

**Summary of
PRELIMINARY PROJECT SPECIFICATIONS
for
WATER PROJECT 2**

**Seaside Basin Aquifer Storage and Recovery Facility at
Seaside Middle School, Seaside**

November 2011

PURPOSE

This document provides a brief narrative description of existing and future general specifications for the Water Project 2 Aquifer Storage and Recovery (ASR) facility proposed for the Seaside Middle School site. This document is intended to support ongoing planning for permanent facility installations at the site. The description and schedule are based on current plans, which are subject to change as additional information becomes available regarding various external factors including funding availability, timing of improvements to the California American Water (Cal-Am) distribution system, and necessary land use and regulatory approvals.

ASR PROJECT BACKGROUND

The Monterey Peninsula Water Management District (MPWMD) and Cal-Am are cooperating on the investigation and development of the Seaside Basin ASR Project. The ASR project concept entails diverting groundwater from the Carmel River Alluvial Aquifer when there are excess winter flows in the Carmel River and conveying the water approximately six miles to the Seaside Basin via the existing Cal-Am delivery system. This water is then injected into specially-constructed ASR wells for subsequent recovery and delivery to Cal-Am customers during dry summer periods. The ASR concept was successfully tested in the Seaside Basin between 1998 and 2007, and permanent operations began in 2008 at the nearby Water Project 1 ASR facility.

ASR PROJECT SITE LOCATIONS

The **first phase** of the ASR project (Water Project 1) is located southeast of the intersection of General Jim Moore Boulevard and Eucalyptus Road on former Fort Ord property in Seaside, called the “Santa Margarita ASR site”, for the geologic formation where the injected water is stored. At this site, up to 3,000 gallons per minute (gpm) of water can be injected underground via two existing onsite ASR wells, with an estimated

average annual storage volume of 920 acre-feet per year (AFY). This site is shown on the map in **Figure 1**. Project-level environmental review evaluation of this first phase of the ASR project was prepared for MPMWD in 2006¹.

The proposed **second phase** expansion (Water Project 2) located at the Seaside Middle School site would have two ASR wells, similar to the existing site. At the School site, it is anticipated that up to 3,500 gpm could be injected for an estimated average annual storage volume of approximately 1,000 AFY. The wells are sited along the strip of property to the east of the school buildings, and west of General Jim Moore Boulevard. This site is also shown in **Figure 1**. The Seaside Middle School site was chosen as the expansion area as it has the prerequisite combination of hydrogeologic, hydraulic, and land-use compatibility features to enable successful ASR operations. The site is a currently unutilized area of the school property that is close to water transmission mains, which would facilitate water delivery and recovery. This site is also located in an area that is not expected to interfere with school operations or potential future expansion plans on the school parcel. This site was included as a “non-contiguous” alternative ASR well location as part of the Phase 1 ASR project environmental review².

WATER PROJECT 2 (SEASIDE MIDDLE SCHOOL) ASR SITE FACILITIES

Existing Facilities

In August 2008, MPMWD began negotiations with the Monterey Peninsula Unified School District (MPUSD) for potential use of the site as future ASR facility. This led to the October 2009 exploratory drilling and monitor well construction program, which confirmed the geology at this location as suitable for construction of the new ASR wells. Also in October 2009, the State Water Resources Control Board (SWRCB) adopted its Order 2009-0060 (i.e., Cease and Desist Order [CDO]), which requires reductions in Cal-Am production from their Carmel River system sources according to a schedule that will reduce Cal-Am Carmel River production to the legally-mandated limit of 3,376 acre-feet per year (AFY) by January 1, 2017. One of the conditions of the CDO (Condition 5) requires that “Cal-Am shall implement one or more small projects that, when taken together, total not less than 500 afa to reduce unlawful diversions from the river” within 24 months of the CDO. Cal-Am requested that a new ASR well at the Seaside Middle School site be allowed to meet this small project requirement. Accordingly, once authorized by SWRCB and MPUSD, Cal-Am and MPWMD began a cooperative effort to drill and construct an ASR test well at the site, which if successful, could be utilized to meet this CDO requirement. This work began in Summer 2010 and has resulted in the following existing onsite ASR facilities:

¹ Jones & Stokes, August 2006. *Final Environmental Impact Report/Environmental Impact Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project.*

² See Page 2-9 of Jones & Stokes, August 2006.

ASR Monitor Wells Two monitor wells, a “shallow” and “deep” monitor well, are installed at the site. The 2-inch diameter shallow well is 640 feet deep and completed in the Paso Robles Formation aquifer; the 4-inch diameter deep well is 960 feet deep and completed in the Santa Margarita Sandstone aquifer.

