Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-015_016
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SUPPLEMENTAL
WORKPAPERS TO

PREPARED DIRECT TESTIMONY

OF DANE A. WATSON

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

VOLUME 13

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

AUGUST 2022

SDG&E BESS Decommissioning

SDG&E
Battery Energy Storage System

Decommissioning Plans and Study

January 2022

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1. Executive Summary

The purpose of this document is to provide an overall plan and cost estimate for activities that will occur during the decommissioning phase of SDG&E Battery Energy Storage System (BESS) for the following projects:

- Borrego Microgrid 1 (Parker/Saft), 2100 Borrego Valley Road, Borrego Springs, CA 92004
- Borrego Microgrid 2 (ABB/Saft), 2100 Borrego Valley Road, Borrego Springs, CA 92004
- Escondido BESS, 571 Enterprise St, Escondido, CA 92029
- Eastern BESS, 904 W. Main St, El Cajon, CA 92020
- Top Gun Energy Storage, 6875 Consolidated Way, San Diego, CA 92121

Activities related to the restoration of land, the management of materials and waste will be considered in this document including:

- Permits, Certifications & Training
- Equipment Dismantling and Removal
- Removal and Recycling of the Battery Energy Storage Modules
- Removal of the Ancillary Electrical Systems
- Removal of Equipment Pads, Supports, Gravel and Perimeter Fence
- Site Restoration
- Environment Impacts

This plan is based on current best management practices and procedures. It will be updated as necessary based on new information and developments at the time of decommissioning.

A typical division of responsibility (DOR) for a BESS decommissioning project is provided in Appendix 1. Overall project schedule for completing the BESS decommissioning project is provided in Appendix 2. Overall project details for each ESS decommissioning project can be found in Appendix 3. Cost estimates for each BESS decommissioning project can be found in Appendix 4.

2. Project Details and Cost Estimating

The details required to plan and estimate a BESS Decommissioning Project are provided in Figure 1. In addition to these inputs the applicable local county codes and standards as well as state and federal regulations will need to be considered.

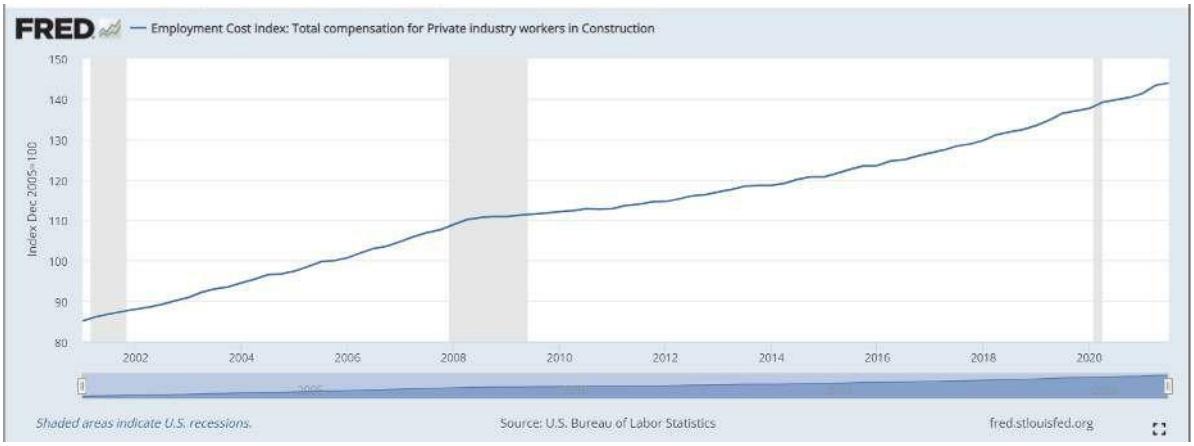
Figure 1 – Plan Detail Inputs

Input Data	
Battery	Battery Make/Model
	Battery Chemistry
	Battery module weight (lbs)
	Battery Module Length (in)
	Battery Module Width (in)
	Battery Module CATL Liquid Cooled?
	Number of battery racks per container
	Number of battery modules per rack
Enclosure	Number of battery enclosures (EOL)
	Estimated weight of battery enclosure without battery modules (lbs)
	Battery enclosures HVAC cooled (wall or roof mount)?
	Number of HVAC/Chiller Units per battery enclosure
	Clean agent fire suppression installed in enclosure?
Inverter/PCS	Are Inverters/PCS pad mounted?
	Number Inverters/PCS to be decommissioned
	Is isolation transformer integrated with PCS?
	Estimated weight of inverter/PCS (lbs)
	Inverter/PCS width (in)
	Inverter/PCS length (in)
	Are inverters/PCS liquid or air cooled?
Transformer	Number of isolation transfomers (pad mounted or integrated)
	Estimated weight of empty transformer (lbs)
	Are there oil filled transformers?
	Gallons of oil per transformer
Labor	Average Site Labor Cost ($/hr)
Logistics	Shipping distance from site to battery recycling facility (miles)
Schedule	Estimating Year
	Decommisioning Year
	Escalation (average ECI value since 2002)

The layout of the major equipment and access to the site are also important factors in determining final costs. These estimates assume there is adequate access to all sites and no obstructions need to be removed.

Labor cost estimate is based on a fully burdened rate for a qualified union electrician hired by a General Contractor. The rate assumes some overtime will applied during the decommissioning project.

