

Proposal to Permit, Design, Finance, Build and Operate an 8MWdc PV-Solar Facility on the Top Deck of the BKK Class III Landfill on Azusa Avenue...

April 24, 2019



The closed BKK Class III Landfill on Azusa Avenue...



...is ideal for the development of an 8 MW PV solar power facility for the City of West Covina.

Prepared for



City of West Covina

City Clerk's Office
1444 West Garvey Avenue, Ste. 317
West Covina, CA 91790

Prepared by



PVNavigator, LLC

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Digital Note:

1. This Proposal contains links to extra PVN SOQ materials. The links are only active in the electronic version of this Proposal.
2. This Proposal is also available at: <https://projectnavigatorltd.box.com/s/bthfi0fhu00fhauoj4k8lvsufacy38y5>

Proposal to Permit, Design, Finance, Build and Operate an 8MWdc¹ PV-Solar Facility on the Top Deck of the BKK Class III Landfill

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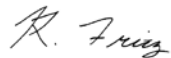
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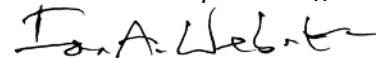


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¹ 8MWdc is the maximum PV solar facility size which can be accommodated (using commercially available 340W modules and standard racking spacing) on the 50-acre top deck of the Class III landfill.

This Proposal also discusses how a smaller facility could be installed using less space (e.g. 3MW on 15 acres), which might make the PV installation more compatible with other commercial development proposals which plan to utilize both the landfill and the opportunity site.

The Development of an 8MWdc Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA

Current Site Conditions



Conceptual Solar Development



What

- A 8 MWdc Photovoltaic (PV) Solar Development
- Multiple options for power sales:
 - Direct sales to City of West Covina.
 - Clean Power Alliance (CPA).
 - Southern California Public Power Authority (SCPPA).
 - Southern California Edison (SCE).
 - Power Sales to serve on-site remedy.
 - Power sales to other BKK landfill developments.
- Solar Installation: Fixed Tilt, Rack Mounted, Self Ballasted.
- Occupies approximately 40 acres of the top deck of the Class III landfill.
- Racks are specifically designed for landfill cap installations.
- No long-term cap impacts or environmental risks.
- Local community benefits from facility construction work.

Who

- A development Team anchored by Brea-based, PVNavigator, LLC (PVN) as the project integrator; (conceptualization, planning, permitting, power offtake, financing, design & construction).
- PVN specializes in developing utility scale distributed solar facilities on closed landfill sites.
 - e.g. Click [here](#), for information on PVN's 3MW PV installation at the Milliken Landfill, Ontario, CA.

When

- All permitting and design completed by Q3/Q4 2020.
- System installed and operational by Q3/Q4, 2021.

How

- PVN and City of West Covina initially enter into a "Lease-Option" which would cover the projects feasibility and interconnect phase, followed by a long-term land lease of 20-30 years covering system installation, operations and eventual demob.
- Multiple power sales options with a portion of revenues to be split with the City of West Covina.
- Project will be financed via a combination of debt and equity.

The BKK Class III Landfill Cap is Perfectly Suited for a Photovoltaic Solar Installation: Top Deck has Low Slope, is Geotechnically Stable, and Has Few Gas Collection Components

PVN completed a very similar project at the County of San Bernardino's Milliken Landfill in Ontario, CA 25 Miles to the east.



Click [here](#) for a timelapse video of construction at the Milliken Landfill.

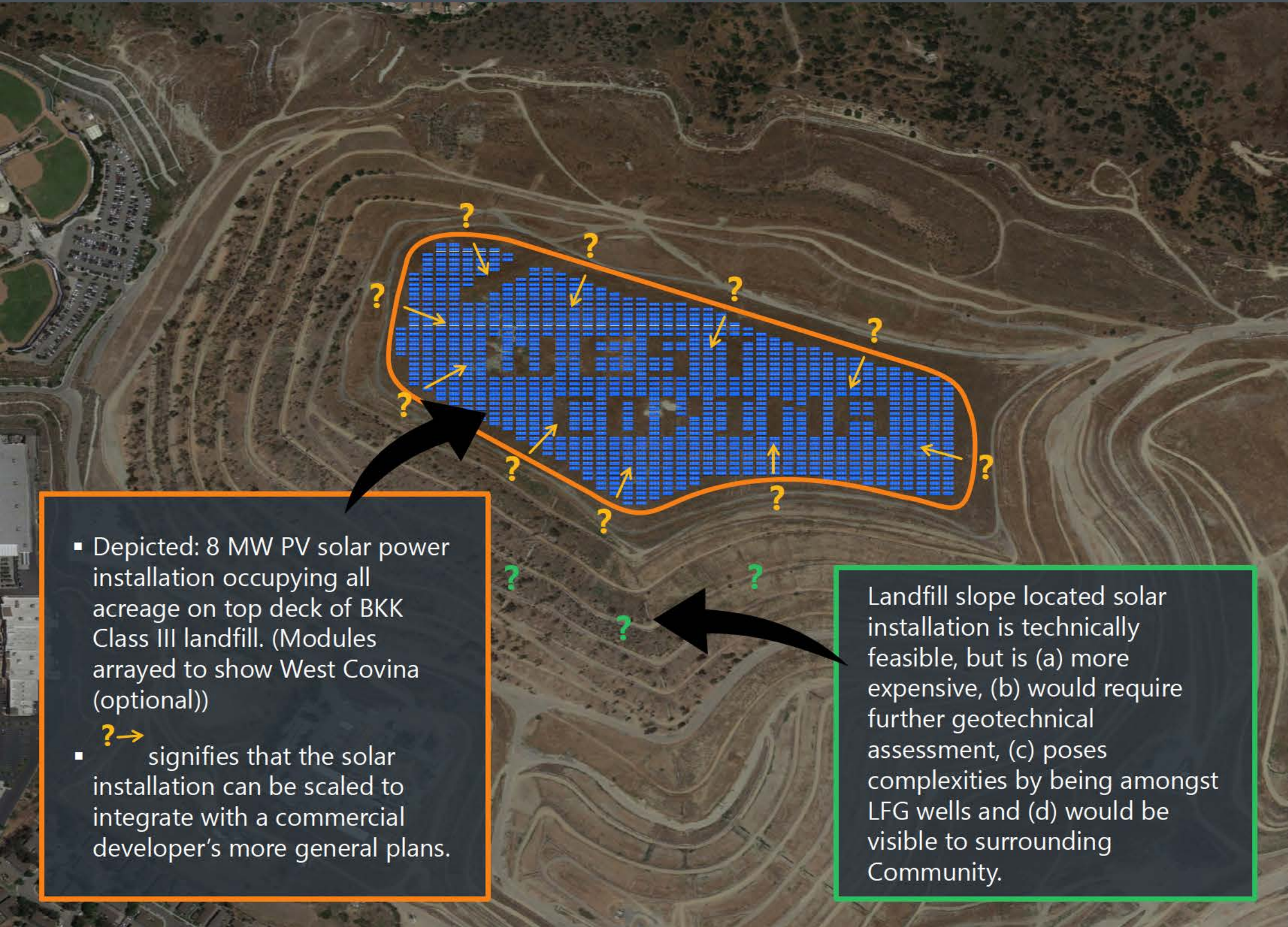
**WHICH CAN BE
READILY
DUPLICATED AT THE
BKK CLASS III
LANDFILL**



PVNavigator, LLC Seeks to Develop a Utility Scale PV Solar Installation on the BKK Class III Landfill's Top Deck.

PREFACE
FIGURE
3

PV Facility Can "Flexibly Integrate" with the More Traditional Plans of a Commercial BKK Site Developer or Stand Alone as an Independent Project.
(Note: Links only function in the [electronic version of this Proposal](#).)



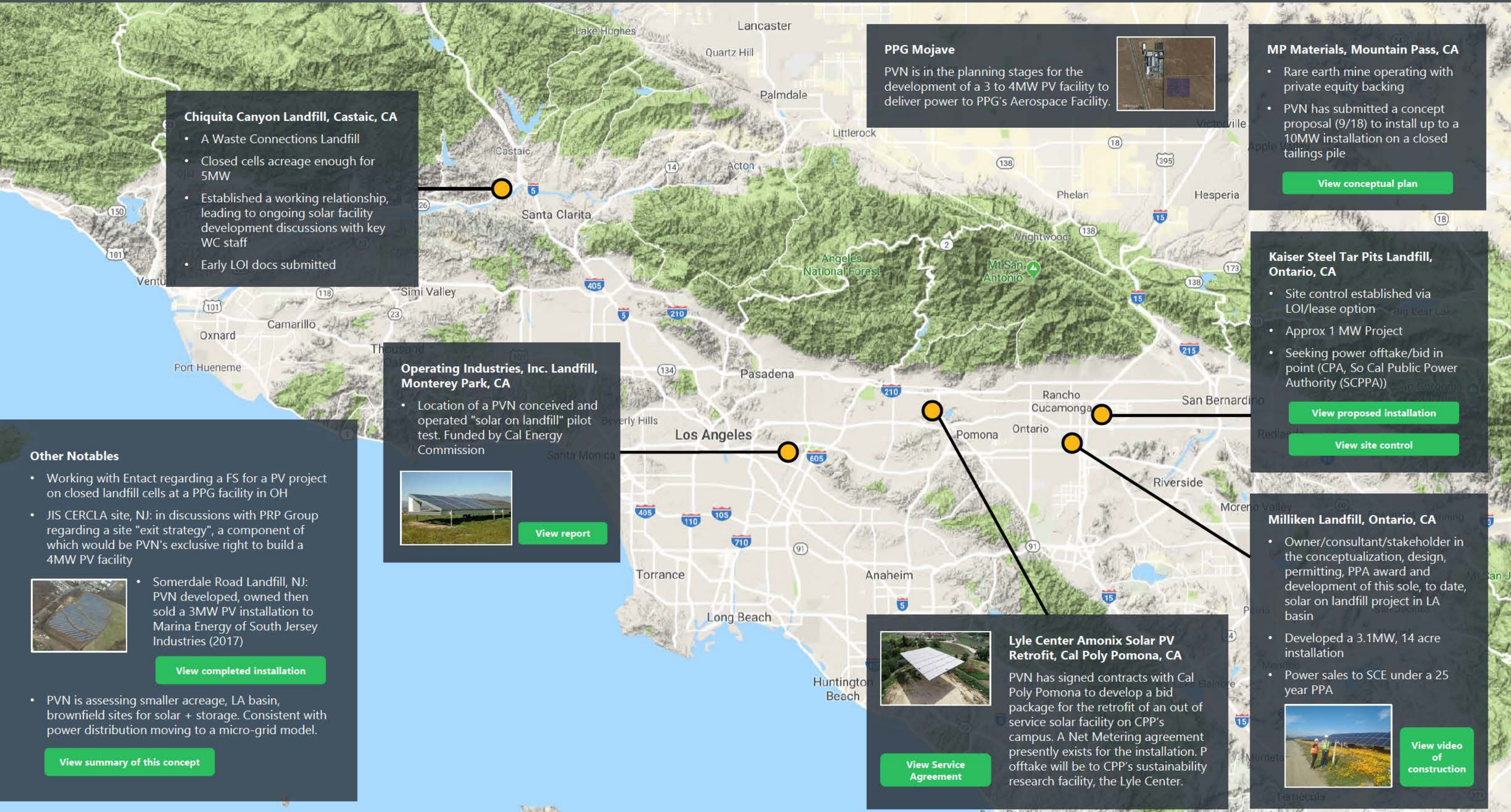
- Depicted: 8 MW PV solar power installation occupying all acreage on top deck of BKK Class III landfill. (Modules arrayed to show West Covina (optional))
- **?→** signifies that the solar installation can be scaled to integrate with a commercial developer's more general plans.

Landfill slope located solar installation is technically feasible, but is (a) more expensive, (b) would require further geotechnical assessment, (c) poses complexities by being amongst LFG wells and (d) would be visible to surrounding Community.

- PVN specializes in developing solar power projects on closed, capped, landfill sites...[especially in the Los Angeles area](#).
- Development process includes interconnect and power offtake analysis, ([Community solar?](#)) and project financing.
- PVN has developed the only, to date, PV solar-on-landfill project in the LA basin; viz, our [3.1 MW, 15-acre installation on the Milliken Landfill, Ontario](#).
- Other nearby solar-on-landfills projects are in progress; e.g. at [LA County's Spadra Landfill, Pomona](#).
- PVN has a detailed understanding of BKK permitting processes via DTSC and the City; and also, in general, the [solar-on-landfill permitting strategy](#).
- If the full acreage of the Class III landfill's top deck is used, then a project with the following metrics could be developed ([PVN calculations via HelioScope](#))
 - 8 MWdc on 40 acres; 14 GWh per year; 340W capacity modules
- More at www.PVNavigatorLLC.com and www.LandNavigator.org.

