



Pure Water Monterey  
A Groundwater Replenishment Program

# WILL LEGACY PESTICIDES AFFECT OUR FUTURE WATER SUPPLY?

## A BIG STEP: TREATING IMPAIRED WATERS

As a component of the Pure Water Monterey Program, the Blanco Drain Diversion Project will collect and treat impaired runoff from over 6,400 acres of agricultural lands. These surface waters have been identified as a source of recyclable water that can further reduce the Monterey County's dependence on groundwater pumping.

As proposed, a diversion structure will send water flows to the Regional Treatment Plant where they will receive primary and secondary wastewater treatment. A portion of the flows would then undergo additional treatment at the Pure Water Monterey advanced water purification facilities before being injected into the groundwater basin on the Monterey Peninsula. The Pure Water Monterey Program will also provide additional recycled water for irrigation to reduce Salinas Valley groundwater pumping.



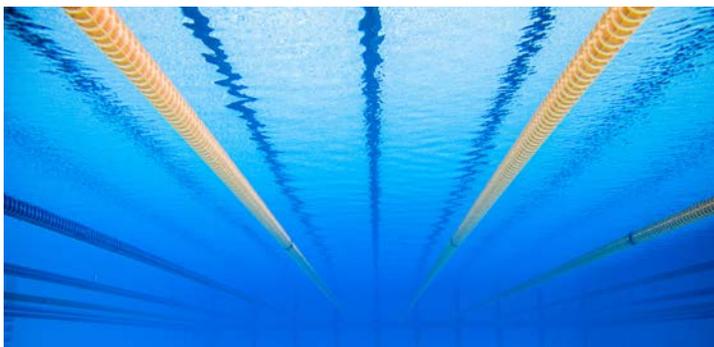
*The State requires that Blanco Drain waters be treated benefiting the environment and our regional watershed.*

Please visit [purewatermonterey.org](http://purewatermonterey.org) for detailed information about the Pure Water Monterey Program and the Blanco Drain Diversion Project.

## WHAT ARE LEGACY PESTICIDES?

**In Water:** Concerns have been raised about the presence of legacy pesticides throughout the water collection area, and that, via the Blanco Drain Diversion project, these constituents could end up in drinking water supplies.

Legacy pesticides are those that are no longer used, but are persistent in the environment. Many are insecticide compounds that were used in the 1940s, 50s and 60s, before being banned primarily in the 1970s. Of particular concern is the pesticide



*21 ng/L = 1 water drop in an Olympic sized swimming pool. This is the amount of DDE detected in samples of Blanco Drain raw water. After treatment, the final concentration is estimated to be less than 0.0042 ng/L, which is hundreds of thousands times less than the WHO guidance level of 1,000 ng/L.*

DDT (dichlorodiphenyltrichloroethane). Once thought to be the ultimate pesticide, DDT was banned by the State of California in 1970. It was also banned by the U.S. Environmental Protection Agency (EPA) in 1972 after questions were raised concerning potential effects on human health and the environment.

Despite its being out of use for more than 40 years, DDT and its related breakdown products (DDD and DDE) are found virtually everywhere on Earth. The special characteristics that made DDT an effective pesticide are the same characteristics that make it an ongoing environmental concern.

**In Sediment:** The higher concentrations of DDT, and its byproducts, found in the Salinas Valley sediment are essentially stuck there. This is because DDT is incredibly stable and is hydrophobic, meaning it does not easily dissolve in water. That explains why the levels in the soil may be high, while concentrations in the water are low to non-detectable. If the compound wasn't hydrophobic, it would have washed away in the 40 years since it was banned.

Any sediment that is introduced into the Blanco Drain flow will be removed through the advanced water treatment process, which involves passing through two sets of membranes (ultra-filtration and reverse osmosis) that have microscopic openings thousands of times smaller than the smallest sediment particle.

