Owens Lake
Dust Mitigation Program

Presenter: Jaime Valenzuela, PE
Owens Lake Background

Where: 220 miles north of Los Angeles
Owens Lake Dust

WHY?

BEFORE DUST MITIGATION
70 to 110 MPH Gusts of Wind

PM10 Dust

Sand

Turbulent flow
1913
- Owens natural end point for Owens River, LAA completed, Owens River diverted to Los Angeles. Owens Lake slowly dried out and became a source of dust.

1987
- EPA establishes NAAQS PM10 Standards (150µg/m^3), Owens Lake is classified as a serious area of non-attainment.

1998
- GBUAPCD adopts first State Implementation Plan (SIP) for attainment of NAAQS. Enforceable under Health and Safety Code 42316.

2000
- LADWP Starts Dust Mitigation Projects on Owens Lake. Failure to comply would result in fines of up to $10,000/day

2011
- Dust mitigation orders continue with no end in sight, LADWP contests new orders

2013
- Settlement Agreement, limit set at 53.4 square miles of Dust Control defined by the historic 3,600 ft elevation shoreline.

2018
- 10 projects, 48.6 square miles of dust mitigation completed to date
Best Available Control Measures (BACM)

Shallow Flooding

Sprinkler Shallow Flood

DECREASING WATER DEMAND
Managed Vegetation

Brine

DECREASING WATER DEMAND
Tillage

DECREASING WATER DEMAND

Gravel

BACMs
Managed Vegetation

- Sand Flux
- Satellite Imagery
- Ground Truth (DPF)

Shallow Flood

- LiDAR
BACM Compliance

Tillage

- Ridge Dimensions
- Sand Flux
- Clod Size
- Drone Test

Gravel
- Aerial Photos
- Site Inspections
Variable Water Cover Treatments

Figure 5.8 - Shallow Flood control efficiency curve

Water Cover / Control Efficiency Curve
Challenges

- (climate Change)
  Excess Snowmelt
- Soft Saturated Soils
- Corrosive Soils
- 75 to 100 mph Gusts
Resource Protection

- Habitat Value
- Public Trust Value
- Archaeological
- Paleontological
- Tribal/Cultural
Balancing our Goals: Public Access & Cultural
### Balancing our Goals: Habitat

#### 6 wildlife guilds

#### 11 habitat variables

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Achieved to Date

- 10 Capital Projects Completed Since 2000
- 48.6 sq-mi completed
  - 4.8 sq-mi contingency
- 98.6% Dust Emissions Reduction
  - Dust Emissions Reduction of 75,000 Tons/Yr
Achieved to Date

1998

Owens Lake

Pre-dust controls

(1998 Space Shuttle)

2018

48.6 mi²
Total Dust Mitigation

- **Shallow Flood**: 32.2 sq-mi
- **Managed Vegetation**: 5.8 sq-mi
- **Gravel**: 5.4 sq-mi
- **Tillage**: 4.4 sq-mi
- **Sand Fence**: 0.3 sq-mi
- **Other**: 0.5 sq-mi

2018
• Total Cost: $2.1 Billion: Capital (55%), O&M (18%), Water (21%), Regulatory Fees (6%)
Owens Lake: Infrastructure

- 127.6 miles of roads and berms
- 31.8 miles of mainline (54” - 72”)
- 146.6 miles perforated drain pipe
- 3,600 miles of drip irrigation
- 394.6 miles of Irrigation pipeline (2” - 4”)
- 35 Pump Stations
Possible Next Steps

- Maintain compliance with NAAQS
- Replace and enhance aging infrastructure.
- Convert existing water intense DCMs into water efficient DCMs, while:
  - Achieving dust performance standards
  - Maintaining habitat,
  - Conserving water,
  - Mitigating impacts to public trust, environmental & cultural resources
- Test new water efficient dust mitigation methods.