PVNavigator, LLC Has Been Assembling a Portfolio of Environmentally Impacted Sites (esp. Closed Landfills) on Which to Develop MW-Utility-Scale PV Solar Power Installations.

Figure describes some of PVN's recent activities in the Los Angeles Basin. (Note: Links only function in the [electronic version of this Proposal](#).)



Chiquita Canyon Landfill, Castaic, CA

- A Waste Connections Landfill
- Closed cells acreage enough for 5MW
- Established a working relationship, leading to ongoing solar facility development discussions with key WC staff
- Early LOI docs submitted

PPG Mojave

PVN is in the planning stages for the development of a 3 to 4MW PV facility to deliver power to PPG's Aerospace Facility.



MP Materials, Mountain Pass, CA

- Rare earth mine operating with private equity backing
- PVN has submitted a concept proposal (9/18) to install up to a 10MW installation on a closed tailings pile

[View conceptual plan](#)

Kaiser Steel Tar Pits Landfill, Ontario, CA

- Site control established via LOI/lease option
- Approx 1 MW Project
- Seeking power offtake/bid in point (CPA, So Cal Public Power Authority (SCPPA))

[View proposed installation](#)

[View site control](#)

Milliken Landfill, Ontario, CA

- Owner/consultant/stakeholder in the conceptualization, design, permitting, PPA award and development of this sole, to date, solar on landfill project in LA basin
- Developed a 3.1MW, 14 acre installation
- Power sales to SCE under a 25 year PPA



[View video of construction](#)

Lyle Center Amonix Solar PV Retrofit, Cal Poly Pomona, CA

PVN has signed contracts with Cal Poly Pomona to develop a bid package for the retrofit of an out of service solar facility on CPP's campus. A Net Metering agreement presently exists for the installation. P offtake will be to CPP's sustainability research facility, the Lyle Center.



[View Service Agreement](#)

Operating Industries, Inc. Landfill, Monterey Park, CA

- Location of a PVN conceived and operated "solar on landfill" pilot test. Funded by Cal Energy Commission



[View report](#)

Other Notables

- Working with Entact regarding a FS for a PV project on closed landfill cells at a PPG facility in OH
- JIS CERCLA site, NJ: in discussions with PRP Group regarding a site "exit strategy", a component of which would be PVN's exclusive right to build a 4MW PV facility



- Somerdale Road Landfill, NJ: PVN developed, owned then sold a 3MW PV installation to Marina Energy of South Jersey Industries (2017)



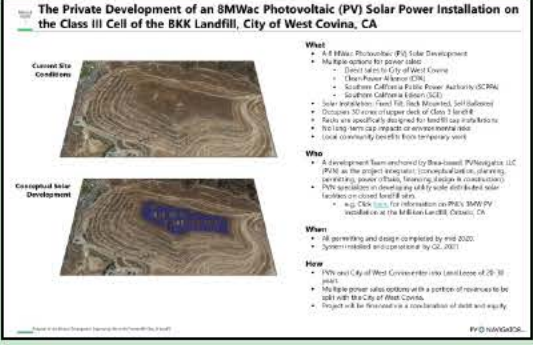

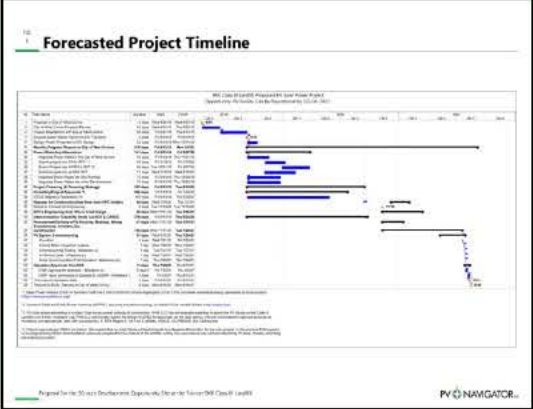
[View completed installation](#)

- PVN is assessing smaller acreage, LA basin, brownfield sites for solar + storage. Consistent with power distribution moving to a micro-grid model.

[View summary of this concept](#)

Proposal to Develop a PV Solar Power Project (3 to 8MW) on the Top Deck of the BKK Class III Landfill, West Covina, CA

(The City of West Covina's RFP Contains Certain Key Criteria, Especially as they apply to the Class III Landfill's Top Deck. They are Abstracted Here and Commented on Specific to a Proposed Top Deck Solar Power Development)

RFP Criteria	Notes Vs Criteria	Illustrative Figure
<p>1. Any Development on the BKK Class III Landfill will Require Landfill Post-Closure Reuse Permitting via DTSC, and Associated Agencies (e.g. US EPA, US ACE, U.S. Fish & Wildlife, CA Fish & Game, CA RWQCB & CalRecycle (see RFP, p.3, under Background & p.5, under Environmental Information, 2nd bullet)</p>	<ul style="list-style-type: none"> PVN has conceived, permitted, constructed and operated the only utility scale (3MW, 15 acre) PV facility on a closed landfill site in the Los Angeles basin at the County's Milliken Landfill in Ontario, CA PVN has a portfolio of similar sized, landfill located, solar power projects the company is planning and permitting in Southern California (see Preface Figure 4) All PVN's projects require discussions, planning, submittals, presentation and approvals from the above regulatory entities, with whom the firm has established, excellent working relationships. In addition, PVNavigator, LLC's sister company, Project Navigator, Ltd., performs as the BKK PRPs' Working Groups project coordinator, responsible for managing the final remedy on the adjacent BKK Class I Landfill. As such, PVN has access to site specific technical information, which will be needed for solar system design (e.g. existing cover design, historical geotechnical and landfill OM&M information and data). 	 <p>PVNavigator, LLC Has Been Assembling a Portfolio of Environmentally Impacted Sites (esp. Closed Landfills) on Which to Develop MW-Utility-Scale PV Solar Power Installations.</p>
<p>2. The Proposed PV Facility Will be Built on the Engineered Cover of the Class III Landfill. The Cover System will not be Penetrated or Compromised. (See RFP, p.3, under Background)</p>	<ul style="list-style-type: none"> PVN's will design the solar installation with a self-ballasted, racking system, which by its nature does not penetrate the landfill's cover. (See Preface Figure 2) This approach was used at our local Milliken landfill to rack more than 10,000 modules. The racks are anchored into concrete filled tubs, whose point load on the cap's surface is low enough to not cause penetration. Other geotech-related calculations are performed to prove that the total load of the PV system will not cause further landfill settlement. (Not that such a scenario is extremely unlikely for the BKK Class III landfill, where, with a 3.5 ft. soils thick cap in place for well over a decade, and the load of the proposed solar system only adding about 2% extra load onto the underlying (now compacted) wastes, further settlement is unlikely...but this will be confirmed during the solar system's design and permitting phases). 	 <p>The BKK Class III Landfill Cap is Perfectly Suited for a Solar Installation: Geotechnically, Geographically, and is Free of Gas Monitoring Equipment</p> <p>PVN completed a very similar project at the Milliken Landfill, 25 Miles to the west.</p>
<p>3. The City will consider all Development Proposals, Including Proposals Which Use a Portion of the Total Available Acreage. (See RFP, p.5, under Development Goals)</p>	<ul style="list-style-type: none"> PVN's proposal is for a PV solar development to be located only on the BKK Class III landfill's 50-acre top deck. The planned 8MW PV array, which would occupy the entire top deck of the landfill, is depicted in Preface Figure 1. Note however, in that the City, via your proposal process may receive proposals for other uses of parts of the landfill's top deck, PVN is willing to scale down our solar facility to occupy as low as 15-acres, (3 MW; same as Milliken in 2, above), potentially making the solar facility "compatible" with another developer's concepts. (See Preface Figure 3). 	 <p>The Private Development of an 8MW Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA</p>  <p>PVNavigator, LLC Has Been Assembling a Portfolio of Environmentally Impacted Sites (esp. Closed Landfills) on Which to Develop MW-Utility-Scale PV Solar Power Installations.</p>
<p>4. The City Will Evaluate Proposals Vs Criteria which include Economic Considerations (Short & Long-term) and Community Acceptance and Benefits. (See RFP, p. 5, under Development Goals)</p>	<ul style="list-style-type: none"> Economic Considerations for the PV facility are: <ol style="list-style-type: none"> The City of West Covina and PVN enter into an exclusive LOI. The LOI allows PVN the ability to enter into a facility interconnect feasibility study with SCE (see the timeline in Figure 7) and commence power marketing and offtake negotiations, leading to a 20 year+, power purchase agreement with entities such as the City, SCE and a Community Solar Program (via for example SoCal's Clean Power Alliance). Upon successful interconnect and PPA results, PVN and the City enter into a 20 year lease, with an option for renew for successive 5 year periods. At time of writing, PVN forecasts a lease rate of ca. \$100K per year; but this fee is subject to adjustment after the PV systems' economics are better defined. Community Acceptance and Benefits are: <ol style="list-style-type: none"> A "low activity/minimal maintenance", no noise, out of line of site (top deck no visible from south side homes), solar facility has been mentioned in Community meetings and seemingly favored by Community organizations such as Livable West Covina and West Covina Improvement Association. Also, as Community solar programs grow in location and scale in cities in the Los Angeles basin, offering homeowners the ability to purchase renewable power, a BKK Class III landfill located, utility scale (3MW to 8MW solar installation) would be able to power 500 to 2,500 City of West Covina homes. See more at www.CleanPowerAlliance.org) 	 <p>Forecasted Project Timeline</p>

A Proposal to Develop an 8MWdc PV Solar Power Facility to be Located on the Top Deck of the BKK Class III Landfill I, West Covina, CA.

Keywords

Self-Financed, Privately Developed, 8MWdc PV Solar Power Installation at the BKK Class III landfill, West Covina, CA; 20 to 30 year Land Lease with City of West Covina, CA; Project Interconnect Study; SCE Interconnection; Multiple Power Sales Options (City Community Program, SCE); PVN's Similar Local Experience (e.g. our operational 3.1MW PV Installation at adjacent, Milliken Landfill, Ontario, CA); Development Permitting via DTSC & Cal Recycle; Local Labor during Procurement & Construction; Technical and Environmental Assessment/Due Diligence of BKK Class III Site Conditions has been Conducted; PVN Concept Study, Siting and Economic Analysis Already Performed

Preface Figures

For succinctness, ease of reading, and concept understanding, our Proposal flow starts with **Preface Figures 1 to 4**. The Preface Figures are formulated for review in a stand-alone fashion from the Proposal's text. We hope this will permit the multiple reviewers to gain an overall, time-efficient appreciation of our Proposal to develop a utility scale solar power project on the BKK Class III landfill's flat top deck.

In summary, the Preface Figures describe how PVNavigator, LLC will:

1. Approach the development of a PV solar installation atop the closed Class III cell of the BKK landfill,
2. Show the similarities between this proposed project and a project atop the Milliken Landfill in Ontario, CA,
3. Describe how we'll scale our project to match the needs of the City or other developers and finally,
4. Highlight other projects that we're working in the region.

Introduction

PVNavigator, LLC (PVN) is pleased to present our Proposal to the City of West Covina (the City) for the planning, permitting, design, financing, construction, and subsequent ownership and

operation of an 8MWdc Photovoltaic (PV) solar power project (the Project). The Project will be located on the capped, and suitably geotechnically stable², top deck on the closed BKK Class III Landfill in City of West Covina, CA.

The Project will interconnect with Southern California Edison (SCE) and begin providing renewable energy under a Power Purchase Agreement (PPA) by Q3, 2021. PVN has also defined multiple options for power sales.

The proposed Project is an ideal match for Brea-based PVN's capabilities and skillsets; that is, our singular focus is on the development of solar power projects on the caps of closed landfills. We also specialize in integrating our projects into the economic fabric of the host area. PVN's expertise is in redevelopment of unusable sites due to of environmental impacts in urban locations. **Preface Figure 4** shows some of the nearby locations where PVN is working on developing solar power projects on closed landfills.

2. Project Description for a PV Solar Development on the Top Deck of the BKK Class III Landfill

PVN proposes to plan, permit, design, finance, and construct an 8MWdc PV solar power project on the top deck of the closed BKK Class III Landfill in the City of West Covina, CA. The site is located at 2200 South Azusa Avenue, City of West Covina, CA. PVN is proposing to utilize a portion of parcel # 8735-002-018. **Figures 1 and 2** show a Preliminary PV Solar Design and a Facility Single Line Diagram, respectively.