Since these projects do not require a supply of new materials, the majority of the costs is due to the labor component. Therefore, the Employment Cost Index is used for price escalation. Using the following data one can determine the ECI for construction workers to be 2.5% on average for the last 20 years. For this study, the next 20 years will be assumed to follow a similar trend.



Source: U.S. Bureau of Labor Statistics **Release:** Employment Cost Index

Units: Index Dec 2005=100, Not Seasonally Adjusted

Frequency: Quarterly

Includes wages, salaries, and employer costs for employee benefits.

Suggested Citation:

U.S. Bureau of Labor Statistics, Employment Cost Index: Total compensation for Private industry workers in Construction [CIU2012300000000I], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CIU2012300000000I, November 15, 2021.

2.1. Battery Container

All of the systems in this study are composed of containerized batteries in various types of enclosures designs. All of the enclosure are assumed to be within standard shipping dimensions

2.2. Battery Pack

The fundamental unit of a battery pack is the battery cell, where potential electrical energy is stored as chemical energy. The battery pack cells wired in series. The battery cells utilize lithium-ion based chemistry. Each battery pack contains a battery pack controller, which collects voltage and temperature data from the battery cells and reports to the string controller. The battery pack controller is comprised of power supplies, power resisters, heat sinks and various other electronic circuits for controlling battery performance.

2.3. HVAC System

Battery container thermal management is provided by an HVAC system composed of one or more vertical wall-mounted air conditioning units. The HVAC units utilize R-410a refrigerant. Refrigerant 410A is not RCRA listed hazardous wastes but is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

2.4. Fire Suppression System

Fire suppression units are assumed to be a dry agent. The cannisters of dry agent will need to be removed and disposed of per manufacturer's instructions and applicable regulations

2.5. Power Conversion System

The PCS/Inverters vary in size and configuration for all projects in this study. The inverters may be skid mounted units installed on concrete foundations or housed in the battery containers. Some inverter types may use forced air cooing systems which utilize R449A refrigerant, or equivalent. Refrigerant R449A is not RCRA listed hazardous wastes but is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

2.6. Additional Equipment

Additional balance of plant equipment on site include oil-filled pad mount isolation transformers, control equipment enclosures, switchgear, dry-type transformers, and automatic transfer switches. At end of life, the transformers offer the potential for refurbishment and reuse, while the balance of equipment is electronic waste that will be managed appropriately.

3. Applicable Regulations, Certifications & Training

Decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and will be in accordance with applicable federal, state, and local permits.

3.1. Environmental Quality & US DOT Regulations

California Administrative Code adopts the US EPA Universal Waste rule in its entirety. Batteries in the decommissioned system destined for recycling are considered by the US EPA Resource Conservation and Recovery Act (Code of Federal Regulations, Title 40, Part 273) as Universal Waste.

The Project Owner will obtain an EPA ID number in advance of decommissioning the system as more than 5000 kg of universal waste will be accumulated (Code of Federal Regulations, 40 CFR 273.32).

Lithium-ion batteries are classified by the US Department of Transportation (DOT) as Class 9 hazardous materials. All requirements related to the packaging, labelling and transportation contained in the Code of Federal Regulations, Title 49, Subchapter C, Parts 171-180, will be followed.

3.2. Municipal Codes

The Projects reside in multiple counties in CA. Most have adopted the International Building Code with Amendments. Per the building code, a building permit must be obtained for any construction, alteration, repair, demolition, or change to the use or occupancy of a building. Accordingly, a building permit may be required prior to decommissioning of some sites. Notification of decommissioning to the AHJ/Fire Marshal may also be required during permit processing.

County ordinances regulating Stormwater Quality Management and the Discharge of Stormwater mandates post-construction stormwater measures and practices must be evaluated and planned for. A stormwater management permit may be required at project initiation to comply with the Ordinance. This permit requires the landowner to maintain any and all storm water measures and practices identified in the construction plan that were intended to remain in place after construction activities have been completed. It is not expected significant ground-disturbing activities will occur during decommissioning: therefore, a revised permit may not be required.

Because the decommissioning is expected to occur at a later date, the permitting requirements listed above will be reviewed and updated based on current local, state, and federal regulations at the time.

3.3. Certifications & Training

The handling of lithium-ion batteries will be performed by employees who have completed hazmat training applicable to their function (Code of Federal Regulations 49 CFR 172.704).

All workers who perform electrical work, including lockout/tagout and electrical disconnection, will be NFPA 70E electrical safety certified.

All hazardous wastes will be transported using appropriate waste manifests by certified waste carriers to a US EPA certified Treatment, Storage or Destination Facility.

4. Decommissioning Activities

At the time of decommissioning the installed equipment will be removed, repurposed, disposed of and recycled where possible. The facility will be restored to a state similar to its preconstruction condition. The removal of equipment and material will be done in accordance with the applicable regulations and manufacturer recommendations.

Prior to decommissioning, the facility will be deenergized and disconnected from the grid in coordination with all applicable parties. Generally, the decommissioning of the facility proceeds in reverse order of the original installation as follows.

4.1. State of charge at decommissioning

The battery energy storage system should be discharged to a state of charge as low as reasonably achievable. Although there is currently no restriction on the state of charge for ground transportation of lithium-ion batteries, the generally accepted practice is to reduce it as low as possible to minimize the hazard during handling and transport. If the batteries will be reused, follow manufacturer's instructions regarding depth of discharge to prevent cell damage.

4.2. System shutdown and disconnection

Before the system can be dismantled or removed, it will need to be shut down and disconnected from the utility system in accordance with the manufacturer's/integrator's procedures. This will include a final inspection of the system, system shut-down, and physical disconnection of the systems electrical components.