ASR Test Well This well is 960 feet deep and 22-inches in diameter, and is constructed of stainless steel blank and wire-wrapped screen casing. A schematic of the well completion is provided in **Figure 2**. The well is a test ASR well as injection and recovery operations have not yet been conducted at this location within the target Santa Margarita Sandstone aquifer. Given the variability of hydrogeologic conditions within this aquifer across the Seaside Basin and MPWMD’s ASR experience, ASR well performance needs to be demonstrated at this new location. It is anticipated that this testing will be conducted during the upcoming Water Year 2012 injection season. The well has been constructed, however, such that it will be able to serve as a full-scale ASR well (i.e., ASR-3 well) for the permanent project at this site. The well has permanent appurtenant fixtures including above-ground piping, valving and metering, to facilitate injection, backflushing and extraction operations. The well and appurtenant fixtures is currently enclosed by temporary construction fencing as shown in **Figure 3**.

Electrical Equipment Currently, a permanent PG&E electrical transformer and temporary well motor switchboard control panel exist at the site, as shown in **Figure 4**.

Proposed Facilities

The proposed site would consist of two ASR wells, plus a backflush percolation basin, appurtenant pipelines and valves, and a small building to house the well control equipment. Site entry and exit would be from General Jim Moore Boulevard. The finished site will be protected by permanent security gates and perimeter fence. The preliminary general site plan showing the locations of permanent above- and below-ground facilities is shown in **Figure 5**. The remaining main permanent facility features planned for installation are briefly described as follows:

ASR -4 Well This well will be located at the northern end of the site, and is anticipated to be of similar construction as the existing ASR well at the site. Based on our understanding of the regional geology, it is likely that the target Santa Margarita aquifer will be encountered at a slightly deeper depth and with slightly greater thickness at this location.

Backflush Pit A percolation pit will be constructed to receive discharges during routine backflushing operations of both ASR wells. The approximately 30’ x 120’ x 10’ deep basin will be designed to hold 270,000 gallons, which will accommodate 77 minutes of backflushing at 3,500 gallons per minute flow rate. Due to the location of the backflush pit above the slope on the east side of the school buildings, the pit will need to be engineered with appropriate features to prevent any slope failure due to temporary saturation of the pit sidewalls during backflushing operations. In addition, it is anticipated that a low (approximately 4’ high or less) diversion wall will be constructed at

the base of the slope to divert any runoff that could escape the site in the event of a pipeline rupture.

Electric Building An approximately 600 square feet (20' x 30') unoccupied building will be constructed to house the electrical control equipment for both ASR wells. The precise dimensions will not be known until the equipment is specified and ordered; however, the building will be the minimum size needed to house this equipment. The building will be considerably smaller than its equivalent at the Water Project 1 site due to the fact that the Water Project 1 building (aka Santa Margarita facility building) will house a water disinfection system in addition to electrical control equipment; there will be no water treatment equipment at the Seaside Middle School ASR site. A typical design is shown in **Figure 6**. The design of the building will likely be a Spanish mission style, similar to the Water Project 1 facility building (**Figure 7**).

SITE PRELIMINARY SCHEDULE AND WORK PLAN

An updated preliminary construction schedule detailing the various construction activities necessary for full development of the Water Project 2 Seaside Middle School ASR site is shown in the chart in **Figure 8**. In this chart, the periods when the middle school is out of session for summer break are shown in gray shading. Construction activities that have the potential for noise generation that could be disruptive to school operations have been scheduled to coincide with the summer break periods to avoid any noise-related disruptions from these activities. This schedule is subject to change due to the ongoing planning, funding and regulatory approval constraints attendant to the project.

