

GrokSurf's San Diego

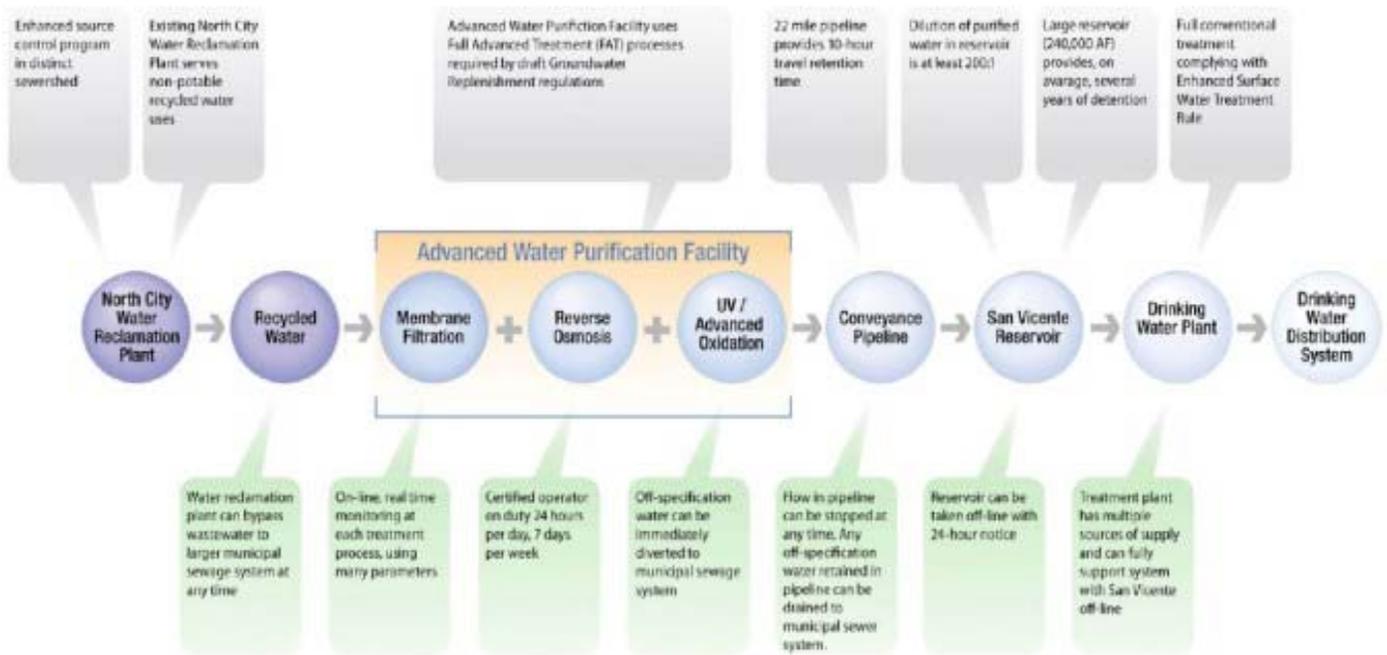
San Diego faces a major decision on wastewater treatment and water recycling

Posted by [George J Janczyn](#) on April 24, 2013

For more than a year San Diegans have been recipients of news media reports and a public outreach program explaining the city's one-year Water Purification Demonstration Project (WPDP). Yesterday (Tuesday April 24), the City Council got the final report and discussed possible next steps. Local news media have yet to weigh in on this story, so here's a start:

The goal of the WPDP was to determine the feasibility of taking recycled water and purifying it in a special advanced treatment facility located at the North City Water Reclamation Plant, sending the purified water through a pipeline to the San Vicente Reservoir where it would blend with imported water from the Colorado River and Northern California, and then be piped to the city's Alvarado Water Treatment Plant for final purification and distribution to residents (in emergencies the water could go to other treatment plants but Alvarado would be the default). The process is sometimes referred to as Indirect Potable Reuse through Reservoir Augmentation, or IPR.

Figure F - 1: Components of a Multiple Barrier Reservoir Augmentation Project at San Vicente Reservoir



Recycled water is produced by treating wastewater to a “tertiary” level after which it is used for irrigation and commercial/industrial applications. The IPR process takes some of the recycled “tertiary” water and puts it through an advanced purification process that renders it similar in quality to distilled water.

