



## Hahamongna: “Flowing Water, Fruitful Valley”

Restoring Natural Flows to the Arroyo Seco  
An alternative plan for the Arroyo Seco Canyon Project

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# The Arroyo Seco Canyon Project

## An alternative: Restore natural flows to Hahamongna

This presentation is a follow on to written public comment made under the Initial Study submitted to Pasadena Water & Power in December 2019.

The presentation draws on science around water management in the Hahamongna basin paid for by PWP and the City of Pasadena.

The alternative, backed by the scientific studies, is to work with the natural processes in Hahamongna and restore natural flows to the upper Arroyo Seco. This approach will improve the quality and quantity of water captured for local use; it will also achieve the project objectives in an environmentally superior way.

Studies paid for by PWP and the City of Pasadena suggest that restoring natural flows to the upper Arroyo stream will:

1. Increase the amount of water that percolates into the aquifer for local use.
2. Improve the natural environment by working with rather than against the natural processes.
3. Fulfill the objectives of the Pasadena General Plan to “preserve, restore and maintain the natural character of the Arroyo Seco as a self-sustaining healthy ecosystem of plants and animals”.
4. Fulfill the intent of restoring the area to its original name “Hahamongna”: Flowing Water Fruitful Valley.

# Arroyo Seco Canyon Project

## Overview of the proposal by Pasadena Water & Power (PWP)

### Project Goals:

Maximize the City of Pasadena's "surface water rights".

To achieve this the project plans to:

- Increase diversion of the Arroyo stream from 18 cubic feet per second to 25 cubic feet per second.
- Expand spreading basins in Hahamongna into the area of the old JPL parking lot.
- Capture an additional 1,100 acre feet of "surface water" into spreading basins through increased diversion.
- Divert "all low flows" from the stream into spreading basins.

Increased diversion of "surface water" allows PWP to claim additional pumping credit from the Raymond Basin Management Board (RBMB) under the Raymond Basin Judgement established in 1944.

The project claims increased diversion will improve re-charge of the aquifer.

## **Concerns about the planned objectives**

Concerns about the increase of stream diversion center on a potential negative impact on the aquifer and the natural environment. The concerns are based on two studies:

### **1. “Hydrogeologic Investigation Devil’s Gate Water Collection Tunnel” Converse Consultants West (1995).**

#### **Key findings:**

1. Water percolation rates in the Arroyo Seco spreading basins are “by orders of magnitude” worse than the surrounding alluviums. This is due to “...siltation... combined with artificial compaction of surficial soils due to equipment, etc.”.
2. The alluvial stream zone can absorb up to 3,467 gallons per day per square foot (gpd sqft) – the equivalent of 2.5 gallons per minute per square foot.
3. The spreading basins absorb less than 40 gpd sqft – the equivalent of 1.4 gallons per hour per square foot.

The Converse findings suggest diverting more water from the natural stream could deplete the aquifer.

### **2. “Flood Hazard, Sediment Management, and Water Feature Analyses” - Phillip Williams & Associates (2000).**

#### **Key findings:**

1. Spreading basins: “may not be the most efficient or cost-effective way to recharge groundwater in the Hahamongna Watershed Park area”.
2. “...increased groundwater recharge might be achieved if natural flows are restored to the Arroyo Seco”.

## The Key Question:

In the Arroyo Seco Canyon Project Initial Study (IS) question number 3.10 (b) reads:

“Would the project substantially decrease ground water supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?”

In answer, PWP selected: “Less than significant impact” with the claim there will be an additional 1100 acre feet of aquifer re-charge annually.

However, the Converse Consultants study commissioned by PWP in 1995 suggests increased diversion from the stream to spreading basins could have an opposite and negative impact:

The project will divert an additional 1100 acre feet of water from the stream that absorbs water at over 3,000 gallons per day per sqft; the water will end up in spreading basins that absorb water at less than 40 gallons per day per sqft. Per the science paid for by PWP, the spreading basins are 99% less efficient at absorbing water than the stream.