The Project will interconnect with SCE's electricity grid at the onsite location shown in **Figure 3**. A formal Interconnection Feasibility Study will be performed with SCE during the project's planning stages to define the point of interconnection and the capacity within existing, local SCE power lines to accept the solar energy output. Given interconnect feasibility success, the project could begin providing renewable energy within the City, under a Power Purchase Agreement in just over two years. Other power sales options exist, such as via the LA Basin's Clean Power Alliance (www.CleanPowerAlliance.org) if the City were to join this organization.

The proposed BKK Project ideally suits PVN's capabilities and skillsets, where we lease and repurpose closed landfills for solar power, while at the same time, integrating our projects into

² Geotechnically suitable, that is, for the relatively low point loads and total load that the PV solar installation will impart to the 3.5 ft. thick, engineered landfill cover. The solar installation will also use self-ballasted racking, so that there will be no cap damage, cap penetration, or alteration to the landfill's storm water management features.

the economic fabric of the host area. Sites of suitable acreage (e.g. > 15 acres) which are in urban locations, adjacent to load, with cost-effective and technically feasible interconnect, are the focus of PVN's solar installation development activities.

Given the history of attempts to redevelop the acreage at the BKK site³, and the recent common knowledge of Singpoli 's plans for a large scale commercial development on both the Landfill and the Opportunity Site, we realize that the City will likely receive more economically attractive proposals for reuse of the landfill acreage. As such, and as described in **Preface Figure 3**, PVN is proposing a "scalable project" that may either stand-alone as an independent project or flexibly integrate into the plans of other development proposals. Our formal proposal is for a maximally sized 8MWdc solar project which would occupy all of the 50 acres on the landfill's top deck. However, consistent with our 3MW development on the Milliken Landfill in Ontario, we believe that an economically viable project can be formulated on acreage as low as 15 acres.

PVNavigator, LLC will own and operate the facility, selling power under a 20-30 year PPA⁴ to one of the numerous power offtakers in the Southern California region.

These include:

1. Southern California Edison, (SCE) continually releases RFPs seeking to procure renewable power. With a lease option agreement with the City in place, providing PVN the necessary site control required to propose a solar project to SCE. PVN would "bid in" a solar project in the range of 3 to 8MWdc to SCE power RFOs⁵ during the 2019/2020 timeframe.
2. Direct power sales to the City of West Covina. PVN would need to evaluate the City's power usage and match the project size to meet all or some portion of the City's municipal building electricity usage. PVN would offer a competitive and stabilized power rate to the City for the lifetime of the project.
3. Power sales to the Clean Power Alliance (CPA) (<https://cleanpoweralliance.org/>). PVN is very familiar with the process by which to bid solar projects into the CPA. The CPA releases an annual RFO in search of renewable energy projects located in LA County. The BKK project would match well with the CPA's power buying needs. The annual RFO window is in November of each year.

An alternate approach exists for the City to work more closely with the CPA, and institute a Community solar program. First, the City would need to join the CPA, resulting in residents having an option to receive their power from either SCE or from a renewable power source...which could be the BKK solar project.

³ As summarized in the RFP on pp 2 to 4.

⁴ **P**ower **P**urchase **A**greement (between PVN, LLC and the power buyer)

⁵ **R**equests **f**or **O**ffers

PVN is also experienced in bidding renewable energy projects into the Southern California Public Power Authority (<http://www.scppa.org/>)(SCPPA). SCPPA offers an annual RFO seeking renewable energy projects that is open for the entire year.

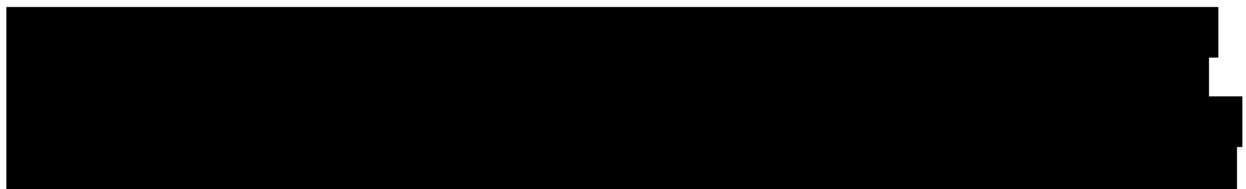
3. Developer's Experience:

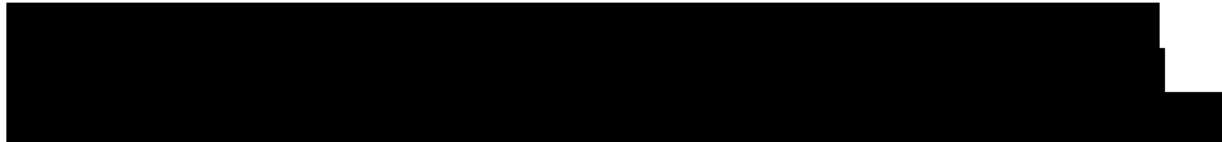
PVN is a utility-scale PV solar development firm whose sole focus is the development of projects on environmentally impacted sites such as landfills. A local, completed project which is currently online, is our 3MW PV installation at the County of San Bernardino's Milliken Landfill (Ontario, CA) (See **Preface Figure 2** and **Figure 4**). Examples of nearby PV development projects which PVN is also working on are mapped in **Preface Figure 4**. Of note, and close to the BKK site, is our ongoing work with Cal Poly Pomona on the retrofit of a 15 year old, tracking solar power installation, with modern day, high-wattage, PV modules (**See Figure 5**).

More on PVN's solar power development capabilities, experience, and project related information is described in the following links and Attachments:

- On our website at www.pvnavigatorllc.com
- In a presentation (**Attachment A**) at a Center for Creative Land Recycling (CCLR) seminar, and,
- At this [link](#) which describes the planning, design and construction of our 3.1MW (14 acre) PV installation on the Milliken Landfill, Ontario, CA.
- Our one page illustration (**Attachment B**) explains how the solar power development process works via initial scoping discussions with the site owner, followed by power offtake feasibility activities.

4. Pro Forma





5. Forecasted Development Project Timeline

The landfill's top deck solar project is expected to take approximately 20 months from being given the go ahead by the City until online power delivery.

A forecasted project timeline for a PV solar installation atop the BKK Class III landfill is shown in **Figure 6**.

More generally, with reference to **Figure 7** which shows the major development stages for a solar power project, the work phases for the BKK solar project would proceed as follows: The City of West Covina and PVNavigator, LLC enter into a lease-option agreement. During this option phase (approximately 6 months) PVN will create a 30% design (**Schedule ID 5**), and submit the project to SCE for an interconnection feasibility assessment (**Schedule ID 48**).

- In parallel with the above Task, seeking a long-term power purchase agreement (PPA), PVN will bid the solar project and it's offtake into a variety of RFOs from entities such as SCE, Clean Power Alliance, and SCAPPA. We will also assess the feasibility of delivering power behind the meter to the City or other entities such as BKK Corporation. (**Schedule IDs 31 to 37**)
- PVN will also seek project financing immediately when the lease option is executed. PVN has excellent relationships and contacts with a vast range of investors (with tax equity appetite) and lenders who, we know even at this early stage, would finance a BKK solar

⁶ Power Purchase Agreement (PPA), typically for a 20 to 30 year timeframe.

project. Our funding process would follow the same steps as we successfully pursued while financing our 3MW, Milliken Landfill solar project in 2017.

- On receipt of a favorable interconnection analysis by SCE, PVN will then work the project through all environmental approvals, especially with DTSC (**Schedule ID 40**) and any CEQA requirements (**Schedule ID 42**).
- After the above, simultaneously worked, varied project steps and approvals for interconnect, PPA, and permitting have been successfully achieved (say into Q4/Q3, 2020), PVN will then complete the system design (**Schedule ID 46**) and issue an RFP for Procurement (ID 50) and system Construction (**Schedule ID 52**).
- With PVNavigator managing all the above tasks in an integrated (but flexible) fashion, the proposed 3MW⁷ to 8MW can be operational by Q3, 2021.

Enclosures

Preface Figure 1	The Private Development of an 8MWdc Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA
Preface Figure 2	The BKK Class III Landfill Cap is Perfectly Suited for A Solar Installation: Geotechnically, Geographically, and is Free of Gas Monitoring Equipment
Preface Figure 3	PV Facility Can "Flexibly Integrate" with the More Traditional Plans of a Commercial BKK Site Developer or Stand Alone as an Independent Project.
Preface Figure 4	PVNavigator, LLC Has Been Assembling a Portfolio of Environmentally Impacted Sites (esp. Closed Landfills) on Which to Develop MW-Utility-Scale PV Solar Power Installations.
Preface Table 1	The City of West Covina's RFP Contains Certain Key Criteria, Especially as they apply to the Class III Landfill's Top Deck. They are Abstracted Here and Commented on Specific to a Proposed Top Deck Solar Power Development.
Figure 1	PV Solar Layout for the Proposed PV Solar Facility, Located atop the Closed BKK Class III Steel Landfill Site, City of West Covina, CA
Figure 2	Single Line Diagram for the Proposed PV Solar Facility, Located atop the Closed BKK Class III Steel Landfill Site, City of West Covina, CA

⁷ 3MW is mentioned as being a lower sized (capacity), and acreage (say 15 acres) PV installation which the City may deem to be more appropriate for integration into other commercial developers' plans.

Figure 3	Point of Interconnection for the Proposed PV Solar Facility, Located atop the Closed BKK Class III Steel Landfill Site, City of West Covina, CA
Figure 4	BKK Class III Landfill Proposed for Reuse at PVN's 8MW PV Installation.
Figure 5	PVN has been retained by Cal Poly Pomona to Retrofit the Outdated Amonix Solar Facility Located at the School's Sustainability Research Facility, the Lyle Center.
Figure 6	Forecasted Project Timeline
Figure 7	The Solar Power Development Process from a Landowner's Perspective
Attachment A	HelioScope Output for BKK Class III PV Project (Scope and Specifications Calculations)
Attachment B	PVN Presentation on the Development of Solar Power Installations on Closed Landfill Sites, Presented at Center for Creative Land Recycling Conference, Vista, CA, on May 23, 2017
Attachment C	PVNavigator, LLC Resumes

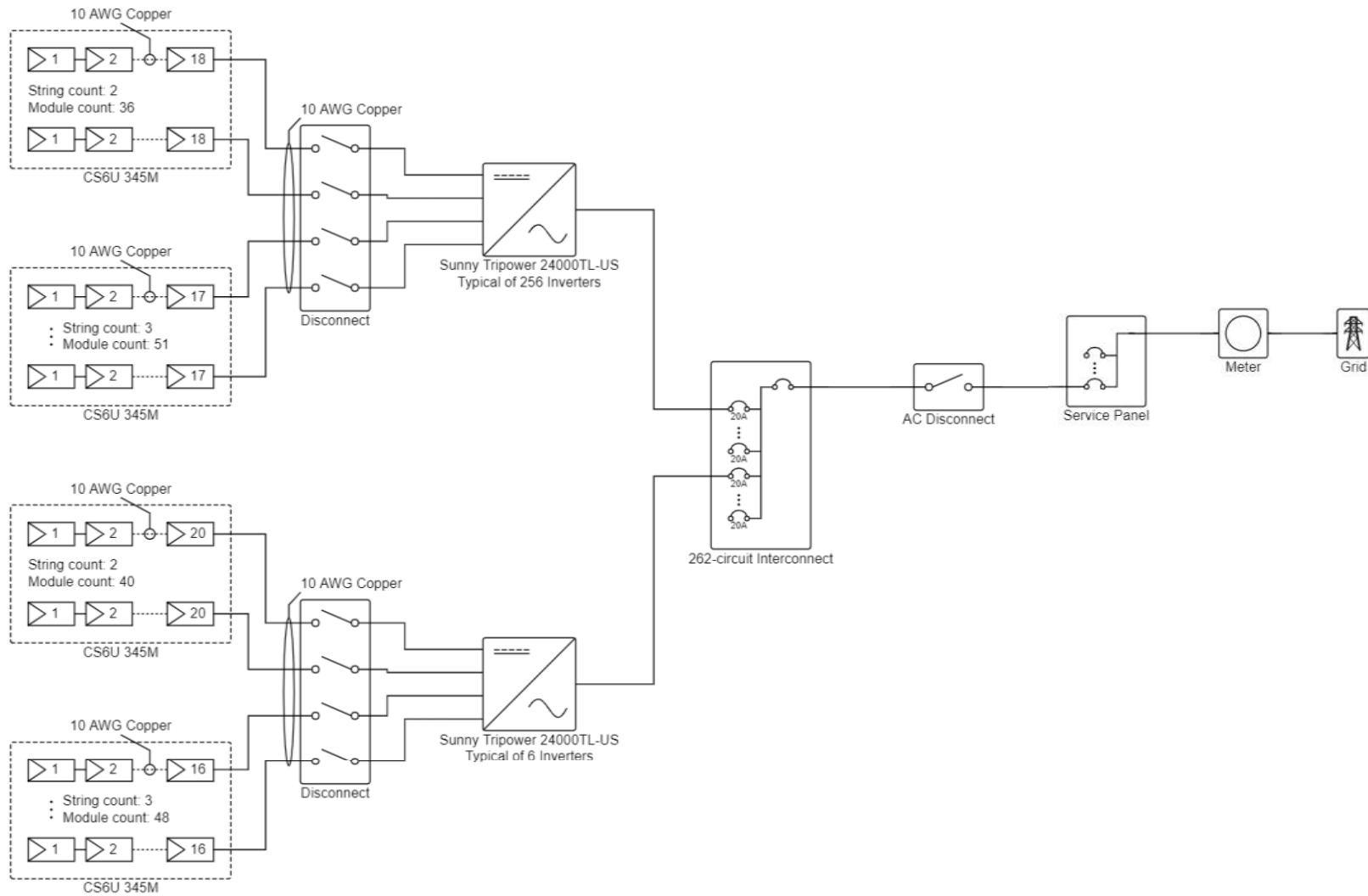
Figures

FIG
1

Preliminary Design Layout of an 8MWdc Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA



