
Central Coast Regional Water Quality Control Board

September 25, 2013

Ms. Linda Stedjee
lstedjee@charter.net

Sent via electronic mail only

Dear Ms. Stedjee:

RESPONSE TO JULY 2013 EMAIL RE: NITRATE CONCENTRATIONS IN GROUNDWATER, MORRO BAY, SAN LUIS OBISPO COUNTY

We appreciate your concern about nitrate pollution in the City of Morro Bay's drinking water wells, and bringing to our attention that nitrate concentrations have continued to increase since Cleath and Associates' 2007 report, submitted on behalf of the City. However, we do not agree with your argument, provided in an email to Mr. Kurt Souza with the California Department of Public Health dated July 8, 2013, that the primary source of the nitrate is sewer exfiltration, in particular, from sewer lines located in the vicinity of the former Shell Station located at the northeast corner of Highway 41 and Highway 1. Our conclusion is unchanged: the primary source of the nitrate pollution is chemical fertilizers applied to row crops in lower Morro Valley. The new hydrogeologic/chemical information you provided, including the City's pumping rates, nitrate concentrations in supply wells, rainfall averages, and analyses of nitrate isotope results, does not change our conclusion.

We have taken and continue to take action regarding nitrate discharges from chemical fertilizer application. The City has appropriately addressed the nitrate in its supply wells so that delivered water meets drinking water standards. We have no information indicating that there are discharges of nitrate from the area to local surface waters or the ocean. We discuss each of these items in further detail below.

Hydrogeologic/Chemical Information

Your email asserts that rainfall rates are not a significant factor in nitrate levels, rather the nitrate concentrations are directly related to total well field production from the City's four supply wells, and that the reason for higher concentrations in the northern-most well (MB-3) is that the source for the nitrate is sewer exfiltration north and west of this well, and work related to site cleanup work at the former Shell Station has breached clay layers and created a conduit for nitrate transport to the City's wells. In addition, you assert that the southern-most City wells have lower nitrate concentrations because of dilution and that Cleath's 2007 report inaccurately interprets the isotopic analysis of nitrate detected in the City wells. Water Board staff's responses are as follows:

- Our analyses of pre-2007 data on Morro Creek flows, rainfall, well drawdown, well production, and nitrate concentrations, along with new data on well production, rainfall, and nitrate concentrations provided in your July 8, 2013 email, indicate that there is a

yearly cycle and strong inverse correlation between nitrate concentrations and creek flows. The ephemeral creek begins to flow after significant rainfall events. The well field induces groundwater recharge from the creek (as designed), thus diluting nitrate in groundwater from Morro Valley, especially groundwater captured by southern-most supply wells located nearest the creek. The recent data provided by you indicates overall declining production from the well field over the period from 2009 to present; however, nitrate concentrations have increased during that time. In terms of water balance, the City's wells get nearly all of their water from 1) groundwater flowing from Morro Valley through the narrows towards the ocean and 2) induced recharge from Morro Creek. The area beneath the former Shell Station is adjacent to bedrock (a poor source for significant quantities of groundwater) and separated from sand/gravel units tapped by the City's wells by thick layers of clay and silt (thus the City's wells are likely hydraulically disconnected from the former Shell Station area as evidenced by lack of methyl tertiary-butyl ether (MTBE) detected in the City's wells).


- In the absence of significant creek flows (i.e., drought years), there is a greater lowering of the water table, higher drawdown per unit production from the well field, thus higher proportion of production from upgradient (e.g., lower Morro Valley) sources of groundwater that have demonstrated high nitrate concentrations. This, coupled with the fact that recent (2011) data from groundwater wells in lower Morro Valley indicate maximum nitrate concentrations had increased to above 300 micrograms per liter (from the low 200 micrograms per liter in 2007), continues to support the conclusion that the primary source of nitrate is from the lower Morro Valley. Concentrations of nitrate in the City's wells have increased in response to the above factors. In response to better nutrient management in the lower Morro Valley, we expect the trend to reverse after nitrate, stored in the unsaturated zone below the row crops and in groundwater between the City's wells and lower Morro Valley, is flushed out over the next few years.
- As stated in Cleath's 2007 report, nitrate isotopic data do not allow a conclusive determination of whether the nitrate contamination is derived exclusively from sewer exfiltration or exclusively from nitrate fertilizer application because the nitrate isotopic signature could be the result of 1) mixtures of sewer exfiltration and nitrate fertilizer applications, 2) mixtures of nitrate and ammonium fertilizer applications, or 3) exclusively from ammonium fertilizer applications. We concur with their conclusion.

Morro Valley Nutrient Monitoring

The Central Coast Water Board's Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Agricultural Order No. R3-2012-0011) requires individual ranches and farms to conduct surface water and groundwater quality monitoring in agricultural areas and to identify areas at greatest risk for nitrogen loading and exceedance of drinking water standards. In addition, farms meeting criteria for higher threat to water quality are also required to evaluate nitrate loading and provide irrigation and nutrient management reporting. Growers must implement irrigation and nutrient management practices to control discharges to waters of the State. Initial groundwater monitoring results and nitrogen loading data for the Morro Valley Basin are still being collected and reported.

Thank you for your communication and concern regarding the water quality in the Morro Bay area. In addition to the nutrient management work, the Central Coast Water Board is also working closely with the City on the upcoming wastewater treatment plant upgrade project. The Water Board believes through these types of projects and work, the vision of healthy, sustainable watersheds will be achieved.

Sincerely,

 Digitally signed by Kenneth A Harris Jr.
DN: cn=Kenneth A Harris Jr., o=Central
Coast Regional Water Quality Control
Board, ou=Executive Officer,
email=Ken.Harris@waterboards.ca.gov
, c=US
Date: 2013.09.25 16:01:00 -07'00'

Kenneth A. Harris Jr.
Executive Officer

cc:

Kurt Souza, CDPH-DDWEM-DWFO, kurt.souza@cdph.ca.gov

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