In 2014 PWP were asked to prove the claim about improved aquifer re-charge. The response: PWP has to use the spreading basins “regardless of their efficiency” and “efficiency is not about how quickly water percolates into the aquifer.” The new Draft EIR, again, fails to answer the question.

**The selection on the Initial Study needs to change.**

**Impacts from potential depletion of the aquifer as a result of this project must be considered.**

## “The Law”:

PWP refer to the Raymond Basin Judgement (“The Law”) as the reason why there is no alternative to “maximize surface water rights” other than increasing stream diversion. RBMB adjudicates pumping credits to the different parties based on the Judgement.

Section II (1) of the Raymond Basin Judgement (1944) reads:

*“The water shall be spread for percolation into the underground in the existing water conservation facilities of the Los Angeles County Flood Control District (now run by PWP), or in such additional spreading grounds as the parties may **acquire or construct**, or in **any natural stream channels** leading to such existing or future spreading grounds...”* (Parentheses & bold added).

Today, RBMB issues pumping credit to the Lincoln Avenue Water Company based on streamflow from two USGS gauging stations – one being the El Prieto gauging station. Under the law, Lincoln Avenue Water Company receives pumping credit based on water “spread” in a “natural stream channel”. The stream channels do not lead to any spreading basin. This current practice should be expanded “under the law” to include the Arroyo Seco for water “spread” in the “natural stream channel” up to an agreed point of absorption prior to flows reaching the dam.

In 1967 USDA defined spreading as a way to slow flows as they pass through the “intake area”. (USDA Soil Conservation Service Engineering Division Technical Release #36 Geology June 1967, Victor Ponce). Diversion into “impound basins” like the Arroyo Seco Spreading basins is just one way to “spread” water. The Raymond Basin Judgment does not limit the term “spreading ground” to only mean “impound basins”. The ASCP provides an opportunity to “spread” water through other means than “impound basins”.

## The case for alternatives

May 12, 2015 LA County Board of Supervisors adopts the resolution for Proposition 84 implementation. The purpose is the:

“...the implementation of projects that protect communities from drought, conserve and improve water quality, restore habitat, and reduce dependency on imported water.”

Section XII of the Raymond Basin Management Board (RBMB) Charter states the RBMB Powers and Responsibilities:

“... shall be exercised with a view toward protecting the long term quantity and quality of the groundwater supply; utilizing the groundwater storage capacity of the basin for the maximum advantage of the parties... to reduce costs, improve reliability of supply, and to protect against drought”.

The Philip Williams Study in 2000 states:

“RBMB is currently in the process of re-evaluating their accounting procedure for percolation in the basin” and desires “to make this accounting procedure more scientifically rigorous.”

June 2013, Mr. Tim Brick, Managing Director of the Arroyo Seco Foundation (ASF) wrote to Mr. Tony Zampielo, Executive Officer, of RBMB stating that the Arroyo Seco Canyon Project:

“... maybe a good opportunity to explore the best way... to percolate water into the aquifer...the goal of the Arroyo Seco Canyon Project should be to maximize both water percolation and habitat values...”

**Note:** ASF submitted the grant application for the ASCP on behalf of PWP. The ASCP must fulfill the objectives of the Prop 84 requirements.

## The legal requirement to consider alternatives:

*State CEQA Guidelines* Section 15126.6:

California Environmental Quality Act (CEQA) Guidelines require an EIR to describe a range of reasonable alternatives to the project, or to the location of the project, “which **would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project...**”

The analysis of alternatives shall focus on alternatives “**which are capable of avoiding or substantially lessening any significant effects of the project**, even if these alternatives would impede to some degree the attainment of project objectives, or would be more costly.”

**The selection and discussion of alternatives is intended to foster meaningful public participation** and informed decision making.

(bold added)

Despite the current restrictions on public gatherings, there needs to be a process for “meaningful public participation” to occur in discussing alternatives.