4.2.1. General Lockout/Tagout Procedures and Sequence

A general lockout/tagout (LOTO) sequence for isolating the BESS is provided below. Original Equipment Manufacturers provide equipment-specific LOTO procedures that will be used for equipment decommissioning. These LOTO procedures provide safe work processes and procedures compliant with OSHA standards 29 CFR 1910.147 and 29 CFR 1910.333 for the control of hazardous energy and the protection of employees working on electric circuits and equipment.

BESSMainsandDCPowerLOTO

Discharge battery modules to minimum SOC prior to starting LOTO.

Open and Lockout BESS Feeder Breaker to de-energize AC Mains to BESS Feeder

Maintain Aux Feeder Breaker closed to maintain HVAC/FSS systems operational until battery modules are removed.

Turn inverter OFF and open and lockout DC or AC input breakers.

Open and lockout DC disconnect in each battery enclosure to the associated to inverter.

Open and lockout AC breaker supplying power to battery switchgear inside of each the battery enclosure LV power distribution panel.

Remove DC battery string power cables (NOTE: Only Electrically qualified Electricians can perform this operation. This is an arc flash hazard requiring HRC3 or greater PPE).

Remove battery modules and package for shipment.

AuxiliaryPowerLOTO

Open and lockout Aux Feeder Breaker and any associated Load Break Switches

Disconnect and Remove 125VDC power batteries

Disconnect and remove UPS battery in Control Room

Disconnect and remove Fire Control Panel backup batteries in each battery enclosure

Turn off and disconnect backup generator

Disconnect and remove all power and control cables and prepare equipment for removal

12/12.47KVPowerLOTO

Open and lockout Substation BESS Main Feeder breaker.

Remove Utility supplied equipment and meters and connections

Remove MV switchgear and associated power and control cables

4.3. Battery removal

Battery modules will be removed from their racks and packaged as described below. Occupational Safety and Health Administration (OSHA) standards for safe lifting of heavy loads will be strictly followed. Multiple workers will be used as needed to safely remove the battery modules.

Lithium-ion batteries will be packaged in a manner to prevent short circuits, movement within the outer package, and accidental activation of the equipment.

The batteries will be palletized and packaged in accordance with the requirements of 49 CFR 173.24 and 173.24a. The packages containing the batteries will be marked and labelled in accordance with 49 CFR 173.185, Subparts D and E. Considerations for damaged batteries are provided in Section 7.0.

Battery recycling will be completed using a hydrometallurgical process. Large battery packs first go through a manual disassembly process where technicians will carefully dismantle the pack, separating assembly pieces and circuitry from the battery cells. The separated cells are then fed by conveyor to an automated crusher. This crusher, which operates under a liquid solution to prevent fugitive emissions and to reduce the reactivity of processed batteries, produces three types

of materials: metal solids, metal-enriched liquid, and plastic fluff. The metal solids and metal-enriched liquid contain materials that can all be used as raw materials in new products.

4.4. HVAC System

Refrigerant R410a is not RCRA listed hazardous wastes but is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling. The refrigerant will be removed by a certified technician who will ensure that the refrigerants are not exposed to atmosphere while decommissioning the chiller and safe disposal of refrigerants comply with EPA regulations 40 CFR part 82, Subpart F.

HVAC units will be removed from the containers per OEM procedures and sent to a metal recycler separately, or they will be sent with the container to an off-site metal recycler/reclamation facility.

4.5. Fire Suppression System

The fire suppression cannisters are generally units that may be connected via piping to centralized tanks or self contains . Typically fire suppression systems used FM200, Novec 1230, or Stat-X. For FM200 and Novec 1230 system cannisters are removed and sent back to qualified fire equipment installers for disposal/re-use.

Before disposing Stat-X canisters to landfill, they need to be processed to deactivate the materials. Per the Manufacturer the following methods shall be used to deactivate Stat-X canisters.

Note: Stat-X fixed aerosol fire suppression units are UN Class 1.4S devices (or Class 9 safety devices with US DOT special permit DOT-SP 20600) sealed in a stainless and insulated container of double wall tube construction. Orifice holes are hermetically sealed with a metalized polyester film.

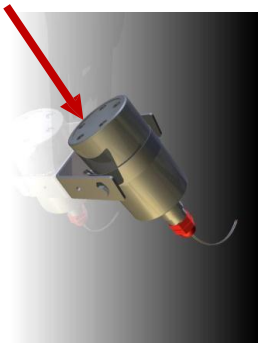
Stat-X aerosol forming molded pellet compounds are blended and pressed mixtures of dry potassium nitrate, dicyandiamide, and organic resin. These chemicals are more soluble in hot water than cold water, and dissolves most rapidly in boiling water (100°C/212°F). The electric initiator also includes a silicon capsule filled with crushed and ground aerosol forming compound. This mixture is also soluble in hot water.

The following steps must be performed to safely decommission Stat-X aerosol generators:

1. Prior to performing the following steps ensure that the generator flying leads are grounded together (copper leads are twisted together). **GENERATORS THAT ARE LIVE MUST HAVE INITIATOR LEADS KEPT AWAY FROM ANY LIVE ELECTRICAL SOURCES.** Subjecting leads to any electrical current or voltage source may cause the generator to discharge.

2. Safely place the generator in a securing device such as a belt or rubber grip table vice with the discharge ports pointed upward.

3. Using a Phillips tipped screwdriver or other such device puncture the membrane seal in each of the discharge ports as pictured below. Be sure each port is completely opened.