Single Line Diagram of an 8MWdc Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA



Module Specifications	
22800x Canadian Solar CS6U 345M	
STC Rating	345 W
Vmp	38.1 V
Imp	9.06 A
Voc	46.4 V
Isc	9.56 A

Inverter Specifications	
262x SMA Sunny Tripower 24000TL-US	
Max AC Power Rating	24.06 kW
Max Input Voltage	1,000 V

Wire Schedule		
Tier	Wire	Length
String	1310x 10 AWG	372300ft

Proposed Interconnection Point of an 8MWdc Photovoltaic (PV) Solar Power Installation on the Class III Cell of the BKK Landfill, City of West Covina, CA



Summary of PVNavigator, LLC's 3.1MWac PV Solar Development at the County of San Bernardino's Milliken Landfill, Ontario, CA



Who

- A development Team anchored by PVNavigator, LLC (PVN), Brea, CA
- PVN specializes in developing utility scale distributed solar facilities on closed landfill (brownfield) sites.
- All "pre-design" permitting, environmental and interconnect feasibility tasks performed by PVN.

What

- A 3.1MWac PV Solar Development.
- Fixed Tilt, Rack Mounted, Self Ballasting.
- Occupies 14 acres of landfill top deck areas.
- Racks are specifically designed for landfill cap installations.
- No long-term cap impacts.
- Power sales to SCE via a 25 year PPA

When

- All permitting and design completed by 2016.
- System installed and operational in 2017.

How

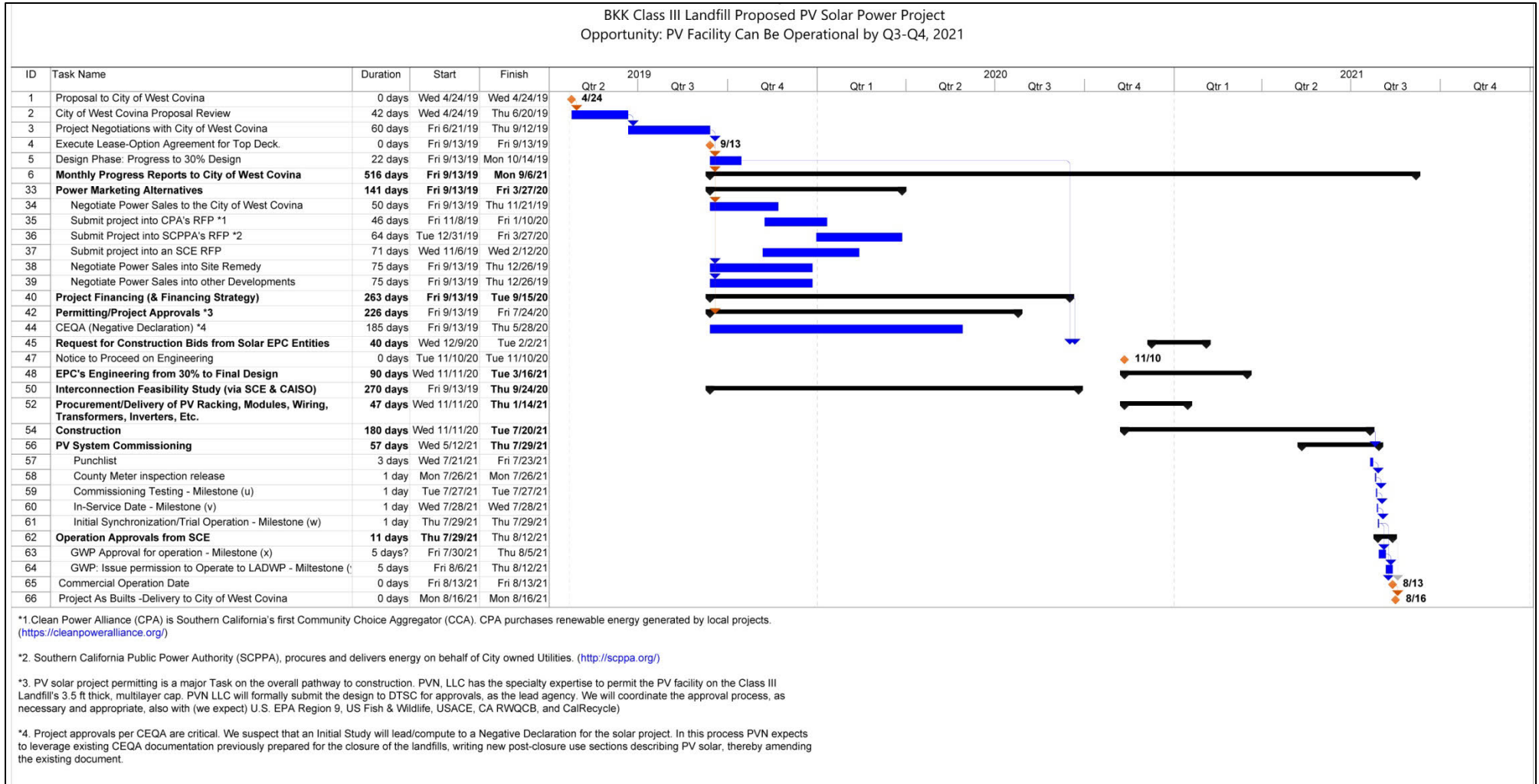
- PVN Milliken, LLC (project operating special purpose entity) and the County of San Bernardino entered into a Land Lease Agreement which includes ability to use the landfill top deck for 25 years.
- Project was financed via a combination of debt and equity.

FIG
5

PVN has been retained by Cal Poly Pomona to Retrofit the Outdated Amonix Solar Facility Located at the School's Sustainability Research Facility, the Lyle Center.

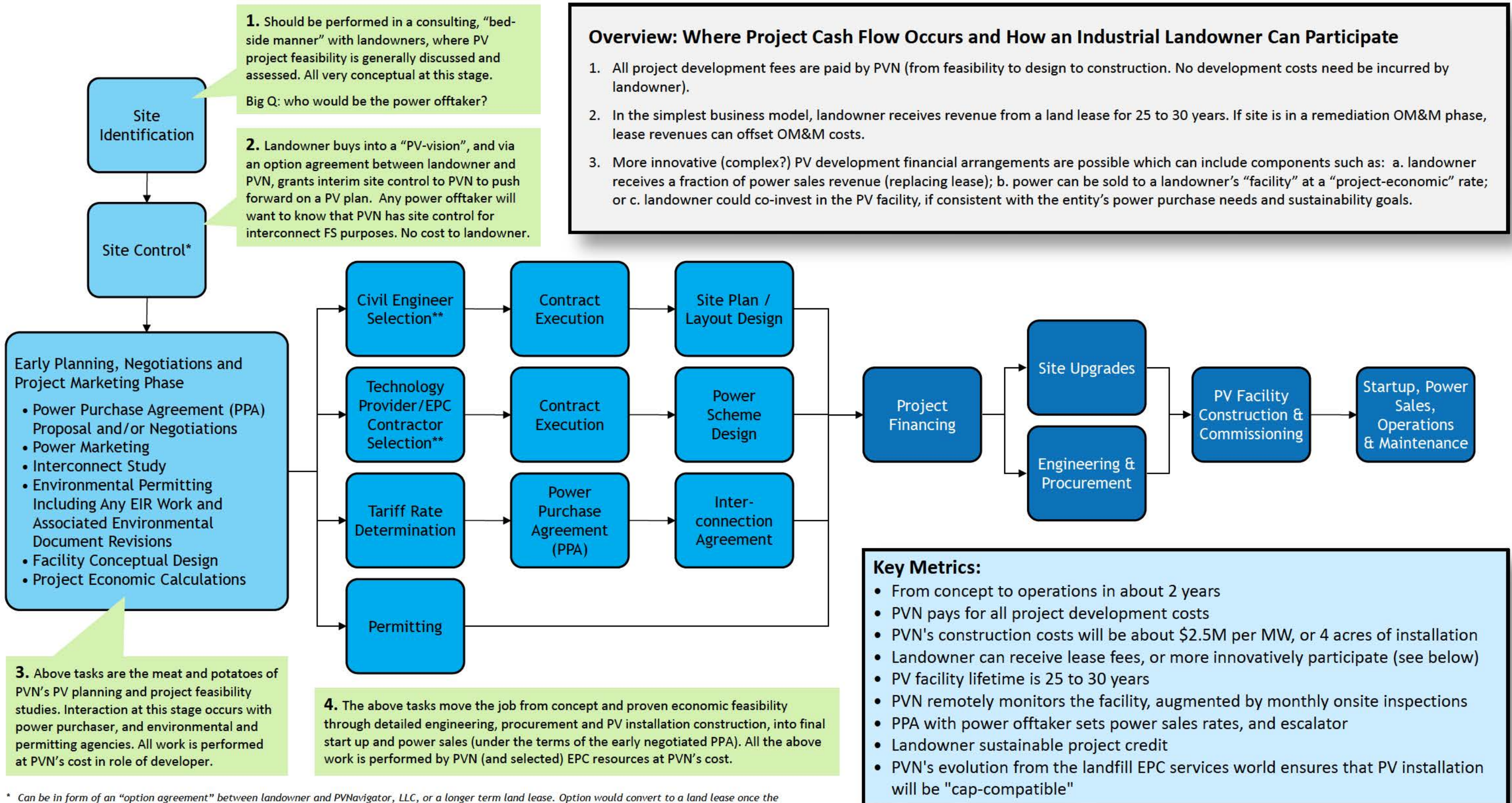


Forecasted Project Timeline for the Installation of a PV Solar Facility atop the Class III BKK Landfill



The Stages in PV Solar Power Installation Development: The Development Pathway as Viewed from a Landowners' Perspective

See Text Boxes 1 to 4, Below, for Commentary on the Development Pathway.



* Can be in form of an “option agreement” between landowner and PVNavigator, LLC, or a longer term land lease. Option would convert to a land lease once the scope and economics of the proposed project are better defined, such as at the execution of a PPA. PVN can supply a model option agreement, on request.