## How to restore natural stream flows to the Hahamongna basin:

1. Measure the percolation rate of the Arroyo Seco stream before water reaches the dam.
2. Propose to RBMB that PWP receive pumping credit for agreed flows the stream will absorb before water hits the dam or at an agreed alternate point of absorption upstream of the dam.
3. At the bare minimum, PWP should receive pumping credit for all mean flows (3 cfs or below) that will be left in the stream channel; these flows are always absorbed well before the dam. This will ensure flows are left in the natural stream for over 90% of the year. This also removes the scenario of low flows sitting stagnant in settlement basins during summer months. Note: under the project proposal new settlement basins will be lined with concrete. Leaving flows in the stream during low flows will improve the rate and quality of water percolated into the aquifer.
4. Based on the agreed credit from the streamflow, use the existing spreading basins for additional flows up to 25 cfs. E.g. If it is agreed PWP receives credit for 5 cfs left in the stream as those flows do not reach the dam, then an additional 20 cfs would be diverted into the existing spreading basins when conditions allow.
5. Ensure that PWP receives pumping credit for agreed streamflow capture regardless of conditions. Pumping credit based on streamflow will remain constant even when flows exceed the agreed stream percolation capacity.

## **Benefits of restoring natural flows:**

1. Restoring natural flows will enhance the natural environment along the lines of the City's General Plan.
2. Water left in the stream during lower flows is absorbed into the underground without sitting in surface ponds. Water quality will be higher than if left stagnating in surface ponds.
3. Loss of water through evaporation during summer months will be reduced.
4. If the spreading basins do not have to be expanded, it opens up areas of Hahamongna for habitat restoration. Mitigation from the LA Co. Flood Control Devil's Gate Cleanout could be done "on site".
5. If the old JPL parking lot area is set aside for habitat restoration it avoids percolating the local water supply through an area that has absorbed the residue of 1000 cars a day for several decades.
6. Allowing PWP pumping credit based on natural flows in the Arroyo Seco aligns with how Lincoln Avenue Water Company receives pumping credit from RBMB. Credit is awarded based on streamflow measurement alone.
7. PWP will receive pumping credit during high flow storm events. E.g. During storm flows of 500 cfs PWP cannot divert water; they have to wait several days after the storm before flows slow and clear so diversion can occur. PWP loses pumping credit during this period as there is no diversion. If PWP receives credit for agreed streamflow percolation, they can receive credit during high flow periods. This extra credit will likely account for much of the additional 1100 acre feet the project wishes to capture. This will be a significant cost saving.

## The Current Situation with the natural stream

The following slides and photographs are based on observation of the 2019/2020 rain season. The map is from satellite photos from the JPL bridge downstream to the dam.

### **Observation focused on:**

#### 1. The “Pre-Storm” period on March 10, 2020:

Around 24 hours before a major storm is forecast PWP turn off stream diversion. This means all flows are left in the stream. The window between when this occurs and the storm reaches its height is a good opportunity to observe the percolation capacity of the stream.

Note: During this period there is no inflow to the stream from storm drains.

