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California Public Utilities Commission
Public Comment on CalAM's MPWSP
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Comments on intake reliability and risks

Introduction

There are many complex factors which make up a successful desal plant. But it is safe to say that without a consistent, dependable, RELIABLE water intake source, the rest doesn't really matter, because without that, you got nothing. This project calls for source intake in excess of 8 billion gallons a year for decades. If the location cannot provide it, the project is a failure; a very, very expensive failure.

CalAM's intake system for the MPWSP can most accurately be described as questionable. The slant well technology is unproven, and is operating nowhere in the world. The water is drawn from an aquifer that is in an overdraft basin and seawater intruded. The hydro-stratigraphy models for the DEIR were developed by GeoSciences and its president Dennis Williams, now revealed to have serious conflicts of interest, with a keen interest in making slant wells work at this location, come hell and low water. Yet he remains on the HydroGeologic Working Group (HWG) apparently changing hats from representing the CPUC to representing CalAM. I find that situation unconscionable, but there it is. Later today we may learn from the California Coastal Commission what Weiss Associates and CCC staff think of the HWG analysis. The following piece was penned by me last month in an effort to clear up a common misperception. Parties to this project conflate groundwater and usable water, and/or misperceive "unusable water" as valueless water. It is critical that regulators do not make that same mistake.

Source Water Intake within Aquifer Regions

Conventional wisdom says that the California government agencies responsible for water desalination applications have determined that subsurface intake systems are the preferred and superior method of intake, such that they need to be proven infeasible before other source water intake systems, such as open ocean, can be entertained.

What I envision the intent of the subsurface preference to be, is that the policy makers are imagining that the water would be taken at a depth below a sandy stretch of seabed and that the water coming in would be 100% seawater. The substrate (particles of sand and mud making the seabed) would act as an effective and natural filter, keeping living organisms and detritus from being sucked into the intake pipe. This would offer a layer of protection for both the biome, and for the pipes, keeping living things living and separate from gumming up the works of the intake.

However all subsurface intake systems are not equal; far from it.

For the Monterey District, CalAM has chosen the Cemex site in Marina for its subsurface intake system using novel slant wells which nudge out towards the ocean. It is open to debate about whether the terminus of the current test slant well actually extends beyond the mean high tide line as the defining border of the ocean, but in practical terms it makes no difference. The reason is that the slant well is pumping its source intake water from an aquifer, or a series of

“unconfined” aquifers, known as the shallow Sand Dunes, the 180 foot and possibly impacting the 400 foot aquifer. These aquifers extend well beyond the mean high tide line under the seabed. These aquifers are defined as unconfined because they do not have a complete layer of impermeable clay between them (know as aquitards), and so the water flows between (and can be sucked out from) the loosely defined layers of aquifers.

Because this water is so near the ocean it is brackish, a mixing of freshwater from further inland and the seawater pushing in from the ocean. When the initial testing was done here, the salinity represented a value that was roughly 2-3 parts ocean to 1 part fresh. This is a level of salinity far from potable, and also too salty for agricultural purposes. For some involved in the debate, they conceive that the water is essentially useless, and hold little concern for what happens to it. The fact that it has a fresh component means that it will require less energy to desalt, so that is of some benefit. But it also comes with a legal caveat. Fresh water in the over-drafted Salinas Valley basin is protected by the Agency Act and so this “useless” resource has been, and will continue to be, a source of litigation between CalAm and senior water rights holders in the Basin.

But from an environmental standpoint this brackish water is far from useless; it is essential. You can imagine these aquifers which bring freshwater down to the sea as a large slow moving underground river. Where-ever it encounters the seawater it will mix with it. This is also true above land, where the freshwater meets the sea we call it an estuary or a slough. The mixing between salty and fresh will always occur when these two types of water meet. Together they create the third type, the brackish water.

The brackish water is a buffer between the seawater and the freshwater. It is a transitional zone. There are many factors which determine how large an area make up this transitional buffer zone, which is beyond the scope of this document.

The slant well intake system for the proposed MPWSP desal plant will be taking this brackish buffer zone water at a rate of roughly 23 million gallons per day which is over 8.4 billion gallons per year. As you remove this buffer zone, the sea will tend to move in faster than the fresh (even more so during a drought). Therefore the buffer zone will be re-created further inland and so this is the definition of seawater intrusion.

Know one knows exactly how this will play out, but generally you can count on unanticipated negative consequences beyond the anticipated ones, what a former Secretary of Defense referred to as the unknown unknowns.

For these reasons, the test slant well should be terminated, and the intake system declared infeasible, and the legislation or policies broadened to prohibit any intake system that draws its water from California aquifers for a desal plant of a regional scope.