4. Fill a wateproof container such as a 5 gallon pail (or larger drum for 8” diameter generators) with hot or boiling or continuously heated water. Remove the generator from the securing device and submerge it in the water filled container. Allow water to enter the generator through the
open discharge ports.

   Repeat steps 1, 2 and 3 with other generators always placing them in the water filled container in horizontal or orifice facing upward. However, keep in mind that all generators must be fully submerged during the decommissioning process. Beware of scolding hot water and hot container.

5. Leave the generator(s) submerged in hot water for no less than 24 hours allowing the water to penetrate the generator and soak the internal components. During this process the water will dissolve the generator aerosol forming pellet compound. Drain and replace with fresh hot or boiling water as practical.

Warning: Always wear water proof gloves and eyewear protection when handling units in water solutions with dissolved chemicals. Avoid chemical solution contact with eyes or skin. Wash hands following operation.

6. Remove the now inert unit(s) from the water filled container.

7. Dispose of each unit and waste water by following local waste disposal regulations.

4.6. BESS Containers

All external additions such as stairs or railings will be removed and shipped separately as necessary to meet standard ISO container shipping dimensions. All loose components will be removed and anchoring will be removed to permit container to be lifted from the site. The container will be lifted by crane onto a flatbed or standard ISO container chassis for shipment to recycler/reclamation facility.

4.7. Power Conversion System

PCS units or portions of it can potentially be returned to the manufacturer or for secondary use in other projects. Alternatively, the PCS units will be sent to an R2-certified waste electronics salvage facility, where they will be able to remove the IGBTs and other power electronics for metal recovery. The R449A refrigerant in the PCS forced air cooling system will be removed by a certified technician who will ensure that the refrigerants are not exposed to atmosphere while decommissioning the chiller and safe disposal of refrigerants comply with EPA regulations 40 CFR part 82, Subpart F.

4.8. Transformers

Oil-filled transformers of this type typically have potential resale value, which will be pursued as the preferred outlet for this material. Should resale not be possible, transformer oil will be drained and sent to a waste oil processing facility for proper management. The transformer will be sent to a metal recycler or metal smelting facility for further processing and reclamation.

4.9. Additional Equipment

Control enclosures, automatic transfer switches, dry-type transformers and switchgear all considered electronic waste at end of life. Metal structures that can be easily separated will be sent to metal recyclers for reclamation. The balance of the electronic equipment will be sent to a certified R2-certified electronic waste recycler for proper management.

4.10. Electric Conductor Removal

Electrical conductors/wiring will be removed from above ground and underground locations. Underground conduit, pull boxes, trenches, and duct banks will be plugged/filled and abandoned in place. All electrical conductors removed will be recycled. All above grade conduits will be sent to metal recycler.

4.11. Fencing removal

Fencing material will be broken down into manageable units, removed from facility sent to an approved recycler. All posts driven into the ground will be pulled and removed.

4.12. Foundation Removal

Augured foundations and concreate slabs used as equipment pads will be broken and removed to grade. Clean concrete will be crushed and disposed of off-site and/or recycled and reused either on or off-site. Equipment foundations poured over existing pavement will be removed to existing pavement surface. Holes in existing pavement will be filled/patched.

5. Site Restoration Process Description

Following decommissioning activities, additional grade material will be applied. The affected areas will be inspected, thoroughly cleaned, and all construction-related debris removed. No reseeding of disturbed areas has been assumed.

6. Environmental Effects

Decommissioning activities have a similar risk of environmental impacts as those associated with construction phase. For example, decommissioning activities may result in the disturbance of soil, and erosion prevention measures will be put in place, so nearby watercourses or other natural features are not impacted. A Sediment and Erosion Control Plan, like that used during construction will be employed. The sediment and erosion control measures will remain in place until the site is stabilized to mitigate stormwater runoff and soil erosion. Temporary impact to roadway traffic similar to those during construction will accompany the decommissioning process. Noise levels similar to those during construction may be heard in the surrounding area while the decommissioning is taking place.

7. Damaged Batteries

Guidelines for safely handling batteries that have been subjected to abnormal conditions during installation or operation are provided below. In some cases, these abnormal conditions may require special care and specific packaging, storage and/or shipment requirements. Such abnormal conditions include:

1. Mechanical damage
2. Electrical damage
3. Thermal damage
4. Leaking electrolyte (resulting from either mechanical, electrical damage)

7.1. Mechanical Damage

Mechanical damage to battery modules can occur during handling and the damage may range from superficial scratches to more significant damage (e.g., dents, broken hardware, etc.). In severe cases, mechanical damage of the battery module resulting from severe shocks (e.g., dropping a battery module) can create a flaw in the cell that results in an internal cell fault much later (i.e., after the cell has undergone numerous cycles).

If mechanical damage is evident, or if the battery module is believed to have been subjected to severe shocks (i.e., dropped), take the following actions:

- Quarantine and monitor battery modules that have suffered mechanical damage. Mechanically damaged battery modules should be recycled rather than placed back into service.
- If the mechanical damage is severe, check for any signs of leaking electrolyte. If found, following the guidance provided in Section 7.4 below.
- Battery modules that have been mechanically damaged should be packaged and shipped per the guidance provided in Section 7.5 below.

7.2. Electrical Damage

Electrical damage may result from improper operation of the battery module, such as over-discharge, or may result from an internal or external short circuit. Over discharge may occur when the battery module has been fully discharged to the point that overall voltage is too low, or the voltage of individual batteries is much lower than its normal working voltage range. A short circuit could be caused by external means such as improper handling that permits results in the battery terminals shorting together, or from severe mechanical damage that results in an internal short between cells.