The report “provides an overview of the technical studies, advanced water purification facility testing, and public education and outreach efforts conducted as part of the Water Purification Demonstration Project. It also presents findings that support the conclusion that a reservoir augmentation project at San Vicente Reservoir would be feasible.”

In short, IPR was shown to be technically sound and, if a recommended large-scale project is approved, would provide the city with about 15,000 acre-feet per year of safe, sustainable, reliable, locally sourced potable water.

A large-scale IPR program would also significantly reduce the amount of wastewater discharged into the ocean. And if a full-scale program works out well, the program could eventually be expanded to build additional satellite advanced purification facilities and recycle 90,000 acre-feet or more per year. That’s 90,000 acre feet less water lost to wastewater discharge.

The City Council enthusiastically accepted the report. Now it needs to decide whether to authorize a full-scale IPR program. That decision will have to wait until Public Utilities Department staff report back in 90 days to the Natural Resources & Culture Committee with a recommended preferred plan. The committee would then forward a recommendation to the full City Council.

The really big part of this story, though, is that San Diego's wastewater management policy has been a problem for many years and it's in that context that the potable reuse program needs to be understood.

The Point Loma Wastewater Treatment Plant



Point Loma outfall pipeline where it enters the Pacific.

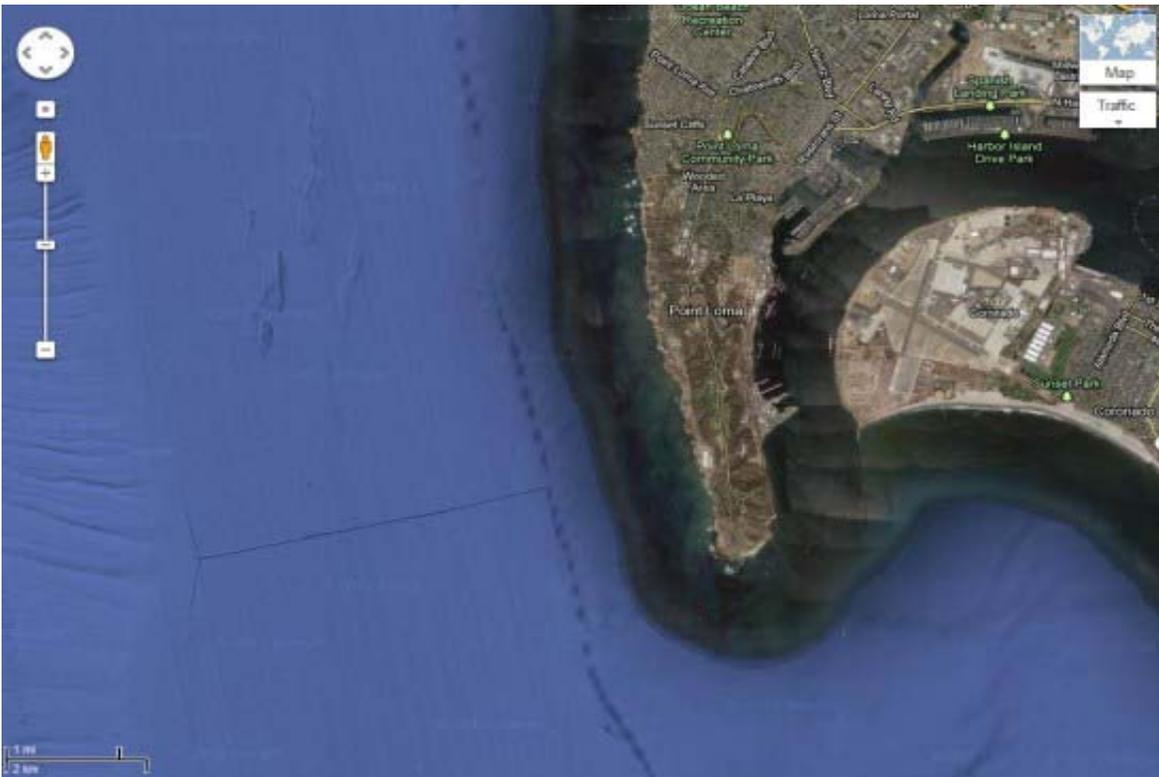
Because of its arid climate and limited local resources, San Diego needs to import some 80% of its water from hundreds of miles upstream, mainly the Colorado River and northern California. Before San Diego gets its water, upstream municipalities consume some of that water, much of which

turns into wastewater. They treat their wastewater and discharge it into the flow of water that continues to downstream communities, where the process is repeated. And repeated.