** Civil engineer and EPC contractor can be the one company.

Attachment A

HelioScope Output for BKK Class III PV Project (Scope and Specifications Calculations)

"West Covina" BKK Solar, 2210 S Azusa Ave, West Covina, CA 91792

Report

Project Name	BKK Solar
Project Address	2210 S Azusa Ave, West Covina, CA 91792
Prepared By	Robert WJ Fritz rfritz@projectnavigator.com



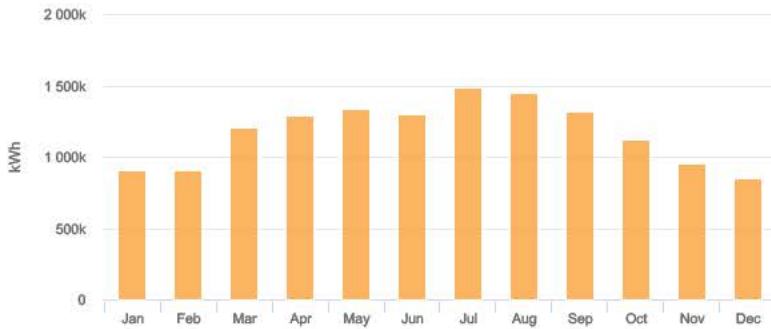
System Metrics

Design	"West Covina"
Module DC Nameplate	7.87 MW
Inverter AC Nameplate	6.30 MW Load Ratio: 1.25
Annual Production	14.16 GWh
Performance Ratio	82.0%
kWh/kWp	1,800.5
Weather Dataset	TMY, 10km grid (34.05,-117.95), NREL (prospector)
Simulator Version	d52726cb5f-05d8567105-d81d001426-1383410dd1

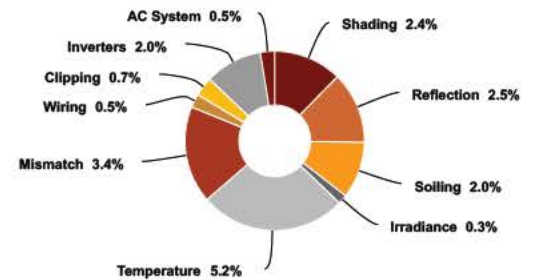
Project Location



Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m ²)	Annual Global Horizontal Irradiance	1,938.9	
	POA Irradiance	2,194.9	13.2%
	Shaded Irradiance	2,142.0	-2.4%
	Irradiance after Reflection	2,087.8	-2.5%
	Irradiance after Soiling	2,046.0	-2.0%
	Total Collector Irradiance	2,045.9	0.0%
Energy (kWh)	Nameplate	16,101,637.3	
	Output at Irradiance Levels	16,048,815.1	-0.3%
	Output at Cell Temperature Derate	15,218,104.6	-5.2%
	Output After Mismatch	14,696,879.5	-3.4%
	Optimal DC Output	14,627,034.2	-0.5%
	Constrained DC Output	14,527,950.1	-0.7%
	Inverter Output	14,233,600.0	-2.0%
	Energy to Grid	14,162,500.0	-0.5%
Temperature Metrics			
	Avg. Operating Ambient Temp		17.9 °C
	Avg. Operating Cell Temp		29.1 °C
Simulation Metrics			
	Operating Hours	4642	
	Solved Hours	4642	

Condition Set

Description	Condition Set 1											
Weather Dataset	TMY, 10km grid (34.05,-117.95), NREL (prospector)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type	a	b	Temperature Delta								
	Fixed Tilt	-3.56	-0.075	3°C								
	Flush Mount	-2.81	-0.0455	0°C								
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	2	2	2	2	2	2	2	2	2	2	2	2
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	0.50%											
Module Characterizations	Module	Characterization										
	CS6U 345M (Canadian Solar)	Spec Sheet Characterization, PAN										
Component Characterizations	Device	Characterization										
	Sunny Tripower 24000TL-US (SMA)	Modified CEC										

Components

Component	Name	Count
Inverters	Sunny Tripower 24000TL-US (SMA)	262 (6.30 MW)
Strings	10 AWG (Copper)	1,310 (372,300.2 ft)
Module	Canadian Solar, CS6U 345M (345W)	22,800 (7.87 MW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	5-20	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Portrait (Vertical)	22°	180°	8.0 ft	2x10	1,140	22,800	7.87 MW

Detailed Layout



Attachment B

PVNavigator, LLC Presentation at a Center for Creative Land
Recycling (CCLR) Conference,

Vista, CA, May 23, 2017

*Resources for Sustainable Redevelopment
and Land Recycling...the "Solar Power Tool"*

PVNAVIGATOR, LLC

Renewable Energy Development on Landfills and Brownfields

New Opportunities and Issues

Ian A. Webster, Sc.D.
Robert WJ Fritz, B.Sc.

Presentation at:

Center for Creative Land Recycling Workshop
Resources for Sustainable Redevelopment and
Land Recycling: Vista, CA

WEST COAST

1 Pointe Drive, Suite 320
Brea, CA 92821
714.388.1800

GULF COAST

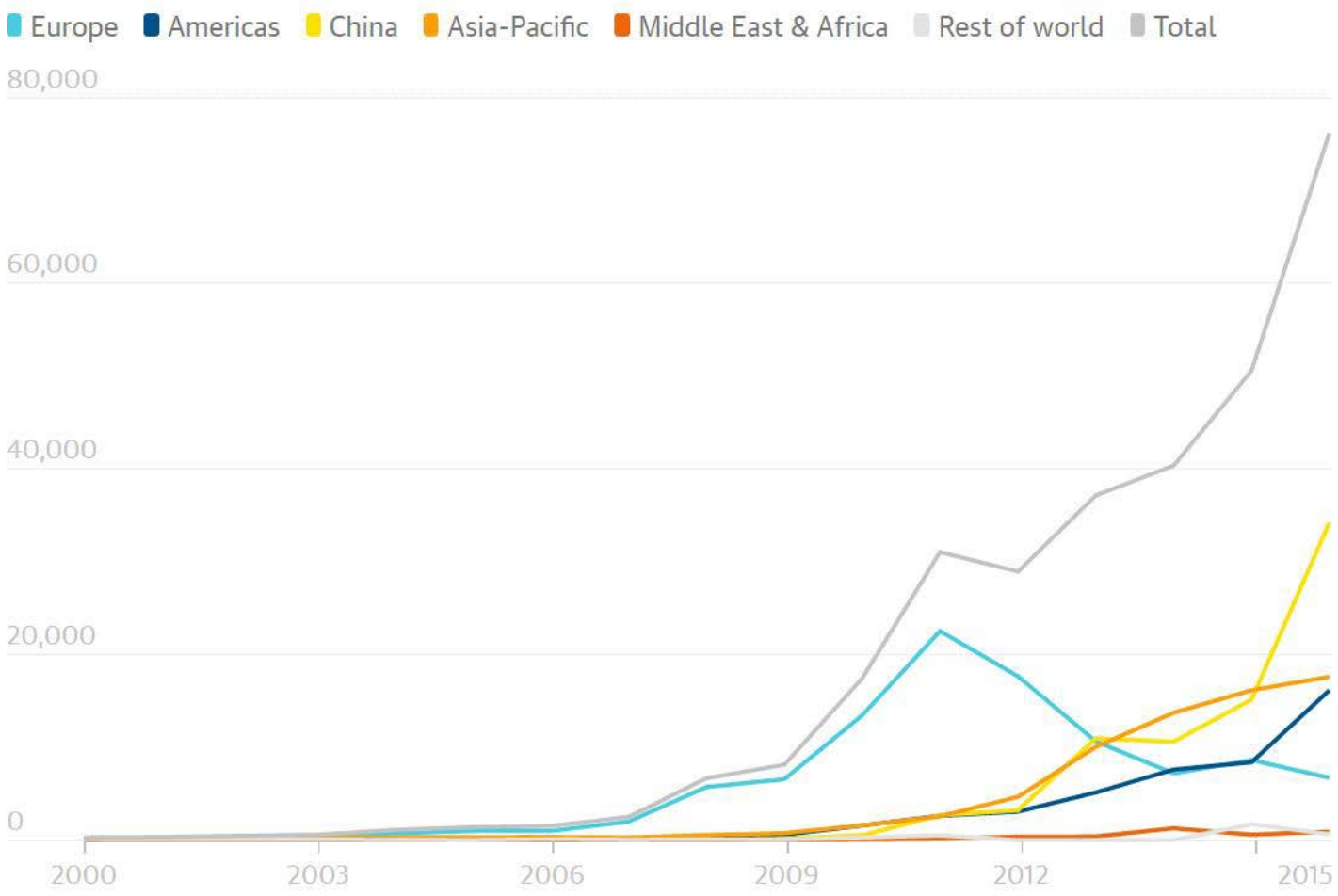
15990 N. Barkers Landing Rd., Suite 325
Houston, TX 77079
713.468.5004

PV NAVIGATOR LLC

www.PVNavigatorLLC.com

Grand Perspective: Renewable Power, While Still a Small Fraction of Carbon-Driven Power, is Here to Stay. For Example, New Solar Capacity Rose 50% in 2016.

China and the US led the growth in annual installed solar photovoltaic capacity (MW)



Source: SolarPower Europe

According to U.S. EPA, There Is No Shortage of Brownfield and Landfill Site Acreage Which Could Be Suitable for Renewable Energy



- Over 400,000 identified Brownfield sites in the United States
- 16 million acres are available for development of renewable energy
- That's enough land to generate approximately 3,175,000 MW
- (For reference, the Hoover Dam generates about 2,000 MW)

California Has 1,000's of Acres of Closed Landfill Space & Brownfield Sites. This Acreage Can Be Repurposed into MW-Scale Solar Power Installations.

From Worthless To Worthwhile

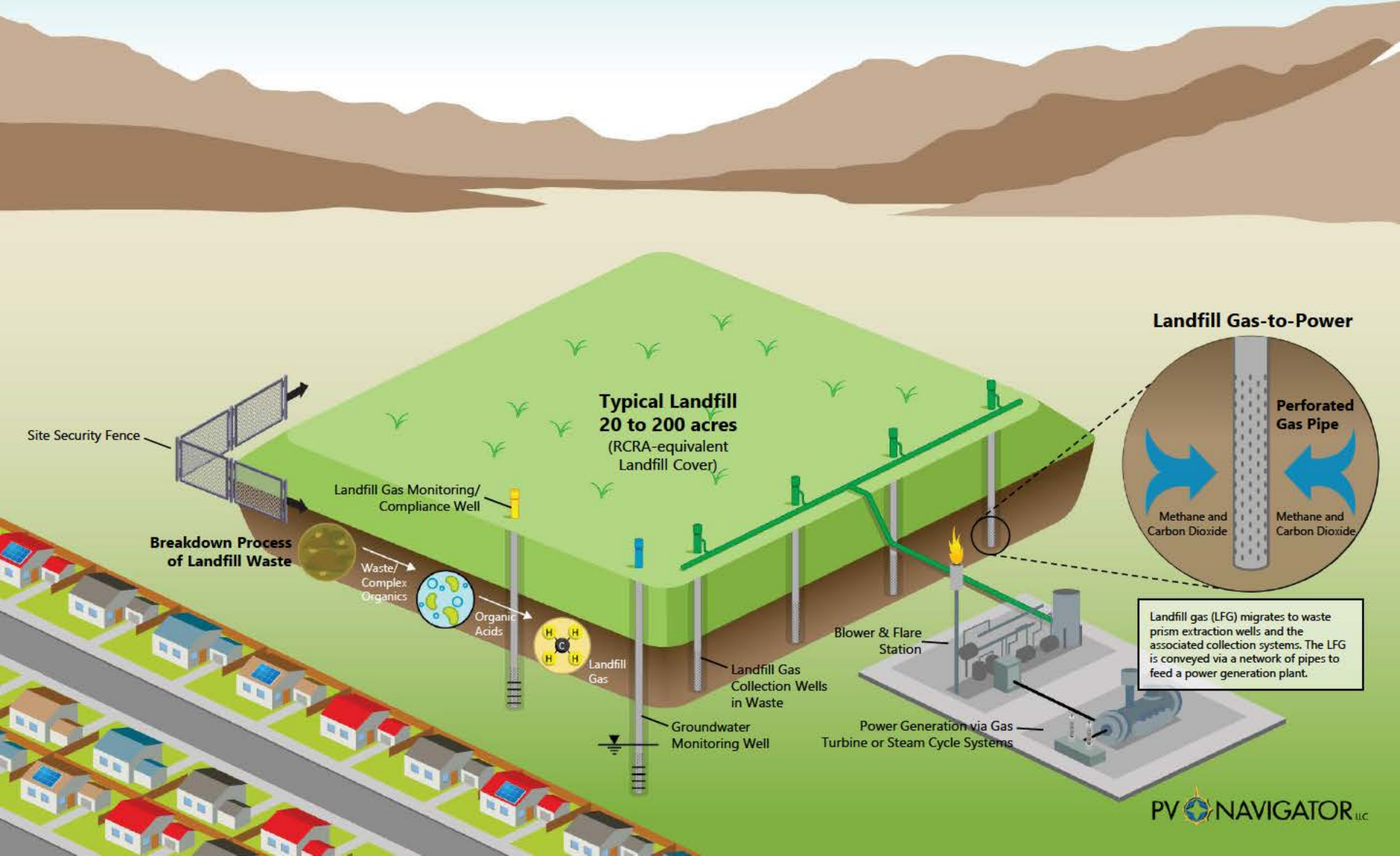
Our Niche: PV Solar Development on Landfill Caps

www.PVNavigatorLLC.com | Los Angeles • Houston

PV NAVIGATOR LLC

www.PVNavigatorLLC.com

Urban Located Landfill or Brownfield Sites Possess Significant Attributes for Repurposing into Renewable Power Installations....