In the event of known or suspected electrical damage, take the following actions:

- If the battery module is in operation, shut off the relevant power source and electrical equipment. Shut off the connection between battery and system immediately.
- Quarantine and monitor battery modules that have suffered electrical damage. Electrically damaged battery modules should be recycled rather than placed back into service.
- Check for any signs of leaking electrolyte. If found, following the guidance provided in Section 7.4 below.

- Battery modules that have been electrically damaged should be packaged and shipped per the guidance provided in Section 7.5 below.

7.3. Thermal Damage

Thermal damage may occur due to a variety of conditions, including high internal temperatures that may result during operation that cannot be dissipated by the battery cooling system or high ambient temperature during storage that exceed manufacturer's recommendations.

7.3.1. High Internal Temperatures during Operation

Under normal circumstances, when the battery of the battery pack is over-temperature, the heat-removal system of the battery pack will automatically conduct the heat dissipation to make the battery pack cool down to the optimal working temperature range. When the battery pack cannot cool down to the target temperature within the specified time or the temperature of the battery pack exceeds the upper limit of safe use, notify OEM technical personnel to conduct a comprehensive inspection. If the evaluation determines that the excess temperatures may have damaged the battery module, it should be treated as a damaged battery and recycled following the guidance provided in Section 7.5 below.

7.3.2. High Ambient Temperatures during Storage

The battery manufacturer publishes specifications for proper storage of lithium-ion batteries, including ambient temperature ranges. Exceeding the ambient temperature specification can cause battery performance degradation. If it is believed that ambient storage temperatures exceeded manufacturer's specifications, notify OEM technical personnel to conduct an evaluation. If the evaluation determines that the excess temperatures may have damaged the battery module, it should be treated as a damaged battery and recycled following the guidance provided in Section 7.5 below.

7.4. Leaking Cells

The above sections provide recommendations on how to safely manage battery modules that have been subjected to mechanical, electrical, or thermal damage. Any of these scenarios could cause significant damage to the extent that permit electrolyte to leak from the battery cells. Should this occur, the following actions should be taken:

- Evacuate personnel from the area.

- If indoor, provide adequate ventilation until after the cell is removed from the area.
- If the cell vented because of excessive heating, it must be allowed to cool to ambient temperature before handling.
- Put on appropriate PPE including lab coat, rubber gloves, safety glasses and respirator.
- Place the battery in a container of sand or another chemically inert cushioning material like vermiculite
- Absorb and/or neutralize spilled electrolyte with an absorbent material or baking soda.
- Sweep contaminated baking soda or absorbent material into a sealable plastic bag for disposal.
- Clean the area with copious amounts of water or an ammonia- based cleaner.
- The resulting waste may be hazardous and subject to specific local, state, and federal hazardous waste disposal regulations.

7.5. Packaging for Shipment

This procedure is limited to batteries that remain classified as Universal Waste despite the damage, such as blunt force damage to battery module casing, loose parts, swollen cells, evidence of short circuit, etc. This procedure does not apply to damaged batteries with leaking cells. Such batteries must be shipped as a fully regulated hazardous waste.

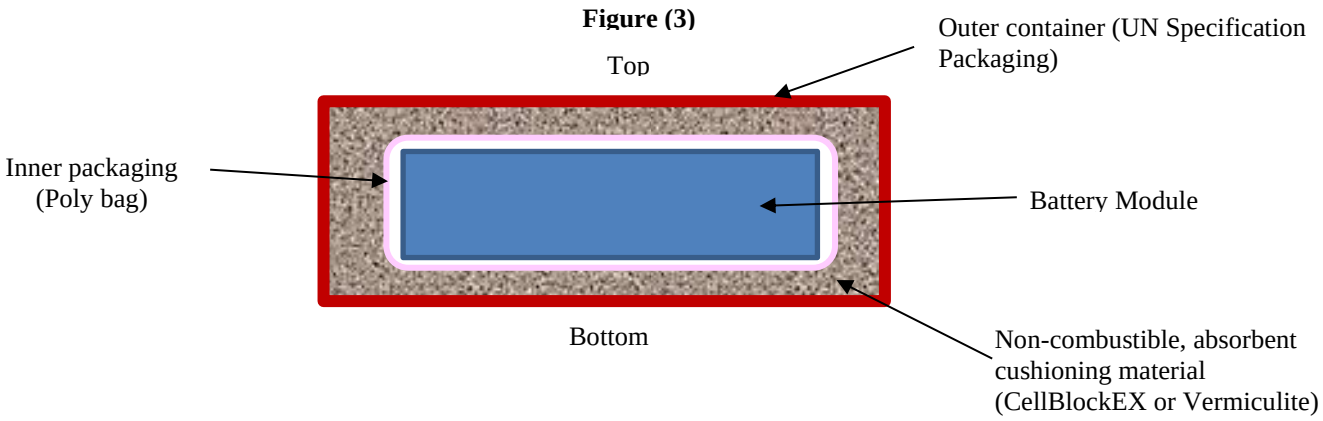
Before handling battery modules, the following requirements must be observed:

- Wear personal protective equipment including eye protection and nonconductive gloves
- Handle all damaged, defective, or recalled batteries with the same responsible care as a new battery to avoid any further damage.
- Do not drop batteries into the packaging or onto the shipping skid/pallet. Set them down carefully. Use lifting and handling fixtures as needed.
- If multiple damaged are being shipped, they may be palletized and stacked provided the overall weight does not exceed the capacity of the pallet.