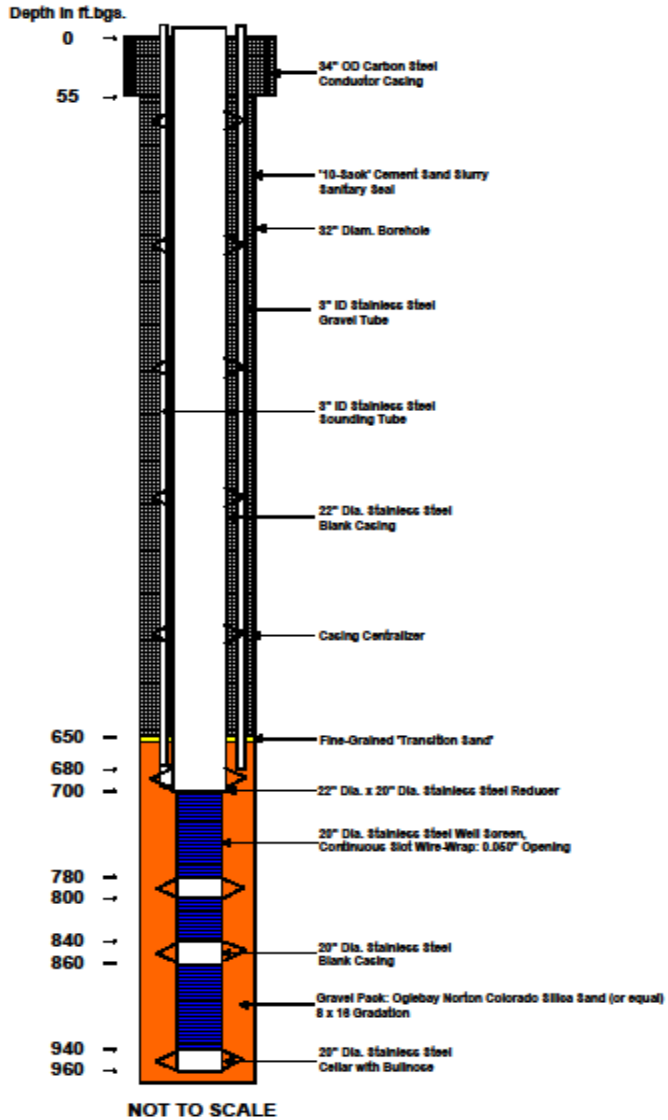
POST-CONSTRUCTION OPERATIONS

Once the two ASR wells are completed with their appurtenant pipelines, valves and controls, sound-proof enclosures will be installed over the wells' electric motors. A sound-proof enclosure similar to the anticipated specification for the Seaside Middle School ASR site is shown in **Figure 9**. These sound-proof enclosures have a proven track record for mitigating well motor noise effects, and have been successfully employed at other sites within Cal-Am's Monterey District water supply system. When the ASR site facilities become fully operational, periodic visits to the site will be made by a well operator. During the winter injection season, this would occur approximately once per day when injection operations are underway. During the summer extraction season, the site would also be visited about once per day or less frequently to monitor equipment, or conduct maintenance and repairs, as needed.



Figure 1. Vicinity map showing Santa Margarita and Seaside Middle School Aquifer Storage and Recovery sites.

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FINAL WELL DESIGN
Seaside Middle School Test Well
Monterey Peninsula Water Management District

Figure 2. Seaside Middle School ASR Test Well, Constructed in Summer 2010.



Figure 3. ASR Test Well, Seaside Middle School, November 2011.



Figure 4. Electrical transformer and motor control, Seaside Middle School, November 2011.