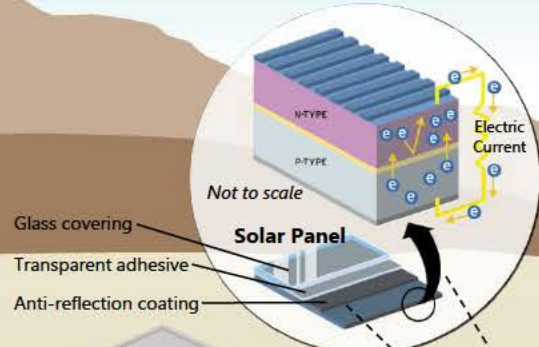


...Flat Acreage, Close to Load and Interconnect, Putting Otherwise Unusable Acreage Back to Use.

Projects are Technically Straightforward...but Administratively Complex.

The sun gives off about 400 trillion watts of power

Photovoltaic Cell Detailed cross-section



PV Solar Power

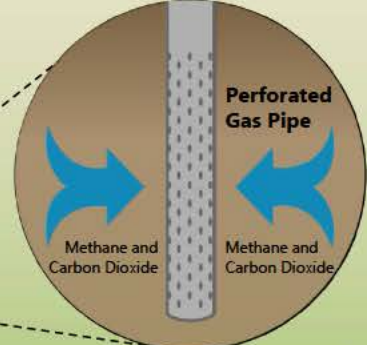
A photovoltaic (or PV) cell is a specially treated wafer of silicon, sandwiched between two thin contact plates. The top contact is positively charged and the back contact is negatively charged, making it a semiconductor.

- The n-type semiconductor has an abundance of electrons, giving it a negative charge, while the p-type semiconductor is positively charged.
- Electron movement at the p-n junction produces an electric field that allows only electrons to flow from the p-type layer to the n-type layer.
- When sunlight hits the solar cell, its energy knocks electrons loose from the atoms in the semiconductor.
- When the electrons hit the electrical field, they're shuttled to the top contact plate and become a usable electric current.
- PV panels are mounted in racking systems specially designed to accommodate landfill-specific requirements such as "no cap damage" and "waste settlement."

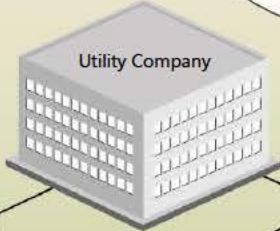


A typical racking module is 10 x 20 ft and generates 3.0 kW. This translates to about 1 MW from every 3-5 acres.

Landfill Gas-to-Power



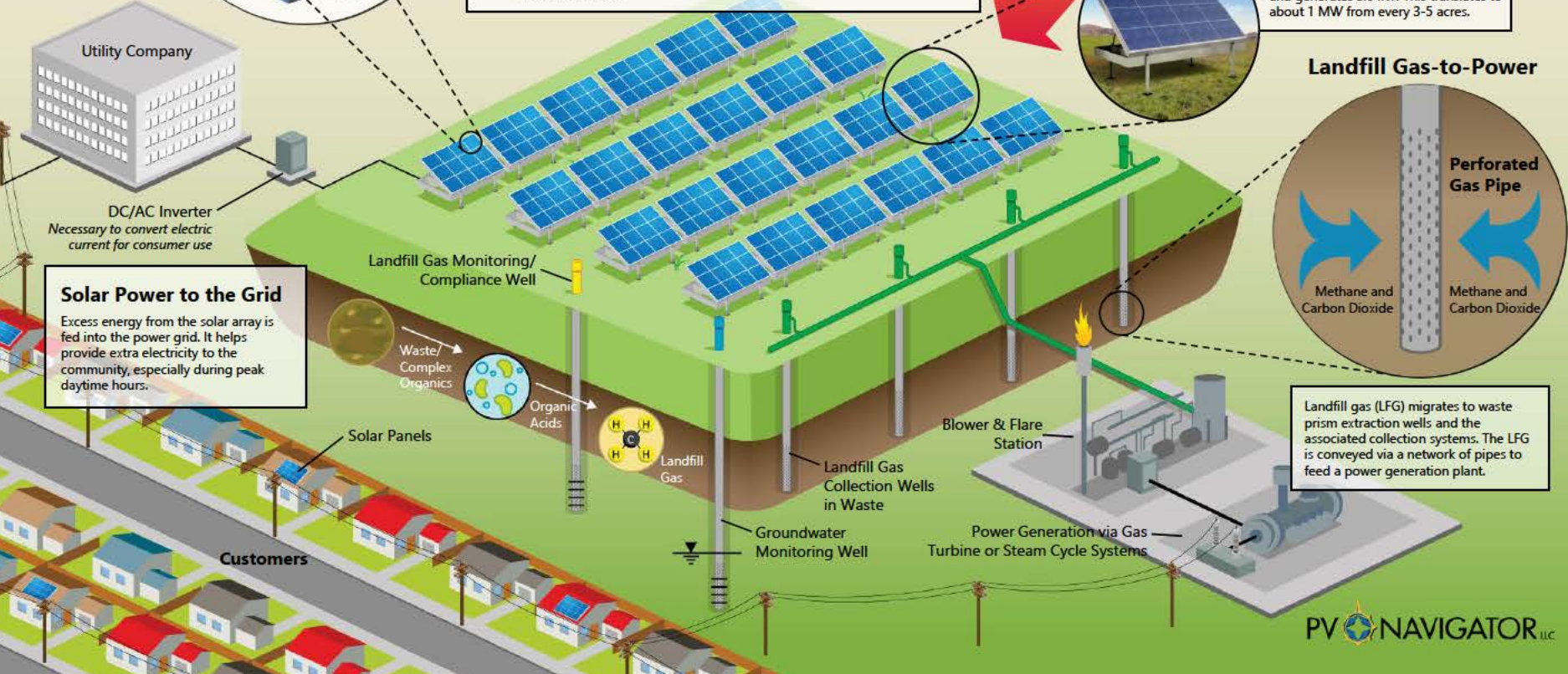
Landfill gas (LFG) migrates to waste prism extraction wells and the associated collection systems. The LFG is conveyed via a network of pipes to feed a power generation plant.



DC/AC Inverter
Necessary to convert electric current for consumer use

Solar Power to the Grid

Excess energy from the solar array is fed into the power grid. It helps provide extra electricity to the community, especially during peak daytime hours.



Cross-Section Figure a PV Solar Installation on an Engineered, Monitored Landfill Cap

Landfill Deck Located, PV Solar Installation
(Optimum if >10 Acres and <3% Slope)

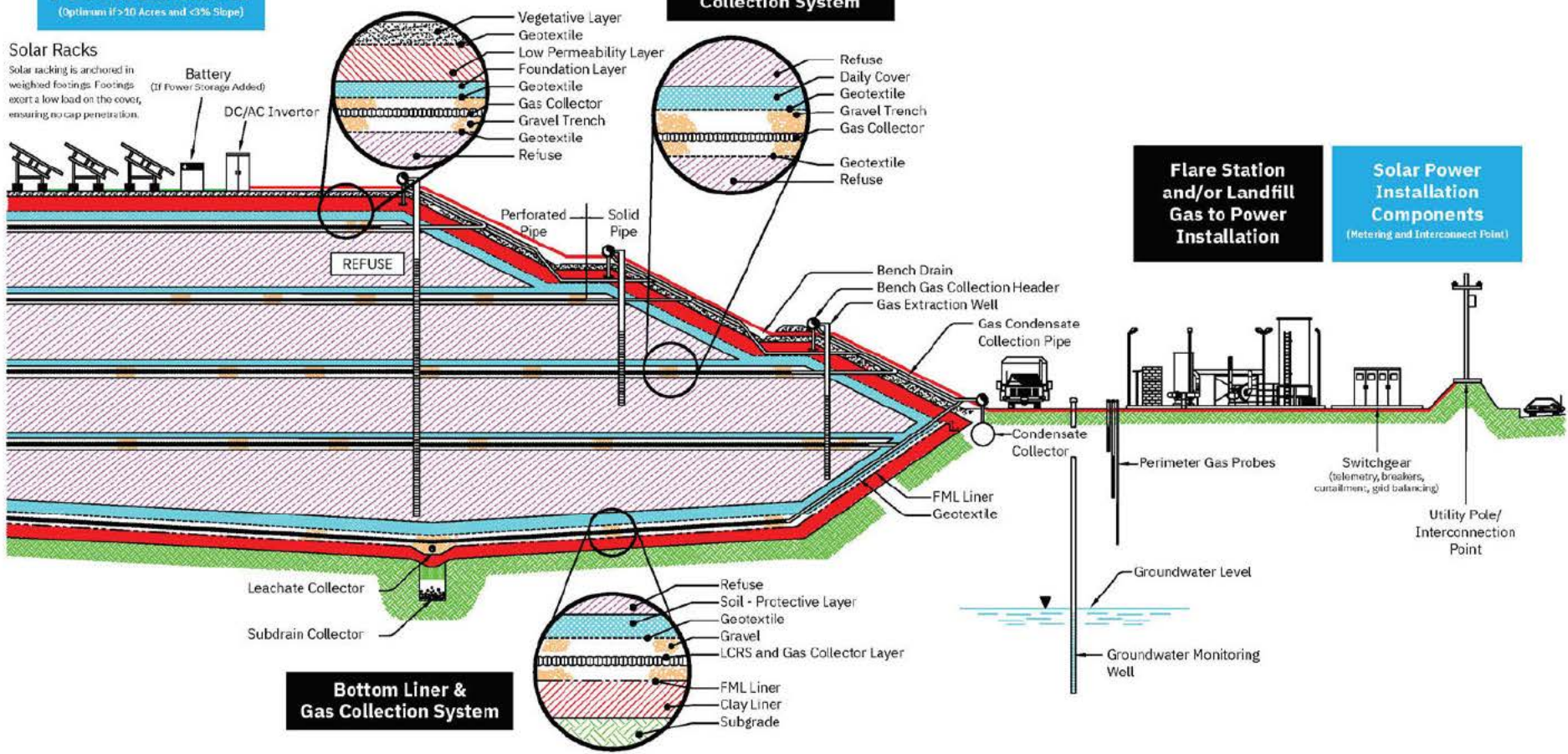
Solar Racks
Solar racking is anchored in weighted footings. Footings exert a low load on the cover, ensuring no cap penetration.

Battery (If Power Storage Added)
DC/AC Inverter

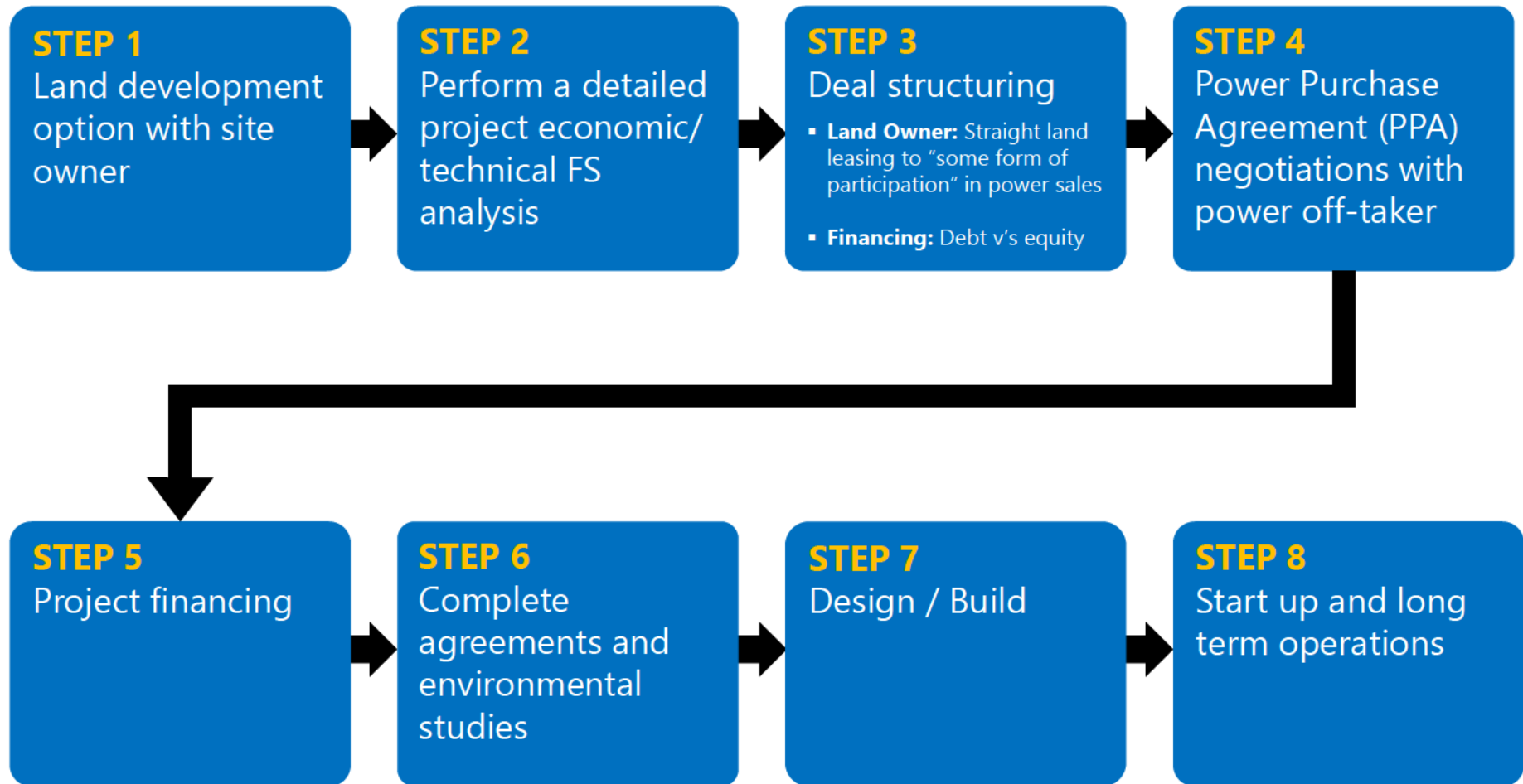
Horizontal Landfill Gas Collection System