# TREATMENT PROCESS

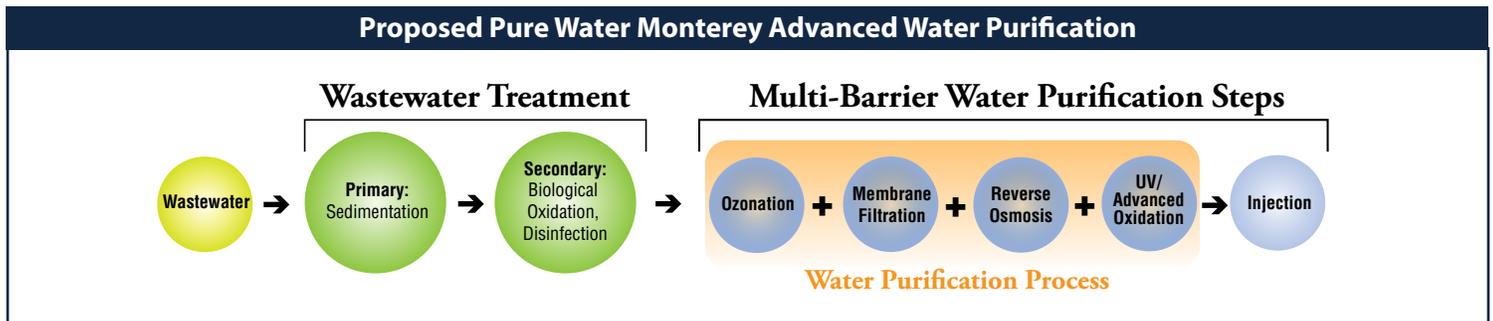
The 21 ng/L that was detected during the monitoring campaign (see below) was in one of four samples of raw Blanco Drain water before it entered the blending and treatment processes. Even during a drought year, Blanco Drain water would be blended with other waters with non-detectable or lower DDE concentration at a ratio of one part Blanco Drain to 17 parts water in the existing wastewater treatment collection system, thus further diluting the concentration of any legacy pesticides that may be present. During normal or wet weather years, the ratio of Blanco Drain water to other waters would be even lower.

After blending, the water would receive advanced treatment, going through six steps, each one providing further treatment reduction. Any pesticides stuck to sediment would be removed well before reverse osmosis. And reverse osmosis on its own has

been shown to remove greater than 99% of DDT from water. After treatment, the final concentration of DDT remaining in the water is estimated to be less than 0.0042 ng/L, which is hundreds of thousands times less than the WHO guidance level of 1,000 ng/L.

In fact, the treatment to be provided by the proposed project would effectively remove any chemical constituents present in the wastewater and new source waters to levels below detection and/or safe levels prior to groundwater injection.

Pilot test results show the purified recycled water that would be produced by the Regional Treatment Plant and full-scale Advanced Water Treatment Facility would meet CDDW and Regional Water Quality Control Board health and water quality regulations for groundwater replenishment.



## LEGACY PESTICIDES ARE NOT TO LEVELS OF CONCERN

### ONLY MINIMAL LEVELS DETECTED IN MONITORING CAMPAIGN

While DDT is a known legacy pollutant in Salinas Valley sediment (or soil), it was not detected in any of the source water samples collected during a 12-month monitoring campaign conducted in 2015 as part of the project's California Environmental Quality Act process.

The source water monitoring program consisted of the collection of quarterly samples that were analyzed for nearly 450 inorganic and organic constituents from the Regional Treatment Plant secondary effluent, agricultural wash water and Blanco Drain.

Neither the EPA nor the California Division of Drinking Water (CDDW) have drinking water regulations specifically for DDT. However, the World Health Organization (WHO) has set a drinking water guidance value of 1,000 nanograms per liter (ng/L)

DDE was detected in only one of four samples of Blanco Drain Water. (DDT and DDD were not detected in any of the samples.) That sample showed DDE was at a concentration of 21 ng/L, which is well below the WHO standard.

**To put this in perspective, 21 ng/L is like a single drop of water in an Olympic sized swimming pool.**

### RISK ASSESSMENT

Risk assessment is a process that examines the toxicity of a chemical and the potential exposure to that chemical in order to estimate the risk to human health. Using the United States EPA risk assessment methodology, scientists have reached the following conclusions regarding the concentrations of DDE that is expected to remain in the water after blending and treatment:

- The post-treatment concentration of DDE is 11,000 times **less than** the risk-based screening level developed by the U.S. EPA.
- It would take more than 7,800 days (over 21 years) of drinking 2 1/2 liters of water and taking one shower (or bath) lasting 40 minutes, per day, to reach the dose of DDE that California considers safe for a single day of exposure.
- By comparison, the risks from the post-treatment concentration of DDE are more than two million times **less than** the risks that would be acceptable for arsenic in drinking water and 21,000 times **less than** the risks of benzene in ambient air.

*Note: Though neither DDT nor DDD were detected in Blanco Drain samples, the risk analysis took the conservative approach of including those chemicals at the same detected concentration of DDE. The findings for those constituents were in line with the above.*

Source: Laura Kennedy, Vice-President, Kennedy/Jenks Consultants