7.5.1. Preparing Battery Modules for Shipment

- Damaged, defective, or recalled batteries must be placed in UN specification packaging, which is specially designed and tested packaging that has been demonstrated to withstand the forces typically expected to be encountered during shipment.
- Any battery module or cell that is damaged must be packaged individually. Multiple batteries in the same packaging are prohibited unless such packaging is accompanied by a Special Permit issued by the US DOT Pipeline & Hazardous Material Safety Administration (PHMSA).
- Battery module dimensions vary significantly by OEM and model. UN specification packaging must be procured that is suitable for the size and weight of the battery module to be shipped.
- The UN specification Packaging must be constructed of metal, plastic, or wood. Corrugated/fiberboard packaging is specifically prohibited.
- Terminals must be electrically insulated using electrical tape or other appropriate means.
- The battery module must be placed inside a non-metallic inner packaging that completely encloses the cell or battery. An anti-static plastic bag is suitable for this purpose.
- The battery module enclosed in the inner packaging must be placed inside the outer UN specification packaging and surrounded by cushioning material that is non-combustible, non-conductive, and absorbent (CellBlockEx or Vermiculite are suitable for this purpose). Refer to Figure 3 for a depiction of a properly prepared damaged battery.
- The battery modules should be set on the skid/pallet in the same orientation they were installed in the battery racks.

Figure (3)



7.5.2. Package Labeling & Marking

- Each container must have the correct labeling to meet DOT regulations prior to shipment. This is considered a Universal Waste shipment and must be marked as such.
- Affix DOT Class 9 and UN3480 on at least 2 sides.
- Affix a Universal Waste label or clearly write the words “UNIVERSAL WASTE BATTERY” on the package
- Label the package with the Consignor and Consignee Name and Address.
- Write “DAMAGED/DEFECTIVE LITHIUM-ION BATTERY” with black marker on at least one side.
- Do not overlap any markings or labels.
- Do not bend markings or labels around corners of packaging
- Do not put labels on the bottom of the package
- For shipments involving multiple damaged batteries, apply multiple layers of 75-gauge, clear stretch wrap around all four sides of the battery modules.
- Ensure all hazard markings, labels and UN Specification markings are clearly visible after shrink wrapping. If they are not visible, duplicate hazard markings and labels on the outside of the shrink wrap

7.5.3. Record Retention

A large quantity handler of universal waste must keep a record of each shipment of universal waste sent from the handler to other facilities. The record may take the form of a log, invoice, manifest, bill of lading, movement document or other shipping document. The record for each shipment of universal waste sent must include the following information:

(1) The name and address of the universal waste handler, destination facility, or foreign destination to whom the universal waste was sent.

(2) The quantity of each type of universal waste sent (e.g., batteries, pesticides, thermostats).

(3) The date the shipment of universal waste left the facility. A large quantity handler of universal waste must retain the records for at least three years from the date a shipment of universal waste left the facility.

A large quantity handler of universal waste must retain the records or at least three years from the date a shipment of universal waste left the facility.

APPENDIX 1
TYPICAL DIVISION OF RESPONSIBILITY

	Activity	SDGE	Equipment Logistics and Recycling	Site Labor and Decommissioning Contractor
1.0	**Project and Site Management**			
1	Overall Project Management		X	
2	Site Coordination/Site Management			X
3	Coordination Customer Internal Approvals	X		
4	Coordination with Independent System Operators/Utility Company	X		
5	Coordination with Geo-Tech Engineering if backfill/grading is required			X
6	Comply with existing Project Labor Agreements			
7	Payment of Fees including permits and Disposal of Equipment/Materials to Landfill	X (EPA)		X(Demolition, Landfill)
8	Provide existing site drawings, equipment manuals, equipment quantities, and bill of materials	X		
9	Provide material safety data sheets for all equipment/materials to be removed from site	X		
10	Provide and maintain insurance for all site related activities per Owner requirements		X	X
2.0	**Pre-Mobilization Planning**			
1	Obtain EPA Permit	X		
2	Obtain Demolition Permit			X
3	Obtain Environmental Permits (e.g. AQMD Approvals)	X		
4	Coordination and Notification of AHJs/Local Fire Authorities	X		
5	Develop and Submit Overall Site Safety Plans (JHA Procedure, Fall Protection, Hot Work, Hearing Protection, Heat Illness Protection, etc..)			X
6	Develop and Submit Emergency Response/Evacuation Plan			X
7	Develop and Submit Site Access/Security Plan			X
8	Develop Environmental Plans per Customer Specifications (Dust Mitigation, Storm Water Pollution Plan, Spill Prevention Plan, Audible Noise Plan, Wildlife Protection Plans,			X
9	Provide traffic and track-out control plan			X
10	Develop and Submit Laydown Area and Parking Plan			X
11	Provide equipment removal and dismantling procedures		X	
3.0	**Site Preparations and Mobilization**			
1	Provide Temporary Office Space (if required)			X
2	Provide Temporary Site Lighting (if required)			X
3	Provide and Connect Temporary Power Source			X
4	Provide Temporary Fencing (if required)			X
5	Provide Site Signage, Access Control, and Security			X
6	Provide Waste Management Equipment (Dumpsters, Oil Drums, Storage Bins)			X
7	Provide Portable Restrooms and Potable Water			X
8	Provide First Aid/Emergency Response Equipment (Eyewash Station,Fire Extinguishers, Spill			X
9	Perform Site Surveys to Locate Underground Utilities (Electrical/Gas/Water/Sewage) Prior to			X
10	Relocation of Existing Equipment/OverheadsTo Facilitate Access	X		
11	Ensure all battery modules have been discharged to minimum SOC	X		
12	Perform hazardous material samples and inspections (asbestos, lead, PCBs, mercury)		X	
13	Perform hazardous material abatements if required	X		
4.0	**System De-energization and LOTO**			
1	Develop AC Power De-energization/LOTO Plan with Utility Company at POC	X		
2	Develop Med (12K-34K) Voltage AC Power De-energization/LOTO Plan		X	X
3	Develop Site Low (120/240/480V) Voltage AC Power De-energization/LOTO Plan		X	X
4	Develop Site DC Power De-energization/LOTO Plan		X	X
5	Develop Turnover Plan	X		
6	Perfom MV De-Energization/LOTO Plan			X
7	Perfom LV De-Energization/LOTO Plan			X
8	Perform DC De-Energization/LOTO Plan			X
9	Complete System/Equipment Turnover to Dismantling Team	X		

