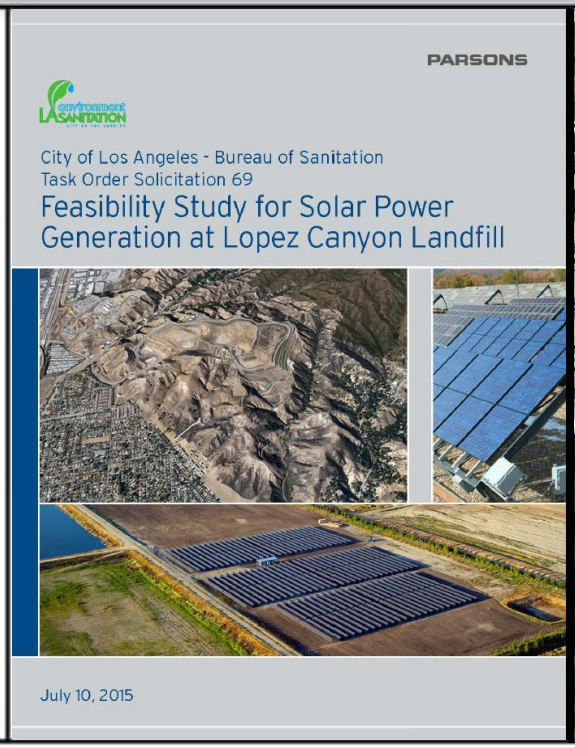
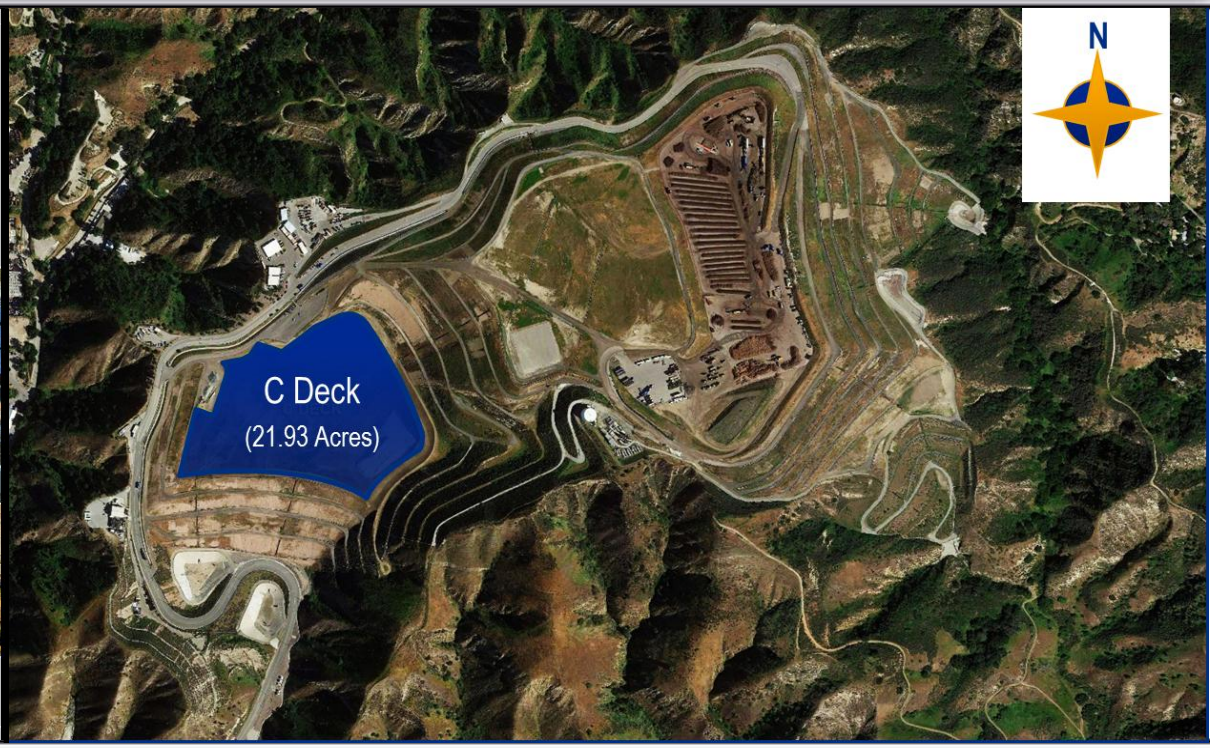
Overview of Feasibility Study for Solar Power Generation at Lopez Canyon Landfill





October 1, 2015

Feasibility Study Objective

Assess the technical, financial, and administrative feasibility of installing a photovoltaic solar system at the **Lopez Canyon Landfill**

Solar power generated would be used in part to offset LASAN energy usage

Feasibility Study Aspects

- Project background
- Site selection and potential capacity
- PV solar technologies
- Landfill solar system case studies
- Environmental and regulatory considerations
- Cost analysis
- Community concerns and visibility study
- Recommendations