By the time imported water gets to San Diego, the imported water contains the discharge from some 300 upstream wastewater treatment plants. That should be thought-provoking enough, since San Diego's water only gets treated in a standard water treatment plant, not an advanced purification facility as is being proposed.

Since there are no users downstream of San Diego, the city discharges its wastewater into the Pacific Ocean from the Point Loma Wastewater Treatment Plant, to the tune of roughly 175 million gallons each day. There's a problem with that, and not just because so much water gets wasted by dumping it.

The federal Clean Water Act requires wastewater discharges to receive "secondary treatment," and that's what the upstream communities do. San Diego, however, does not. Instead it does what it calls "advanced primary" treatment.



The underwater 4.5 mile outfall pipeline and the “Y” diffuser can be seen on this Google Maps image

Back in 1988, the EPA sued the city for failure to achieve secondary treatment. The city, however, felt that an upgrade to secondary would be unnecessarily and exceedingly expensive (likely more than \$1.5 billion that ratepayers would have to fund) and that the parcel of land on which the Point Loma plant lies is so small that it was impossible to expand it.

Ultimately, the EPA agreed to give San Diego some leeway, but as mitigation the city had to develop a water recycling/reclamation program with a capacity of 45 million gallons per day (mgd) and monitor the “advanced primary” Point Loma effluent plume dispersed into the Pacific to ensure discharge quality would fall within specified limits.

The reduction in wastewater discharged from Point Loma along with ocean monitoring would be good for the environment, while recycling would provide more usable water for the city.

Thus was born the 30 mgd capacity North City Water Reclamation Plant (1997) and the 15 mgd capacity South Bay Water Reclamation Plant (2002), along with a “purple pipe” network to distribute recycled water treated at the “tertiary” level to large customers for irrigation and certain commercial/industrial uses.

But things didn’t work out as well as expected.

As reported by a [Water Online news report](#):

In 1997, the San Diego Water Department raided its cash reserves of \$65 million intended for fixing the city's crumbling drinking water system. It used that money to lay 46 miles of purple pipeline to customers in Mira Mesa, Torrey Pines, Scripps Ranch and University City.

Recycled water has turned out to be a big bust. It cannot be sent through existing water lines, it requires expensive construction of new pipelines ("purple pipe") to distribute the water to customers. Then the customers have to retrofit their existing plumbing or irrigation system with parallel purple pipe systems. The city spent over \$18 million to assist customers with that expense. A retrofit of Miramar Nurseries, for instance, cost the city \$300,000, according to Hossein Juybari, the city's recycled water coordinator. The golf course at Miramar Marine Corps Air Station is being replumbed at a cost of \$700,000 to the city. The EPA figured the city could reuse 25 percent of the flows of the North City plant by the end of 2003, a goal it set when it granted the city \$70 million toward construction. Currently, the city is reusing less than 17 percent of the sewage processed at North City, and water officials say they have no hope of reaching 25 percent anytime soon. By 2010, the EPA goal for the city becomes 50 percent.

[The City has not responded to my request for comment on the veracity of this report]

Another setback to recycling occurred with this 1999 City Resolution ordering the City Manager not to spend money on "water repurification."

Meanwhile, the City received another EPA waiver for Point Loma in 2001 and lawsuits were filed by San Diego Coastkeeper, the San Diego chapter of the Surfrider Foundation, and the San Diego chapter of the Sierra Club. That history is documented in a memo written by Marco Gonzalez from the Coast Law Group.

According to Gonzalez, there were 3 points to address:

- Issuance of the waiver in the proposed form violated federal CWA [Clean Water Act] anti-degradation and anti-backsliding regulations.
- Failure by the City to achieve 45 million gallons per day (MGD) of sewage reclamation was a violation of OPRA [Ocean Pollution Reduction Act], and that merely constructing reclamation capacity without implementing beneficial reuse was insufficient.
- The plume outfall [from Point Loma] monitoring program was not sufficient to accurately characterize plume migration and impacts.