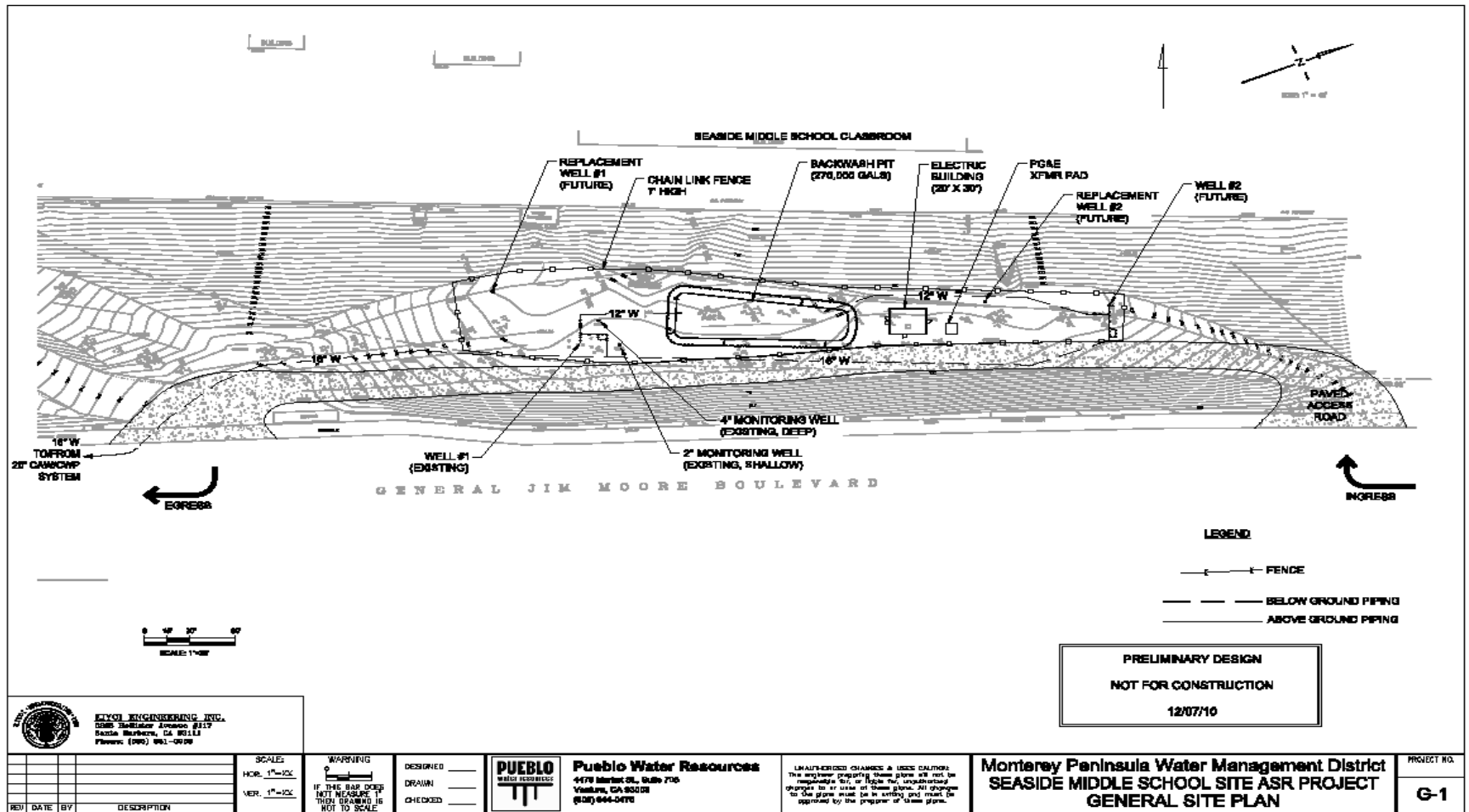


Figure 5. Preliminary general site plan for Seaside Middle School Aquifer Storage and Recovery facility.



Figure 6. Typical well control building for ASR facility.



Figure 7. Design of Santa Margarita ASR site facility building approved by Seaside Board of Architectural Review.

**PHASE 2 AQUIFER STORAGE AND RECOVERY
SEASIDE MIDDLE SCHOOL - WATER PROJECT 2 SITE
PROPOSED SCHEDULE FOR SITE DEVELOPMENT**

Task No.	Description	2010		2011				2012				2013			
		3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
done	Complete ASR-3 well construction	█													
done	Complete ASR-3 production testing		█												
done	Develop ASR-3 piping & electrical plans			█	█										
done	Design / bid ASR-3 pump, motor, FCV				█	█									
done	Design / bid ASR-3 well piping, temp elect					█	█								
done	Install ASR-3 well piping, temp elect						█	█							
done	Install ASR-3 pump, motor, FCV							█	█						
1	Prepare permanent project specifications									█					
2	Develop detailed project description										█				
3	Prepare, adopt CEQA document											█			
4a	Conduct BF pit geotech investigation												█		
5	Prepare ASR-4 design, bid/award contract													█	
6a	Develop full site civil, electrical plans														█
4b	Prepare BF pit plans, bid specifications, permits														█
7a	Secure permits, drill/construct ASR-4 well														█
6b	Prepare elect building plans														█
7b	Install temporary production discharge piping														█
8	Construct BF pit, diversion wall below site														█
9	Secure building permits for elect building														█
7c	Complete ASR-4 production testing														█
10a	Design, bid ASR-4 pump, motor, FCV														█
10b	Install ASR-4 pump, motor, FCV														█
10c	Install ASR-4 well piping, temp elect														█
11a	Bid/award contract for elect control equip														█
11b	Bid/award contract for elect building														█
11c	Secure elect permit for building														█
12	Construct / equip elect building														█
13	Complete site paving, fencing, landscaping														█

- NOTES:
- Tasks shown above are proposed and will be refined as necessary.
 - 1st Quarter = Jan/Feb/Mar; 2nd Quarter = Apr/May/June; 3rd Quarter = Jul/Aug/Sep; 4th Quarter = Oct/Nov/Dec.
 - Construction activities with greater potential for noise generation are shown in **bold type**.
 - The potential noise-generating activities are timed to coincide with periods when Seaside Middle School (SMS) is not in session. These periods are the months of Jun, Jul, and early Aug, and are shown as gray shading.
 - Schedule is updated as of **November 14, 2011**.
 - The schedule shown above assumes that project access, easement and funding considerations do not constrain project timeline.

Figure 8. Water Project 2 Preliminary Development Schedule, Seaside Middle School ASR site.



Figure 9. Typical sound-proof well enclosure.