APPENDIX 1 (Cont.)

	Activity	SDGE	Equipment Logistics and Recycling	Site Labor and Decommissioning Contractor
5.0	**Equipment Dismantling/Removal**			
1	Provide all Tools/PPE for Safe Dismantling/Removal of Equipment			X
2	Disconnect Low Voltage AC Power Cables at Terminals			X
3	Disconnect DC Power Cables Including Battery String Cables at Terminals			X
4	Sample and analyze Isolation Transformer Oil			X
5	Remove Isolation Transformer (s)			X
6	Prepare and Remove Pad Mounted Inverter (s)			X
7	Depressurize and Collect Battery Enclosure HVAC Refrigerant, if required		X	
8	Remove Battery Enclosure Fire Suppression Agent/Canisters, if required		X	
9	Remove battery modules from racks			X
10	Remove AC/DC Cables between Battery Enclosure and Transformer/Auxiliary Equipment up to high side of BESS main breaker			X
11	Remove Aux transformer and Aux Distribution Panels/Equipment			X
12	Remove BESS controls/SCADA			X
13	Remove MV switchgear			X
14	Remove UPS and recycle UPS batteries			X
15	Remove above ground cable trays			X
16	Remove steel platforms and support structures			X
17	Remove Utility supplied equipment (meters, RTAC, switches, transformers)	X		
18	Remove power and control connections Outside Fence line to Utility POC	X		
6.0	**Equipment Packaging and Loading**			
1	Package all equipment/materials for shipment per DOT standards			X
2	Ensure Proper Labeling of Equipment/Materials			X
3	Provide crane and/or forklift for equipment loading			X
7.0	**Equipment/Materials Transport**			
1	Coordinate pickup of battery modules		X	
2	Coordinate pickup of all equipment/materials to be disposed to landfill or recycled by local scrap metal company			X
3	Recycle damaged Battery Modules with unbreached cells (Universal Waste)		X	
4	Recycle damaged Battery Modules with breached cells (Hazardous Waste)		X	
5	Recycle/Scrap Battery Enclosure/Racks/HVAC		X	
6	Recycle/Scrap Inverter Enclosure/Power Electronics Inside Enclosure		X	
7	Recycle/Resell Isolation Transformer		X	
8	Recycle/Scrap Power and Control Cabling Outside Enclosure			X
9	Prepare Bill of Lading and Shipping Documents for respective shipments		X	
10	Load equipment/materials onto trucks for shipment			X
11	Provide 24/7 emergency contact coverage during transport and storage required by 49 CFR		X	
12	Ensure all equipment/materials have been delivered to recycler(s)		X	
13	Manage recordkeeping and certifications		X	
8.0	**Site Demolition/Cleanup**			
1	Inspection and Off Haul of Non -Contaminated Soils/Concrete			X
2	Inspection and Off Haul of Contaminated Soils (Not included)	X		
3	Removal of Equipment Foundations to grade or exisitng pavement			X
4	Removal of below grade material (Trenwa, Conduit, Manholes, Pull Boxes, Ground Grid Equipment, Concrete Encasements, Duct Banks) - NOT INCLUDED			NA
5	Supply Backfill for Restore Grade per Geo-Tech Engineering Requirements - NOT			NA
6	Remove and Dispose of Existing Site Fencing			X
7	Restoration of roadways to pre-Decommissioning conditions-NOT INCLUDED			NA
8	Ensure all permit inspections have been completed			X
9.0	**Demobilization/Project Closeout**			
1	Remove all temporary equipment from site			X
2	Submit completed final turnover document package to Owner			X