(Gonzalez's memo goes into considerable detail about the negotiations and events during that period. It is a fascinating read, [posted here with his permission.](#))

The outcome of these negotiations brought about the following:

- 1. Acknowledging that the Point Loma wastewater plant lacked sufficient space for expansion, the groups proposed, and the city agreed, to conduct a pilot study of one of the more promising technologies – called Biologically Aerated Filtration (BAF) – to see if it could achieve secondary standards given the quality of Point Loma’s sewage influent and flow demands.*
- 2. A monitoring program by an independent team of technical experts from the Scripps Institution of Oceanography would be assembled to determine the effectiveness of Point Loma’s “advanced primary” treatment.*
- 3. The City would further consider advanced treatment of its reclaimed water for comingling with imported water supplies in drinking water reservoirs [i.e., indirect potable reuse].*

Point #3 above resulted in the 2005 Water Reuse Study intended to look at how we might maximize the use of reclamation capacity then existing at North City and South Bay. Following this study, the decision was made to pursue the IPR Demonstration Project. During this same period, a coalition of environmental, business, labor, and trade groups formed the “IPR Coalition” to advance the cause.

Years passed as these issues were hashed out. A stronger ocean monitoring program was developed, but the capacity of the two reclamation plants remains underutilized.

At the end of 2008, the City Council overrode a mayoral veto and authorized the raising of funds to pay for the IPR demonstration project (which later got the name Water Purification Demonstration Project).

In 2009, the city needed to apply for a new 5-year EPA waiver, the environmental groups opposed it and promised lawsuits, but Marco Gonzalez and Bruce Reznik offered the City a “non-opposition” to the waiver (very different from “support”) in exchange for the much more in-depth water reuse study considering the possibility of maximizing reclamation and minimizing discharge to the ocean.

With this agreement in place, the city was able to get another waiver. But the EPA and California Coastal Commission warned the city that future waiver requests would not be looked upon favorably.

However, as Mr. Gonzalez wrote in his memo, “the light bulb went off:”

*“The goal of the Clean Water Act is not simply to ensure compliance with water quality standards and to achieve the cleanest runoff mandated by federal or state laws. **Rather, the structure and purpose of the CWA is geared toward minimizing and when possible eliminating discharges altogether** [emphasis added]. Given the value of water in San Diego (at the end of the Colorado River and State Water Project pipelines), the likelihood of continued drought, the technological gains in reverse osmosis, the relatively dirty source water entering our reservoirs, the political and public acceptance for desalination, and a host of other political, economic, and social factors, there is no way San Diego can sustain its current paradigm of pushing sewage down to Point Loma and off into the Pacific Ocean.... Looking at the current paradigm of water supply and sewage conveyance/treatment, the **ONLY** sustainable option is IPR. With this perspective, our goal became clear. We want to eliminate all discharges to the ocean and maximize IPR as soon as economically, technically, and politically feasible.”*

The IPR Coalition, now named the Water Reliability Coalition, continues its work to this day (for some reason the website is currently inaccessible but they've been notified).

Next steps

The clock is ticking for the Point Loma plant. Under the current waiver, the city is already on notice that future waiver requests will not be looked on favorably. Last October, the California Coastal Commission sent a letter to the City expressing “significant concern that the City has not yet committed to milestones and implementation schedules that would enable the City to end the pursuit of future secondary treatment waivers.”

If the city doesn't demonstrate substantial progress, a new Point Loma waiver might not be easily won and the city could face fines, penalties, and lawsuits as a consequence. The waiver expires July 31, 2015; a renewal application will have to be made in 2014. I've learned the Public Utilities Department Director Roger Bailey is now leading a Point Loma waiver strategy team but haven't been able to obtain more information about it.

The City Council's acceptance of the IPR project report is certainly progress. But in accepting the report, several City Council members indicated a desire to also explore Direct Potable Reuse, or DPR as a less expensive alternative to IPR. Whereas the IPR proposal involves construction of an expensive pipeline to the San Vicente Reservoir (which, incidentally, has been vastly expanded), DPR would send the water directly to the potable water treatment plant (likely Alvarado), using a much shorter pipeline, with no detention time in a reservoir. That could save more than \$200 million in pipeline construction, but also raises questions about safety and regulatory approval.

So much time, effort, and expense has gone into clearing regulatory hurdles for the IPR project, that DPR, for all its attractiveness, could be a distraction from work that is still needed for IPR. The California Department of Public Health (CDPH) and the San Diego Water Board have indicated general acceptance of San Diego's IPR project, but it is many years away from regulatory approval for DPR. Senate Bill 918 requires CDPH to investigate the feasibility of developing uniform water

recycling criteria for direct potable reuse and to provide a final report on that investigation to the legislature by December 31, 2016. The regulations will come some years after that.

