) and fish in wetlands, the beach and the surf zone. These conditions are most likely the result of dredging activities and/or wildfire, which can mobilize ammonia in watersheds, rather than a result of contamination from destroyed structures or utilities. Channelkeeper predicts that toxic effects are

limited to the wetlands and sandy beach area where material is being deposited. It is uncertain how far out into the surf zone organisms may be impacted, however we predict that currents, tides, and wave action induce mixing and oxygenation that reduces the ecological impact relatively quickly.