Flare Station and/or Landfill Gas to Power Installation

Solar Power Installation Components
(Metering and Interconnect Point)



How to Do It: Development Logistics



Key Criteria for Siting Photovoltaic (PV) Solar Power Installations on Landfills and Brownfield Sites

Technical & Economic Feasibility for a Closed Landfill to Host a Renewable Solar Power Installation

Landfill Characteristics

- Engineered, closed "cap"
- Minimal settlement
- Landfill cell typically closed for > 10 years

Appropriate Geographic Location

- Urban location
- Priority here is access to I/C infrastructure (see Interconnection)

Project Economic Viability & Thereby, Project Financing Options

- Equity
- Debt

Adjacent Interconnection Point

- Best if < 1/4 Mile (~\$1MM/Mile)
- Existence of a LFG-to-electricity generator IC point is a bonus

Land Control Mechanism(s)

- e.g. Feasibility of a long-term lease (~30 yrs) or purchase
- Developer liability must be avoided

Ease of Project Permitting on a Closed Landfill Site

- With reference to restricted-use covenants
- Strategy: Formulate addendums to existing site closure docs

Consistency with Site Owner's (Green) Corporate Goals

- Sustainability criteria

Defined Power Offtake & Sales

- Adjacent/on-site load (private offtake exist?)
- PPA w/ utility via tariff
- Third party sales via PPA

State Mandated Renewable Portfolio Standards (RPS)

- Existence of Renewable Energy Credits
- Other incentives?
- Grants

Case Study: PVNavigator, LLC Took About 4 Years to Go from Concept to an Installed Solar Power Facility at the Milliken Landfill, Ontario, CA...

Key Facts

- Racking of 9,500 X 335W solar panels
- Ballasted ground mount; No cap penetration
- 6 X 500 kW inverters
- 6 X 500 kVA step-up transformers
- 12.5kV AC switchgear for metering and interconnect to SCE
- 50-60 construction personnel at peak times
- Forecasted operation by December, 2016
- System owned and operated by PVNavigator

...Deal Structuring and Permitting Took 10 Times Longer than Construction and Installation...



...A Total of 9,500 PV Modules Were Racked for the 3.1 MW Solar Power Installation...



...Which Is Operating Synergistically with the Landfill's Remedy.

Click [HERE](#) to learn more about the permitting and construction of PVN's 3.1 MW photovoltaic installation at the Milliken Sanitary Landfill in Ontario, CA.

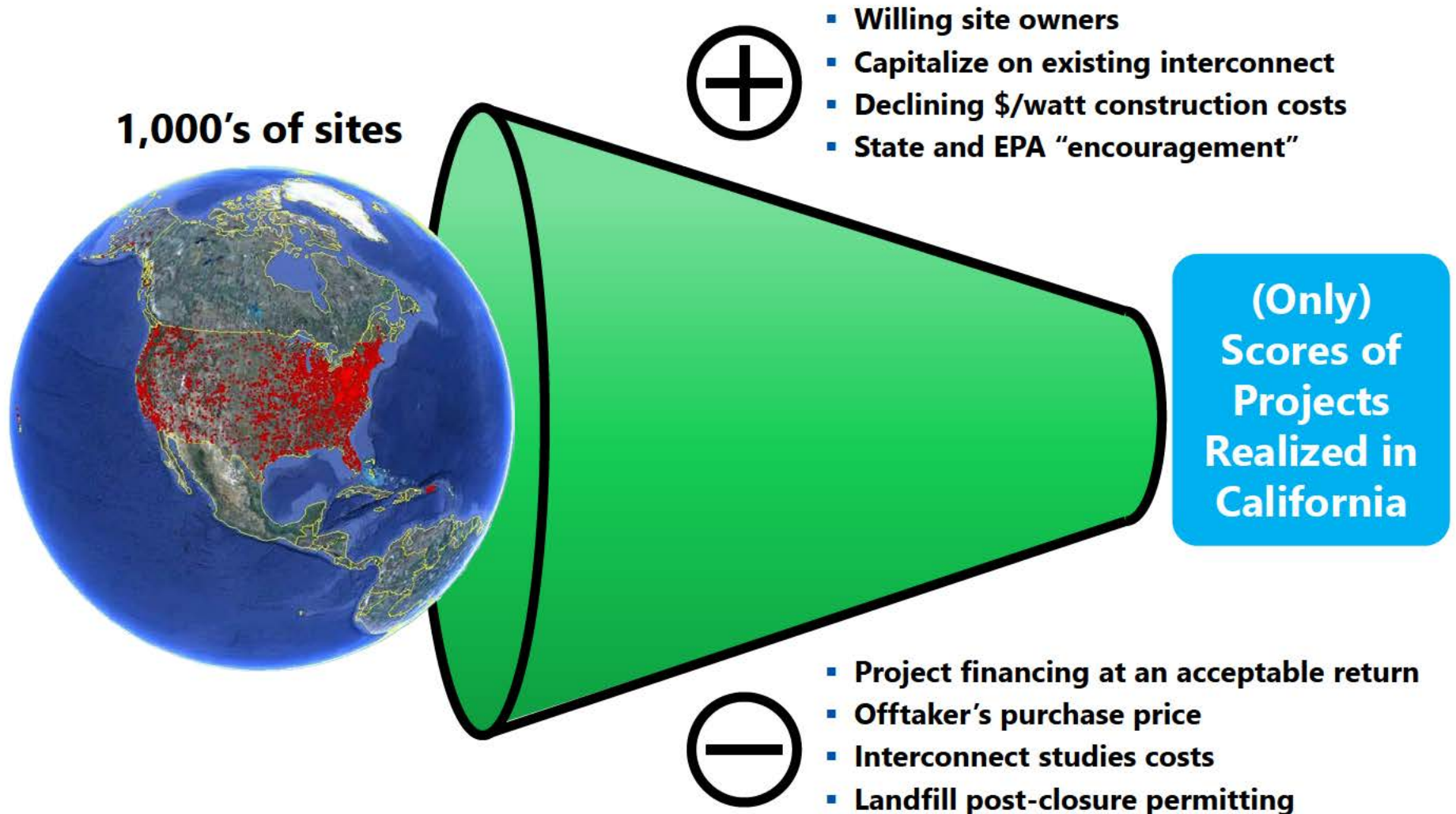


PVNavigator, LLC's 3MW Somerdale Road Landfill Solar Installation, Gloucester Township, NJ

Installation conceived and fully permitted via NJDEP and PSEG; Sold to Marina Energy (South Jersey Industries) at "shovel ready," for design, construction and operation.

TAKE-AWAYS:

2. Site Opportunities Are Plentiful



TAKE-AWAYS:

3. Multiple Skill Sets Required

SOLAR POWER EXPERTISE

*Electrical Engineering,
Project Cost Projections*

OPTIMAL TEAM

*Integrates all
3 capabilities*

LANDFILLS/CAPS AND SITE MANAGEMENT EXPERTISE

*Environmental
Engineering
Permitting
CEQA*

PROJECT FINANCING & LEGAL

*Deal Structuring
Contracts
Risk Mitigation*

Contact:



Ian Webster, Sc.D.
President & Founder
PVNavigator, LLC
T: 714.863.0483
E: iwebster@pvnavigatorllc.com



Robert WJ Fritz, B.Sc.
Project Manager
PVNavigator, LLC
T: 714.388.1813
E: rfritz@pvnavigatorllc.com

Attachment C

PVNavigator, LLC Resumes

Robert W.J. Fritz, B.Sc.



Robert WJ Fritz

Project Manager

USA & Canadian Citizen.

Remote "drone" Pilot

FAA (certificate # 4211631)

GIS Certificate, 2015

California State University of Los Angeles

B.Sc. Sustainable

Development, Env.

Geography/Science, 2012

Memorial University of Newfoundland

Focused Experience

- PV solar project development
 - Property acquisition
 - PPA negotiation
 - IC study process
 - EPC contractor selection, contract negotiation and management
 - Design/construction oversight
 - Project financing
 - Project pipeline mgmt
 - Preliminary project design
- Strategic business devlp & project management
- Marketing Strategies
- Technical reading and writing
- Data collection/Aerial photography
- Meeting facilitation
- Public speaking
- Community outreach

Skills

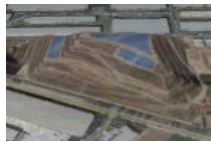
- Project feasibility study: economic and technical go/no-go
- PV Solar industry: up to date on technologies, policies, incentives, standards, offtake opportunities, site design, interconnection study processes
- PV solar project design: site layout, hardware selection, power generation modeling, single line diagram
- Pipeline tracking and management: currently managing, at various levels of development, more than 2 dozen projects at sites primarily in CA, TX, & NJ.
- Strong analytical skills and attention to detail.
- Reading, interpreting, writing, and communicating technical documents.
- Extensive training in numerous computer software and operating systems.
- Experienced in organizational and managing skills.

Representative Experience



Fontana Steel Residual Pit PV Solar Project

Overseeing all project development aspects including but not limited to: Preliminary design (layout, component selection, single line, generation simulation modeling); negotiations w/ landowner for signing of a LOI + ongoing negotiations for lease or purchase; Ongoing PPA negotiation via w/ a CCA and a Power Authority; Approval from SCE for Fast-Track interconnection study; CEQA: Lead Agency, in DTSC, as is included in the 2007 Remedial Action Plan, view solar as a favorable end-use for the site.



Milliken Landfill Solar Development, Ontario, CA

Assisted in selection of EPC contractor and served as the Owner's Representative to oversee all phases of construction. Collected daily data and created reports to keep team members updated.



Owens Corning Landfill Solar Development, Gloucester, NJ

Assisted in the creation and development in the following: a proposal, business plan, and negotiation of an option lease after which the Township took ownership of the site; Negotiation and securing of an Interconnect Agreement with PSE&G; a Wholesale Market Participation Agreement with PJM; and securing a SREC contract with PSE&G.

Employment History

2015 to present

PVNavigator, LLC, *Project Manager*

Provide logistic support to projects including scheduling, database management and mapping services for megawatt scale solar-on-landfill projects

2015 (Summer)

Burns and McDonnell, *GIS Intern*

Create production quality maps for delivery to clients. Namely large scale, sustainable power and utility services projects in California.

2015 (Jan-June)

Cal State LA, *Adjunct Instructor*

Taught undergraduate, introductory level geography courses, Physical and Cultural Geography

2014-2015

Cal State LA, *Graduate Assistant*

Maintain campus GIS lab, assist students with assignments and continue research projects for supervisory professor.