Project Background

- Property comprises 397 acres / 166 disposal areas
- Landfill operation from 1975-1996
- Final closure in 2011
- Currently zoned as Open Space
- Closed landfill continues to generate landfill gas and settle
- Development into beneficial reuse after 30 years of closure
- Proposed interim use of C Deck for solar generation

PV Solar System Capacity

Feasibility Study evaluated AB+ and C Decks
for an up to 8MW solar system

As study progressed staff requested
to concentrate on use of C Deck…

*…which could easily accommodate a **4MW solar system***

The current feasibility study is for a 4MW solar system at C Deck
The 4 MW Fixed Tilt Solar System will produce almost 6,700,000 kWh/year

PV Solar System - Site Selection

Existing Solar Technologies and Installation Methods

Fixed-Tilt Solar Array

Mounted at a fixed angle, to provide the least cost solar energy generation; one of the most commonly used methods

Single Axis

Solar panels rotate along one axis to continually face the sun; generally more land intensive and costly to install than fixed-tilt systems.

Existing Solar Technologies and Installation Methods

Dual Axis

Optimize solar energy using the ability to rotate the panels to follow the sun both vertically and horizontally

Flexible Solar Photovoltaic

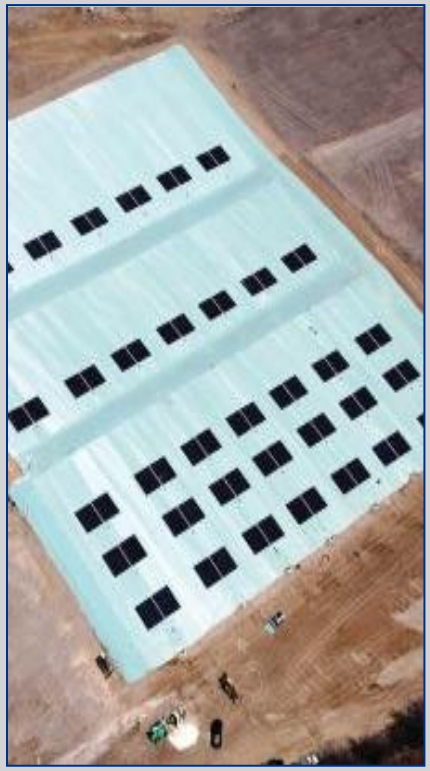
Adapts to landfills' natural contours
Limited experience, less output, more costly

Landfill Solar System - Case Studies

Tequesquite Sanitary Landfill
Riverside, CA
6-10 MW

Box Canyon Landfill
Camp Pendleton, CA
1.4 MW

Hickory Ridge Landfill
Conley, CA
1 MW



Tessman Road Landfill
San Antonio, TX
9 MW

Evaluated Environmental and Regulatory Concerns

- **Glare** – Antireflective coating will be applied to panels to minimize glare
- **Biological resources** – Animal injuries/deaths not expected as a result of the solar operation
- **Land use/recreational resources** – Operation will accommodate adjacent recreational facility
- **Water use guidelines** – Panel washing will occur roughly twice per year and water use will be minimized

All relatively minor and can be mitigated

Evaluated Environmental and Regulatory Concerns

- **Discharge of wash water** – Wash water will be managed as part of operations and maintenance.
- **Operational noise and traffic** – Expected to be minimal; toll-free number will be available for community concerns.
- **Geotechnical considerations** – Will be factored into the design to address site conditions.
- **Conditional use permit** – New conditions and requirements may be issued as part of a new CUP or amendment to the existing CUP.

All relatively minor and can be mitigated

Preliminary Cost of 4MW Fixed-Tilt PV Solar System

Description of Item	Quantity	Unit	Unit Cost	Total Cost
1000 kW Inverter	4	EA	$130,000	$520,000
480 V Switchboard	2	EA	$200,000	$400,000
3 MVA Step-up Transformer	2	EA	$140,000	$280,000
38 kV Class Switchgear	1	EA	$1,000,000	$1,000,000
Racking systems, balance of systems hardware, earthwork and installation labor	1	LS	$4,000,000	$4,000,000
Solar Panels	17,000	EA	$400	$6,800,000
Total Estimated Cost				**$13,000,000**