One option could be to proceed with a large scale IPR program with a pipeline to San



San Vicente reservoir before the dam raise project



The heightened San Vicente Dam increases the reservoir capacity from 90,000 acre-feet to 242,000 acre-feet.

Vicente as already envisioned. Subsequently, satellite advanced treatment plants could be built for DPR. That would allow San Diego's waiver application to say we're making substantial progress. It would also allow time for CDPH to issue regulations for DPR...it seems likely that won't happen for many years beyond 2016.

Assuming the preferred path is IPR now and DPR in the future, the issue is still how to get things moving? What questions need to be addressed?

At the City Council meeting, PUD's Marsi Steirer said the cost of IPR would not only be lower than the cost of desalination, it would be cheaper than imported water (around \$1,000 per acre foot). That's competitive with the price of imported water, but according to the Project report the actual cost is about \$2,000 per acre foot—around where desalination is priced. Reading from the report:

"If full-scale reservoir augmentation is implemented, the city would not need to build a 7 million gallon wet weather storage facility to attenuate wastewater flow to Point Loma; reduced overall flow to Point Loma would reduce annual operations and maintenance costs at Point Loma plant and Pump Station 2 which conveys flows to Point Loma. Water salinity in the city water supply would be lower, potentially reducing costs further. Taking these factors into account PUD estimates the NET cost for IPR would be about \$1,000 per acre foot."

But wastewater has to be treated at Point Loma or at the North City reclamation plant, so are the savings really that great or is the cost just being shifted from Point Loma processing to North City processing? It will be interesting to see if the sewage treatment portion of our water bill shows a price decrease. So, next steps would appear to be:

- IPR would benefit both water and wastewater systems, therefore proportional share of costs needs to be determined in order to prepare water and wastewater rate cases
- Determine a contracting mode
- Refine pipeline alignment, which represents an estimated 60% of total implementation cost
- Coordinate with regional wastewater and reuse objectives including Point Loma waiver expiration in 2015
- Monitor development of DPR regulations

In any event, it doesn't seem wise to argue that we should embark on IPR because it is cheaper. It may or may not be less expensive than desalination or imported water in the long run, but IPR is clearly the right thing to do.

I welcome any comments that can correct and improve on this report.

I consulted many sources for this story, here are a few that may be of interest:

- [U-T San Diego lobbies against secondary treatment, asks for new waiver in 2007](#)
- [Point Loma Secondary Treatment Discussion Brief Powerpoint slides for City Council](#)
- [Planning for conversion to secondary treatment on a space constrained site Powerpoint slides \(i.e., Point Loma\)](#)
- [California Coastal Commission Staff Status Report Regarding City of San Diego, Secondary Treatment Waiver](#)

- [Sewage Plan Envisions Massive Expansion of Wastewater Recycling / Rob Davis, Voice of San Diego](#)
- [Most recent EPA Point Loma waiver](#)
- [San Diego Coastal Corrections Act of 1995](#)
- [2012 Recycled water study](#)
- [2010 Recycled water master plan update](#)
- [2003 SDCWA Urban Water Facilities Master Plan](#)
- [City looks at turning wastewater into drinking water](#)
- [Advances in water recycling approved by San Diego City Council NR&C Committee](#)
- [San Diego ocean monitoring program to be renewed](#)

Many questions that I submitted to the City and other parties were not answered in time for this post. I may post a followup after they reply.

This entry was posted on April 24, 2013 at 4:37 pm and is filed under [Water](#). Tagged: [Purified recycled water \(indirect potable reuse\)](#), [Recycled water](#), [Water Purification Demonstration Project](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. You can [leave a response](#), or [trackback](#) from your own site.

8 Responses to “San Diego faces a major decision on wastewater treatment and water recycling”

1. *miltburgess* said

[April 24, 2013 at 5:50 pm](#)

Thanks for doing a very thorough effort researching the issue of IPR and the San Diego Water Policy Implementation Report. Now all we have to do is to raise the consciousness level of the average San Diego citizen to understand how important it is we get this underway as soon as we can. Maybe we can talk the Feds into kicking loose that half a billion dollars for water infrastructure the State has ignored (San Diego UT article page 29 of the A section last Sunday). It's follow the money time. Here we are sucking on a several hundred mile long pipe subject to