Peter J. DeFazio, MBA



Peter J. DeFazio, MBA
Senior Project Manager

Education

M.B.A., Finance
University of Portland

B.S. Mechanical Engineering
Gonzaga University

Focused Experience

- Strong quantitative and strategic skill set
- Corporate & business strategy
- Mergers and acquisitions
- Commercial execution
- Tax equity financing
- Debt financing
- Rating agency process
- Business development
- Finance modeling/management
- Team development/management
- Relationships
- Portfolio management
- Project management
- Solar power project siting and origination
- Power offtake alternatives, economics and negotiations

Focused Capabilities

- Renewable power, (esp. PV solar), commercial strategy development and execution through contract execution, financing, and financial/analytical modeling for M&A and Business Development
- Maintaining key relationships with banks, financial institutions, and tax equity providers to ensure valuation at the most competitive terms and oversee financing through financial close
- Evaluating, structuring and executing on debt financing and tax equity and fund structures for utility-scale wind and solar projects in the US
- Manage project due diligence process across various functional groups including engineering, O&M, asset management, interconnection, real estate, permitting and environmental, and insurance

Representative Experience

Corporate restructure and recapitalization (2016)

Chapter 11 restructuring of Blue Earth, Inc and capitalization of BrightMarkEnergy, LLC (formally Blue Earth, Inc).

JP Morgan Tax Equity Fund for Distributed Generation Assets (2015)

Execution of \$2.6 billion tax equity fund with JP Morgan Capital Corporation for distributed generation assets.

Edison Mission Energy 800 MW Wind Portfolio Tax Equity Financing (2015)

Execution of \$195 million portfolio tax equity financing with JP Morgan Capital Corporation in conjunction with NRG's \$750 million acquisition of the EME wind portfolio.

Broken Bow II 75 MW Wind (2014)

Private placement for wind farm resulting in \$80 million of debt proceeds. Led term sheet negotiations, and rating agency process, achieving investment grade credit rating.

Cameron 12 MTPA Liquefaction Project (2014)

Debt financing and Export Credit Agency-insured tranches for \$10 billion regasification & liquefaction LNG terminal in Louisiana, achieving \$7.4 billion in financing commitments from JBIC, NEXI and a group of 29 commercial banks. Led in rating agency process, achieving high credit ratings for senior secured debt ('A' equivalent).

Los Ramones Norte 1,340 MMcf/d Natural Gas Pipeline (2014)

Multi-tranche debt financing for \$1.4 billion natural gas pipeline in Mexico. Supported financing negotiations for fully underwritten deal (led by Pemex), achieving \$1.3 billion in financing proceeds, subsequent syndication to six development banks and seven commercial banks.

Copper Mountain 450+ MW Solar Complex 2, 3 (2013 - 2014)

Debt financings for solar projects in the U.S. aggregating \$750 million in financing proceeds. Led term sheet negotiations and credit documentation process with lenders and negotiated joint venture agreements with equity sponsors (ConEdison).

Employment History

2018 to present	Project Navigator, Ltd., Project Finance, Economics and Origination
2016 to 2018	TerraNavigator, LLC, CFO
Q4 2015 to 2016	Brightmark Energy, LLC Vice President, M&A and Project Finance
Q4 2014 to Q4 2015	NRG Energy, Sr. Manager, Commercial Execution
Q3 2011 to Q4 2014	Sempra Energy, Manager, Project Finance (Corporate), Manager, Structuring & Pricing (SDG&E)
Q1 2007 to Q3 2011	PacifiCorp Energy, Energy Market Trader, Ld/Sr. Financial Consultant
Q3 2006 to Q4 2006	Flintco Construction, Project Engineer



Mark Laska, Ph.D.
Principal

Ph.D. Ecology,
Rutgers University

M.S. Ecology,
Fordham University

Focused Experience

- Habitat Restoration
- Wetland Ecology
- Ecological Design & Planning
- Renewable Energy Planning
- Mitigation Banking
- Natural Resource Management
- Remediation strategy
- Regulatory negotiations
- Risk identification and management
- Remediation valuation
- Mergers & Acquisitions
- Design and construction oversight

Notable Projects

- Del Mar Fairgrounds South Overflow Parking Lot Ecological Planning And Restoration, Del Mar, CA, USA
- Moosa Creek Mitigation Bank, Strategic Ecological Planning, And Restoration Design, San Diego, CA, USA
- Croton Water Filtration Plant Constructed Wetlands Design, New York, NY, USA
- Gulf Coast Nrd/Restoration Planning – Expert Witness, Gulf Coast, USA

Skills

- Developing solutions to complex environmental issues
- Habitat Restoration
- Strategic site planning
- Redevelopment
- Management of multi-party, multi-agency projects
- Project scheduling, logistics and critical path analysis
- State and EPA regulatory negotiations
- Liability valuation to support corporate reserves
- Optimization of remediation strategy
- Construction and demolition management

Representative Experience

▪ **Valley Center Solar Facility Permitting Plan, San Diego, CA**

As Principal-in-Charge, Dr. Laska oversaw Great Ecology's work to prepare a permitting plan for a proposed solar photovoltaic site on 139 acres of land in San Diego, California. The intent of the permitting plan is to provide the detailed steps and potential cost estimates to receive all the necessary land use and environmental permits required to entitle the land for a solar development. Great Ecology prepared a preliminary initial study of the subject areas covered under the California Environmental Quality Act (CEQA) to identify opportunities and constraints for the project design and engineering process. Using this information, Great Ecology and the client consulted with the CEQA lead agency and land use permitting authority to identify the pathway to line of sight for the project. Great Ecology's permitting plan described the technical reports and other regulatory permits that are required to support a County-driven CEQA analysis for the site in line with the County's Guidelines for Determining Significance and Report Format and Content Requirements. Additionally, to garner support and streamline the permitting process, Great Ecology included a stakeholder engagement strategy as a component of the permitting plan.

▪ **Clean Power Solar, Lancaster, CA**

Overseen by Principal-in-Charge, Dr. Mark Laska, Great Ecology prepared a permitting plan for a proposed solar photovoltaic site (the Site) in Lancaster, California. Great Ecology garnered an initial understanding of the Site based on the Preliminary Systems Summary and a site visit with the Client and PV AMPS (the Team). Great Ecology conducted additional analysis to identify the complete set of regulatory constraints on the Site and opportunities to leverage resources from external sources to streamline the permitting process. With this information, Great Ecology drafted permitting plan with the steps necessary to achieve a Conditional Use Permit (CUP) for a ground-mounted utility scale solar photovoltaic facility at the Site. The ultimate goal is to provide the detailed permitting pathway to line of sight for the Project, including a list of the technical and regulatory work and associated costs to advance the Project to construction.

▪ **Sonoma Solar Facility Permitting Plan, Santa Rosa, CA**

Dr. Laska led Great Ecology's development of a solar facility permitting plan for a 55-acre site in Santa Rosa, CA. Contracted work included assessment of ecological site constraints, evaluation and planning for a Major Use Permit pathway, strategic cooperation with Sonoma County, and management of an integrated project team.

▪ **SOUTHERN CALIFORNIA MITIGATION EVALUATION, San Diego, CA**

Dr. Laska led Great Ecology's initial mitigation credit marketplace analysis to support informed investment decisions regarding the viability of establishing a mitigation bank in the San Diego region. Dr. Laska and staff identified existing mitigation banks, credit availability, and credit costs to evaluate the current market supply. Planned infrastructure and development projects as well as growth projections for the region informed potential mitigation bank sites and future market analysis. In addition, Great Ecology identified the priority habitat types for conservation, including aquatic resources such as marine eelgrass, vernal pools, tidal wetlands, upland streams, and riparian areas to inform potential mitigation areas. Great Ecology detailed guidelines next steps for further due diligence and marketplace analysis.

▪ **Lake San Marcos Biological Assessments & Restoration Evaluations, San Marcos, CA**

As the Principal-in-Charge, Dr. Laska oversees Great Ecology's biological investigations of Lake San Marcos, a nutrient-impaired water body in Southern California. Great Ecology is implementing an approved monitoring plan, which includes collecting water quality data, conducting bathymetry and sediment quality studies, and evaluating watershed hydrology and nutrient sources. In addition, Great Ecology is using various approaches to evaluate the phytoplankton community, fish populations, and the potential for toxic algal blooms. Data collected by Great ecology will be used to create a lake management strategy to address both water and nutrient-associated issues.

▪ **La Jolla Whale View Point Ecological Restoration Conceptual Plan, La Jolla, CA**

Dr. Laska oversaw Great Ecology's conceptual restoration plans for three key areas along the coast of La Jolla's Whale View Point Park. This effort was for the non-profit La Jolla Parks and Beaches (LJPB) explores on-site urban stormwater capture and management, coastal erosion, public access, and interpretive signage. Great Ecology prepared a suite of design alternatives, focusing on green infrastructure strategies, to be further developed with grant funding. Great Ecology also prepared a visually engaging marketing package for LJPB to generate interest in the project and solicit funding from private donors and public agencies.

Ian A. Webster, Sc.D.



Ian A. Webster

President, Senior Project Manager

Sc.D.
MIT, 1984

M.S.
Cornell University, 1979

B.Sc.
Strathclyde University, UK, 1976

All degrees in chemical engineering.

Focused Experience

- Remediation strategy development and planning
- Oversight at major remediation projects
- Risk based remediation planning
- Remediation at oil company projects from disposal sites to pipelines
- Sediments sites assessment and remediation
- Regulatory negotiations
- Risk management
- Remedial solutions
- Organizational structuring
- Cost avoidance strategies
- Optimizing pace to closure
- Data mining
- Allocation
- Site conceptual models
- Advocacy presentations
- Public agencies
- Cities & municipalities
- Meeting facilitation
- Resource utilization
- Design and construction oversight

Focused Capabilities

- Chemical/environmental engineer with 30 years of experience in most aspects of oilfield assessments and remediation. Performed at work at all types of oil facilities and installations, including active and abandoned pipelines.
- Project management with specialized capabilities and interests in data and information interpretation, modeling and visualization for the express purpose of improved client understanding and decision-making.

Skills

- Extensive understanding of oil driven (tank farm, refinery, oil field and pipeline) remediation projects and possible remedial approaches
- Remediation strategies and development of remedial options
- Management of complex environmental sites and programs
- Group management, and facilitation, leading towards decision-making and actions
- Site and situational assessment. Data confidence and data gap analysis
- Scenario and site conceptual model formulation
- Data mining and re-use via such techniques as GIS
- Project scheduling, logistics and critical path analysis
- Visual representation of complex technical concepts and scenarios
- Preparation of effective and audience accessible technical reports and presentations
- Project advocacy to agencies and public
- Resource selection, team building and management
- Relationships within the oil sector environmental world
- Project presentations in public forums

Representative Experience

Worked/working on site strategy development and implementation at complex assessment and remediation projects.



Independent Review Panel Manager, PG&E's Chromium 6 Groundwater Remediation Project, Hinkley, California Selected by the Hinkley Community, PG&E and Water Board to staff this ombudsman technical advisor position for the Community. In this role, advises community members about their technical concerns, comments on technical documents, and makes monthly presentations to the Community. Extensive details available at www.HinkleyGroundwater.com.



Honolulu Harbor State Superfund Site PNL has just been retained to assist the responsible parties plan the long-term future of the work. The 500 acre+ site by downtown Honolulu is criss-crossed by 100's of buried pipelines of varying ages and integrity.



MAR Services Site, Lafayette, Louisiana Devised and then implemented a remediation program for Exxon at this former oil field waste disposal facility. Managed the removal of all tanks, and associated pipelines. Negotiated with Dept of Natural Resources, then implemented, a "risk based 3 ft-only" remediation plan.



Operating Industries Inc. (OII) Superfund Site, Monterey Park, California President of New Cure, Inc., (NCI) from 1997 to 2000, and 2004 to 2006. NCI was established by the major PRPs to oversee and manage the extensive remediation programs at the Operating Industries Inc (OII) Superfund Site Landfill in Los Angeles. I was the "owners' representative" for a \$120MM construction phase where a landfill cap and gas collection pipeline system was installed.

Employment History

1997 to Present Project Navigator, Ltd.

Founder and President. Since founding PNL, I have worked to establish the firm as a respected team of problem solvers who focus on large, complex, regulatory impacted, remediation projects. I have created a company culture that strongly relies on the use of visual techniques to promote site conditions understanding, options development and, project problem solving with the client. Company has an excellent reputation within the oil business.

1984 to 1997 UNOCAL Corporation

Entered the company as a research engineer in the Brea, CA facility. Promoted into the Corporate Environmental Department in Los Angeles and from there into, what was formerly known as, Corporate Environmental Remediation and Technology. Focused on projects in California, and the Gulf Coast and for a time supported O&G new ventures on projects in Argentina and India. Resigned from Unocal with title of Chief Engineer, Superfund Projects in 1997 to establish Project Navigator.

Other

- Author of more than 35 peer reviewed technical papers
- Adjunct Professor of Chemical Engineering at University of Southern California
- Testified before Senate and House Committees on Superfund Issues
- Expert Witness Experience