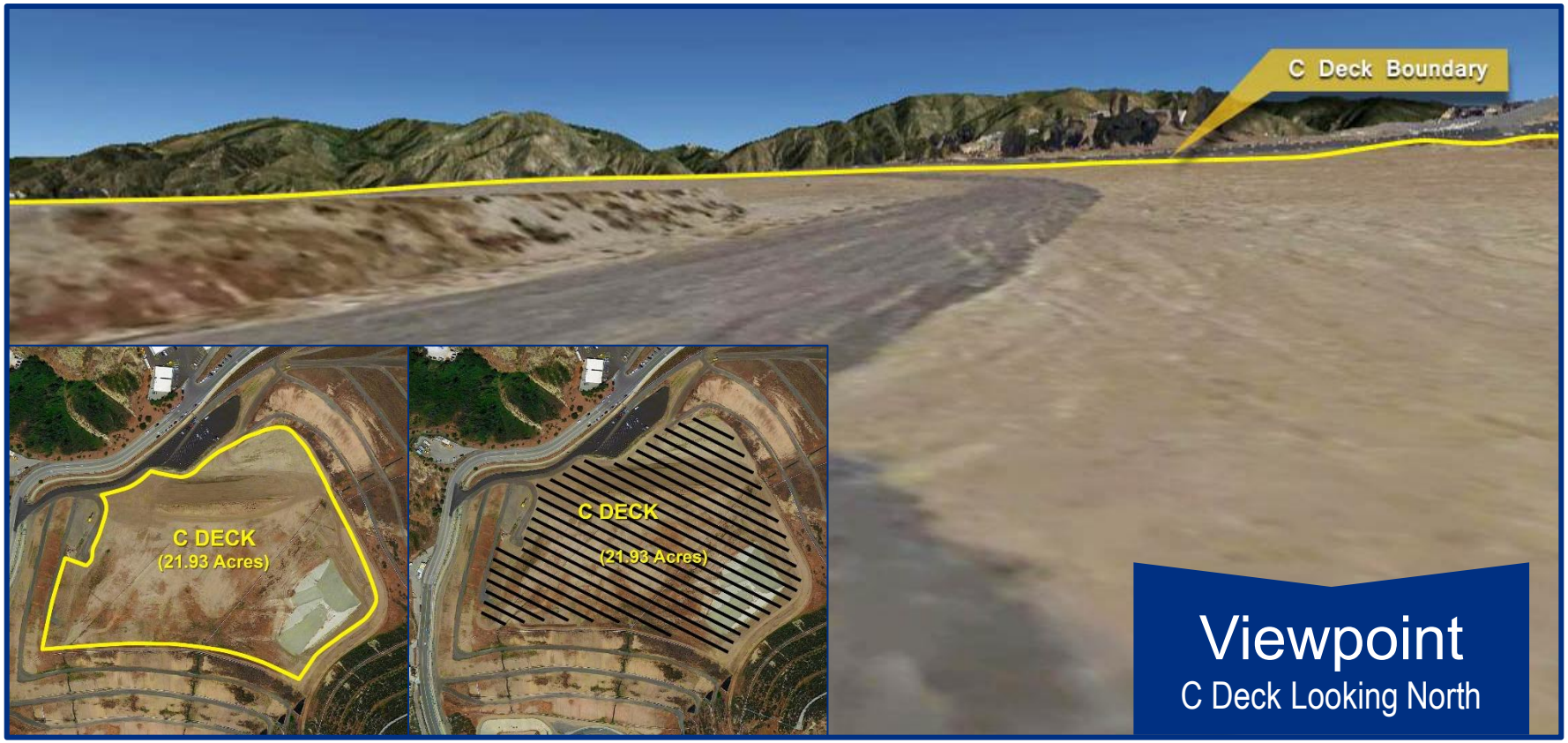
Community Concerns & Visibility Study (1 of 2)

- **Aesthetics and Visibility**
  - Viewing impact analysis conducted
  - C Deck not visible by Lake View Terrace, Upper/Lower Kagel Canyon
- **Benefit to the Community**
  - Potential reduction in LASAN fees
  - Brings LA closer to state goal of 33% renewable energy
- **Open Space Definition**
  - Solar proposed as interim use of C Deck until 30 years of closure
  - Integration with trails to be evaluated

Community Concerns & Visibility Study (2 of 2)

- **Public Comment**
  - LASAN will continue to involve community and solicit input on this project
- **Solar Generation under LADWP**
  - LADWP owns title to electricity generated
  - Solar owners with interconnected system must sell generation to LADWP
  - Owners compensated through SB1 with Net Metering or the Feed in Tariff

Ground Level View of C Deck



No Line-of-Sight Issues

Recommendations

- Consider building 4MW fixed-tilt PV solar system on disposal deck C with an estimated production of 6,682,825 kWh/year
- Take advantage of current Feed in Tariff incentives available from LADWP
- Evaluate the best financing options
- Consider integration of solar system with trail system as part of a master plan
- Further evaluate public & environmental concerns in the Environmental Study (CEQA)

Recommended System and Generation Capacity

- Recommended system: Fixed-tilt system
- Fixed-tilt solar arrays are one of the most common and lowest cost solar systems. This type of array typically requires 4 to 6 acres of open land per MW

System Technology	System Capacity using C Deck (MW)	Estimated Annual Generation (kWh/year)
Fixed Tilt	4 MW	6,682,825 kWh

Discussion