Agricultural-to-Urban Water Conservation Transfers: Imperial Irrigation District’s Efficiency Conservation Programs

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Colorado River Basin State Entitlements

Upper Basin (7.5 MAF)  
Lower Basin (7.5 MAF)  
IID (3.1 MAF)  
Mexico
IID’s Water Supply & Service Area

- 3,100,000 acre-feet annual Colorado River consumptive use entitlement
- 1,061,637 – gross acres within boundaries
- 520,307 – total acreage receiving water
- 471,682 – total farmable acreage
- Imperial Dam diversion structure, headworks and six desilting basins
- 82-mile long All-American Canal
Irrigation and Drainage System

- 1,590 miles of conveyance facilities
- 1,457 miles of surface drains
Permanent Crops

- Permanent crops make up less than 5% of the total acreage.
- Feedlots, Sheep, Asparagus, Citrus, Aviary (Bees), Duck Ponds
Garden Crops

- Garden Crops account for nearly 26% of total acreage.
- Carrots, Lettuce, Melons, Cauliflower, Onions, Flowers
Field Crops

- Field Crops account for over 69% of total acreage.
- Alfalfa, Bermuda Grass, Sudan Grass, Wheat, Sugar Beets
## 2018 Top 14 Crops (Acres)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acres</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>138,453</td>
<td>30.6%</td>
</tr>
<tr>
<td>Bermuda Grass</td>
<td>55,587</td>
<td>12.3%</td>
</tr>
<tr>
<td>Sudan Grass</td>
<td>48,692</td>
<td>10.7%</td>
</tr>
<tr>
<td>Lettuce</td>
<td>32,069</td>
<td>6.5%</td>
</tr>
<tr>
<td>Sugar Beets</td>
<td>25,632</td>
<td>5.7%</td>
</tr>
<tr>
<td>Wheat</td>
<td>22,181</td>
<td>4.9%</td>
</tr>
<tr>
<td>Klein Grass</td>
<td>17,932</td>
<td>4.0%</td>
</tr>
<tr>
<td>Carrots</td>
<td>15,897</td>
<td>3.5%</td>
</tr>
<tr>
<td>Onions</td>
<td>12,912</td>
<td>2.9%</td>
</tr>
<tr>
<td>Broccoli</td>
<td>12,282</td>
<td>2.7%</td>
</tr>
<tr>
<td>Duck Ponds</td>
<td>9,664</td>
<td>2.1%</td>
</tr>
<tr>
<td>Sweet Corn</td>
<td>8,569</td>
<td>1.9%</td>
</tr>
<tr>
<td>Spinach</td>
<td>8,237</td>
<td>1.8%</td>
</tr>
<tr>
<td>Citrus</td>
<td>7,013</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

**Top 14 Crops Total Acres**: 412,682 (91.1%)

**Total Acreage of Crops at IID**: 452,976 (100.0%)
**Water Conservation & Transfer Programs**

- **Salton Sea Mitigation Fallowing**
  - 800,000 AF (2003-2017)

- **IID/CVWD Agreement**
  - 103,000 AF/yr

- **IID/SDCWA Agreement**
  - 200,000 AF/yr

- **AAC Lining Project**
  - 67,700 AF/yr

- **IID Miscellaneous PPRs**
  - 11,500 AF/yr

- **1988 IID/MWD Agreement**
  - 105,000 AF/yr

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System Conservation Program - Flexibility

Increases operational flexibility to provide water management opportunities.

- Main canal seepage interception and recovery systems
- Lateral interties
- Main system and mid-lateral operational reservoirs
- Groundwater recovery, storage and conjunctive use projects
On-Farm Efficiency Conservation Program

- Program is designed for maximum flexibility to allow for broad farmer participation and a wide variety of crops and growing seasons
- Incentivizes landowners and tenants to reduce water deliveries by improving on-farm water use efficiencies
- Conservation is measured relative to a ten-year historical baseline specific to each field and crop
- Payment rate = $285/AF
- 4 AF/AC payment cap

- 2008 conservation yield = 581 AF
- 2009 conservation yield = 236 AF
- 2013 conservation yield = 17,276 AF
- 2014 conservation yield = 44,371 AF
- 2015 conservation yield = 87,721 AF
- 2016 conservation yield = 138,585 AF
- 2017 conservation yield = 151,750 AF
- 2018 conservation yield = 190,969 AF

Total OFECP conservation > 631,000 AF
Conservation Potential

District-Wide Water Balance
- Updated to 1998—2005 period
- Covers canal system and irrigated lands separately
- Identifies where to look for savings, does not consider cost or technical challenges
- Maximum conservable losses:
  - 124,000 AF canal spillage
  - 86,000 AF canal seepage
  - 433,000 AF farm tailwater

