

Step 1

**General Information**

City:	Dry Spell
State:	CA

	Existing
Population Served by Project (P):	75,000
Average water use rate (gallons per capita per day)	170

Step 2

**Project and Cost Information**

Maximum Volumetric Pumping Rate (million gallons per day):	5
Average depth to recoverable water (feet)	225
Estimated Capital Cost of ASR Project (Present Value \$US)	\$ 3,000,000
Annual Operations and Maintenance Cost (Present Value \$US)	\$ 100,000
<b>Useful Life</b>	<b>30</b>
<b>Annualized Cost</b>	<b>\$ 4,240,904</b>

Step 3

**ASR Project Drought and Mitigation Information**

<b>Drought Recurrence Interval (years)</b>	<b>25</b>	<b>50</b>	<b>100</b>	
Unconstrained Potable Water Demand (million gallons per day [mgd])	13.1	13.8	14.4	
Pre-mitigation System Supply Yield (SSY <sub>pre</sub> , mgd)	12.5	11.7	10.8	
Pre-mitigation Duration of Impact (DOI <sub>pre</sub> , days)	30	45	60	
Pre-mitigation Conditions % of Unmet Demand (DLF <sub>pre</sub> , %)	5%	15%	25%	0%
Post-mitigation System Supply Yield (SSY <sub>post</sub> , mgd)	13.1	12.8	12.3	
Post-mitigation Duration of Impact (DOI <sub>post</sub> , days)	0	35	45	
Post-mitigation Conditions % of Unmet Demand (DLF <sub>post</sub> , %)	0%	7%	15%	0%
Average Yield of ASR Project (mgd)	0.66	1.10	1.50	-

Recommend three, minimum of one return periods

Step 4

**ASR BCA Module Output**

<b>Drought Recurrence Interval (years)</b>	<b>25</b>	<b>50</b>	<b>100</b>	
Pre-mitigation Damages (PreDmg)	\$ 11,167,343	\$ 52,899,457	\$ 115,875,000	\$ -
Pre-mitigation Annualized Damages	\$ 486,105	\$ 782,926	\$ 1,158,738	\$ -
Post-mitigation Damages (PostDmg)	\$ -	\$ 19,592,391	\$ 50,695,313	\$ -
Post-mitigation Annualized Damages	\$ -	\$ 315,157	\$ 506,948	\$ -

Last step for spreadsheet prior to input into FEMA BCA Tool v5.2  
FEMA BCA Tool equation

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Total Pre-mitigation Annualized Damages	\$ 2,427,769
Pre-mitigation Annualized Damages Present Value	\$ 30,126,286

FEMA BCA Tool equation  
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Total Post-mitigation Annualized Damages	\$ 822,105
Post-mitigation Annualized Damages Present Value	\$ 10,201,535

FEMA BCA Tool equation  
FEMA BCA Tool equation

Mitigation Benefits	\$ 19,924,751
Mitigation Cost	\$ 4,240,904
Benefits Minus Costs	\$ 15,683,847
<b>Benefit-Cost Ratio</b>	<b>4.7</b>

FEMA BCA Tool equation  
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**Additional Standard Values**

Discount Rate	7%
Economic Value of Loss of Water Service (LWS, per person per day)	\$103

Standard FEMA value  
Standard FEMA value