#### 2. The “Post-Storm” period on April 30, 2020:

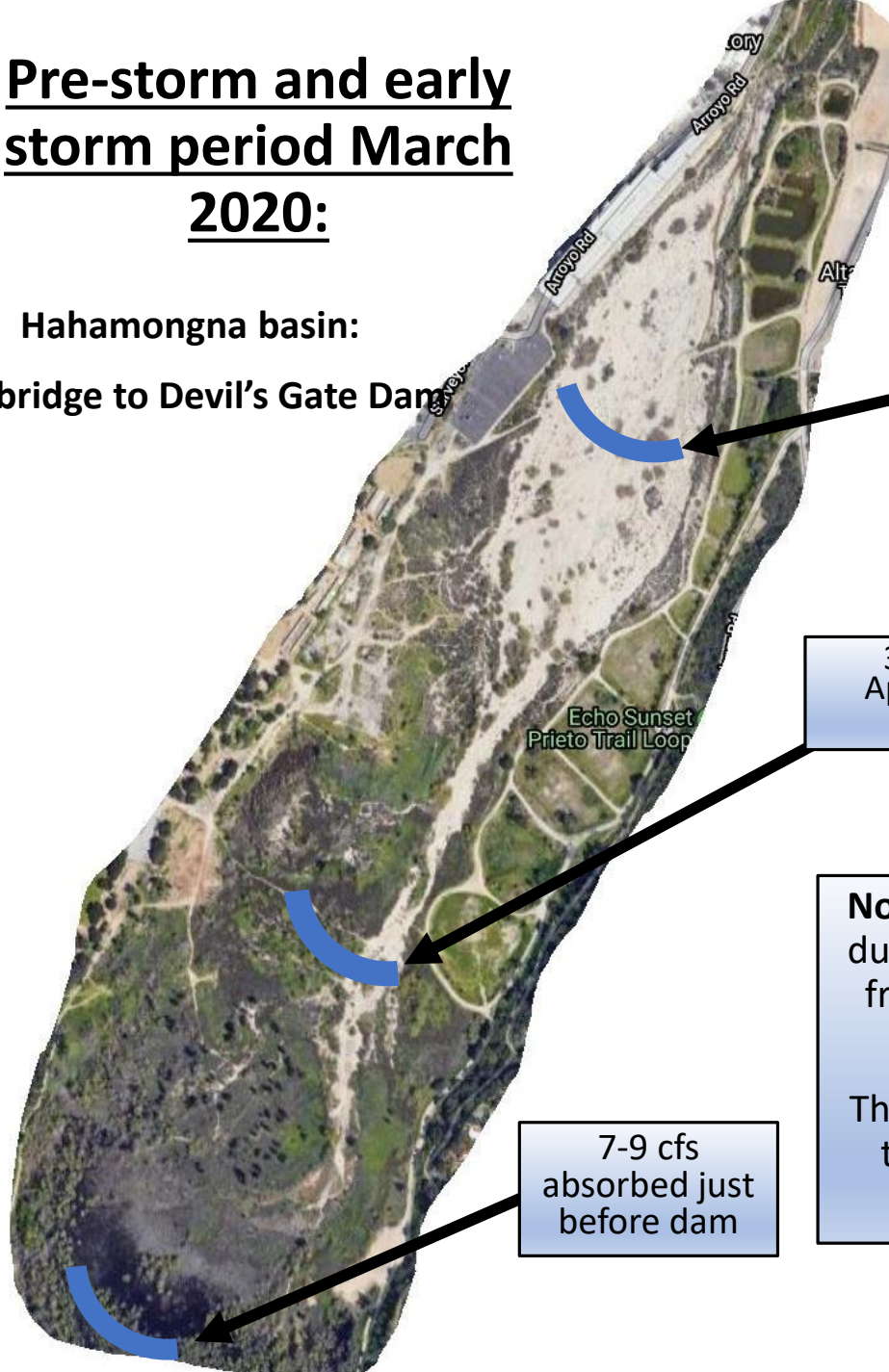
Observation was made after storm flows dropped to just under 10 cfs. Most flows are diverted. Around 1.5 cfs remain in the stream. The observation looks at the percolation capacity and water quality in the stream vs. spreading basins.

Note: This observation was taken well after any inflows to the stream from storm drains had ceased.

# Pre-storm and early storm period March 2020:

Hahamongna basin:

JPL bridge to Devil's Gate Dam



During periods without diversion natural flows were absorbed at the following points:

1-2 cfs absorbed here

3-5 cfs absorbed here. Approximately level with Johnson Field

**Note:** In 1919 LA Co. Flood Control dug a straight channel in the stream from just above Johnson Field to the dam.  
The channelization likely impacted the percolation capacity of the stream.

7-9 cfs absorbed just before dam

- ### Key Observations:
1. Hydraulic conductivity (percolation) in the stream zone is compromised since the influx of debris in 2009/10. Philip Williams, in 2000, estimated the stream could absorb up to 25 cfs before reaching the dam.
  2. Mean flows even during the rain season are 3 cfs or below. Mean flows in the Arroyo Seco, if left in the stream, are still absorbed before the stream reaches Johnson Field the last of the spreading basins. This is well before the dam.
  3. Water quality in the stream zone is substantially better than in the spreading ponds. The spreading ponds produce significant amounts of algae as soon as flows decrease.
  4. Raymond Basin Management Board could, at a minimum, award pumping credit to PWP for mean flows absorbed by the stream without jeopardizing the pumping agreement.