MEAN (1998-2005) ANNUAL AAC WATER DESTINATIONS IN THOUSANDS OF AC-FT

<table>
<thead>
<tr>
<th>Destination</th>
<th>Value</th>
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<tbody>
<tr>
<td>AAC INFLOW AT MESA LATERAL 5</td>
<td>2,875</td>
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<tr>
<td>MAIN CANAL SPILL</td>
<td>3</td>
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<tr>
<td>LATERAL SPILL</td>
<td>121</td>
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<td>CANAL SEEPAGE</td>
<td>86</td>
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<tr>
<td>NET EVAPORATION</td>
<td>22</td>
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<tr>
<td>ON-FARM DELIVERY</td>
<td>2,549</td>
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<tr>
<td>NET CROP ET</td>
<td>1,699</td>
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<tr>
<td>TAILWATER</td>
<td>433</td>
</tr>
<tr>
<td>TILE WATER</td>
<td>417</td>
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<tr>
<td>M&amp;I DELIVERY</td>
<td>89</td>
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<tr>
<td>CONSUMPTION</td>
<td>55</td>
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<tr>
<td>RETURN FLOW</td>
<td>34</td>
</tr>
<tr>
<td>SALTON SEA MITIGATION</td>
<td>5</td>
</tr>
</tbody>
</table>
The Salton Sea

- 360 square miles, up to 52’ deep
- Congressionally designated agricultural sump for IID/CVWD
- Volume of 7.5 MAF with annual inflow of up to 1.3 MAF, no outflow
- Nearly 50% saltier than the ocean
- Repository for agricultural drainage
- Heavily used by migratory waterfowl including endangered species
- > 7’ elevation decline since 2003; despite the replacement of conserved water reductions through the delivery of mitigation water
- Without transfers, Sea was estimated to turn hypersaline between 2010 and 2025
- With transfers, Sea is estimated to turn hypersaline 1-9 years earlier
Salton Sea Elevation @ Fig Tree John
(2003 – 2018)

2003 - 227.47'

2018 - 235.56'

- 8.09'
Why restoration?
## California’s Phase I Salton Sea Management Plan

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<tbody>
<tr>
<td><strong>Total Projected Salton Sea Exposed Playa Acreage</strong></td>
<td>18,625</td>
<td>22,172</td>
<td>26,381</td>
<td>31,427</td>
<td>42,540</td>
<td>47,863</td>
<td>52,752</td>
<td>57,067</td>
<td>60,905</td>
<td>64,200</td>
<td>66,948</td>
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<td><strong>Annual Projected Increase in Exposed Playa Acreage</strong></td>
<td>3,547</td>
<td>4,209</td>
<td>5,046</td>
<td>5,584</td>
<td>5,529</td>
<td>4,889</td>
<td>4,315</td>
<td>3,838</td>
<td>3,295</td>
<td>2,748</td>
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<td><strong>Cumulative Projected Increase in Exposed Playa Acreage</strong></td>
<td>3,547</td>
<td>7,756</td>
<td>12,802</td>
<td>18,386</td>
<td>23,915</td>
<td>29,238</td>
<td>34,127</td>
<td>38,442</td>
<td>42,280</td>
<td>45,575</td>
<td>48,323</td>
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<td><strong>Annual Playa Acreage Coverage Milestones</strong></td>
<td>500</td>
<td>1,300</td>
<td>1,700</td>
<td>3,500</td>
<td>1,750</td>
<td>2,750</td>
<td>2,700</td>
<td>3,400</td>
<td>4,000</td>
<td>4,000</td>
<td>4,200</td>
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<tr>
<td><strong>Cumulative Playa Acreage Coverage Milestones</strong></td>
<td>500</td>
<td>1,800</td>
<td>3,500</td>
<td>7,000</td>
<td>8,750</td>
<td>11,500</td>
<td>14,200</td>
<td>17,600</td>
<td>21,600</td>
<td>25,600</td>
<td>29,800</td>
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<tr>
<td><strong>Projected SSMP Cost</strong></td>
<td>$10M</td>
<td>$27M</td>
<td>$35.5M</td>
<td>$43.5M</td>
<td>$33.5M</td>
<td>$35.5M</td>
<td>$34M</td>
<td>$42.5M</td>
<td>$47.5M</td>
<td>$37.5M</td>
<td>$36.5M</td>
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**District**

$80M available funding  $200M Prop 68 bond funding  $120+M funding shortfall

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IID's QSA Water Conservation & Transfer Summary
(2003-2018 Total = 5,288,696 AF)

- San Diego County Water Authority Conservation 21%
- All-American Canal Lining 13%
- IID/MWD Efficiency (1988 Agreement) 31%
- Salton Sea Mitigation Conservation 14%
- Exhibit C Payback Conservation 3%
- Intentionally Created Surplus 7%
- Coachella Valley Water District Conservation 6%
- IOPP Conservation Payback 5%