## March 10 2020 – settlement basin:

- Diversion stopped on March 8 due to storm forecast. Photo 1 shows the dry inlet to spreading basin #1.
- Photo 2 shows the dry inlet pipe to the first settlement basin. Flow is off.
- Photo 2 -- within 48 hours of the flows ceasing, water quality in the settlement pond deteriorates and generates algae. PWP receives pumping credit for this diverted “surface water”.
- Photo 3 shows that water from the settlement pond leaks back into the stream. Under “the law” this water should be deducted from PWP credit.
- The leaked water is poor quality with a pollution “foam”.



## March 10 2020 the natural stream:



- Photo 1 shows the natural stream channel just downstream of the leakage point from the settlement basin. This is about 50 yards below the JPL bridge.
- Clear flows on left of the stream are natural non-diverted flows. Cloudy flows on right are the leaked water from the settlement basin.
- Photo 2 is 70 yards downstream. Flows are all clear, the stream has absorbed and cleansed the leaked water from the settlement basin.
- Photo 3 is 200 yards downstream all flows are absorbed. The water remains clear right up to the point of total percolation.



### Key Observations:

- During very low flows, < 2 cfs, water in the natural stream channel is completely absorbed  $\frac{3}{4}$  mile upstream of the dam. Low summer flows, if left in the stream, would follow this path.
- Flows in the stream are naturally aerated creating greater surface water quality.

## Post-storm flows -- April 30 2020 – the spreading basins:



- The photos represent flows of 8-9 cfs after the high storms over April 4/5 when maximum flows reached 500 cfs.
- Estimated PWP diversion at this time is around 8 cfs. Around 1.5 cfs remain in the stream. Photo 1 is the inlet to spreading basin #1.
- At this diversion rate water fills spreading basin #1 and #2 with a small flow entering basin #3.
- Photo 2 is spreading basin #1. Due to the poor percolation rate, water is stagnating.
- Photo 3 is at the weir between spreading basin #2 and #3. There is a significant amount of algae. Water quality is poor.



## Post-Storm -- April 30 2020 the natural stream:



- Flows of around 1.5 cfs are left in the natural stream
- Photo 1 is adjacent to settlement pond #1 up the bank to the right.
- Flows are completely absorbed 150 yards downstream .75 miles from the dam.
- Water quality remains good throughout the stream zone right up to absorption.



Flows left in the stream absorbed here.



## In Summary:

The LA County Flood Control Devil's Gate Cleanout will remove all vegetation from the lower portion of the Hahamongna basin. The PWP Arroyo Seco Canyon Project will divert "all low flows" from the stream.

These two projects will have a significant cumulative impact on the natural environment. This cumulative impact undercuts the objectives for the Arroyo Seco in the City of Pasadena General Plan and the intent of returning the area back to its Native American name: Hahamongna – "Flowing Water Fruitful Valley".

The science paid for by PWP and the City of Pasadena suggest that restoring natural flows to the Arroyo Seco will improve the quality and quantity of water captured for local use.

The law, as written, provides for flexibility in how water is "spread" in the Arroyo Seco. RBMB already adjudicates pumping credit to other agencies based on recorded streamflow – this practice should be extended to the Arroyo Seco.

RBMB are charged to ensure a sustainable water supply with a focus on water quality and protection from drought. Their Charter binds them to promote efficient mechanisms for conducting water into the underground. Storage above ground results in waste and poor water quality and is unnatural in our hot, dry and fragile Mediterranean climate.

The current proposals under the Arroyo Seco Canyon Project are not supported by science. Public funds issued under Proposition 84 were not granted to PWP on the basis of increasing stream diversion into expanded spreading basins. Taxpayer money must be spent in accordance with the wishes of the voting public.