APPENDIX 2
Decommissioning Project Schedule-Borrego Microgrid 1

Decommissioning Plan and Sequence	Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Pre-Mobilization Planning	Develop De-energization plans with Customer, including PPE requirements							
	Develop equipment lifting and handling plan							
	Prepare materials needed at site (tools, pallets, packaging , labels)							
	Develop and approve site environmental and safety plans							
	Develop and approve security and site access plans (equipment access, gates, doors, staging area, parking)							
	Develop loading/pickup plans for batteries, scrap metal							
	Complete draft of BOL for hazardous materials							
	Obtain Utility agreement on de-energization plan and schedule							
	Complete site restoration and drainage plans							
	Obtain permits as needed							
	Physical obstacle to perform work have been removed.							
Mobilization	Setup site security and temporary facilities							
	Discuss site specific hazards and safety protocols							
	Perform job hazard assessments with Customer and perform work setup							
	Confirm laydown/temporary storage areas with Customer							
	Confirm emergency response procedures and contacts for fire or injury							
	Deliver metal scrap bins and packaging materials							
	Deliver forklift and handling equipment to site							
BESS AC Mains and DC Power LOTO	De-energize/LOTO AC side (mains) and DC power (Battery to Inverter) of Energy Storage System							
	De-energize/LOTO auxiliary power to battery switchgear							
	Set up limited approach boundry							
	Inspect and outfit in PPE. Minimum HRC3/PPE CAT 3 required during battery string power cable disconnects							
	Using insulated tools, remove battery module string power cables. (Note: After all string cables are removed PPE Cat 0 can be used.)							
Battery Module Removal and Shipment	Disconnect battery string power and communication cables							
	Remove Battery Modules and palletize for shipment							
	Ship battery modules to recycler							
Auxiliary Power LOTO	Disconnect and lockout Aux power supply from Medium Voltage Switchgear							
	Disconnect UPS and 125 VDC power							
	Disconnect Fire Control Panel backup batteries							
	Disconnect back up generator							
Utility Disconnect and LOTO	Disconnect and LOTO 12.47 KV power at Utility POC							
	Remove all utility company supplied meters,RTACs, CTs, SCADA equipment and ship to utility company							
Equipment Disassembly - Prep for Shipment	Drain and collect battery container AC refrigerant							
	Drain and collect inverter AC refrigerant							
	Remove and process Stat-X canisters for disposal							
	Remove control house AC refrigerant							
	Drain and collect transformer oil							
	Remove and package UPS/125 VDC lead acid batteries for shipment/recycling							
	Remove exterior hoods, steps, hold down bolts from battery enclosures							
	Disconnect and remove all power and control cables between equipment							
	Mobilize crane							
Loading and Shipment	Load battery containers onto trucks for shipment to recycler							
	Load Inverter and transformers onto truck for shipment							
	Load control enclosure							
	Load MV switchgear							
	De-mobilize crane							
	Ship scrap metal (cables, metal structures, panels) to recycler							
	Shipped drained oil to processing facility							
	Shipped lead acid batteries to recycler							
	Backfill and recompact							
	Remove and dispose of fencing							
	Final Patch and Grade per plan							
De-mobilization	Ensure all tools and equipment are removed.							
	Final site cleanup							
	Submit final reports and documentation							

APPENDIX 2, continued
Decommissioning Project Schedule-Borrego Microgrid 2

Decommissioning Plan and Sequence	Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Pre-Mobilization Planning	Develop De-energization plans with Customer, including PPE requirements							
	Develop equipment lifting and handling plan							
	Prepare materials needed at site (tools, pallets, packaging , labels)							
	Develop and approve site environmental and safety plans							
	Develop and approve security and site access plans (equipment access, gates, doors, staging area, parking)							
	Develop loading/pickup plans for batteries, scrap metal							
	Complete draft of BOL for hazardous materials							
	Obtain Utility agreement on de-energization plan and schedule							
	Complete site restoration and drainage plans							
	Obtain permits as needed							
	Physical obstacle to perform work have been removed.							
Mobilization	Setup site security and temporary facilities							
	Discuss site specific hazards and safety protocols							
	Perform job hazard assessments with Customer and perform work setup							
	Confirm laydown/temporary storage areas with Customer							
	Confirm emergency response procedures and contacts for fire or injury							
	Deliver metal scrap bins and packaging materials							
	Deliver forklift and handling equipment to site							
BESS AC Mains and DC Power LOTO	De-energize/LOTO AC side (mains) and DC power (Battery to Inverter) of Energy Storage System							
	De-energize/LOTO auxiliary power to battery switchgear							
	Set up limited approach boundry							
	Inspect and outfit in PPE. Minimum HRC3/PPE CAT 3 required during battery string power cable disconnects							
	Using insulated tools, remove battery module string power cables. (Note: After all string cables are removed PPE Cat 0 can be used.)							
Battery Module Removal and Shipment	Disconnect battery string power and communication cables							
	Remove Battery Modules and palletize for shipment							
	Ship battery modules to recycler							
Auxiliary Power LOTO	Disconnect and lockout Aux power supply from Medium Voltage Switchgear							
	Disconnect UPS and 125 VDC power							
	Disconnect Fire Control Panel backup batteries							
	Disconnect back up generator							
Utility Disconnect and LOTO	Disconnect and LOTO 12.47 KV power at Utility POC							
	Remove all utility company supplied meters,RTACs, CTs, SCADA equipment and ship to utility company							
Equipment Disassembly - Prep for Shipment	Drain and collect battery container AC refrigerant							
	Drain and collect inverter AC refrigerant							
	Remove and process Stat-X canisters for disposal							
	Remove control house AC refrigerant							
	Drain and collect transformer oil							
	Remove and package UPS/125 VDC lead acid batteries for shipment/recycling							
	Remove exterior hoods, steps, hold down bolts from battery enclosures							
	Disconnect and remove all power and control cables between equipment							
	Mobilize crane							
Loading and Shipment	Load battery containers onto trucks for shipment to recycler							
	Load Inverter and transformers onto truck for shipment							
	Load control enclosure							
	Load MV switchgear							
	De-mobilize crane							
	Ship scrap metal (cables, metal structures, panels) to recycler							
	Shipped drained oil to processing facility							
	Shipped lead acid batteries to recycler							
	Backfill and recompact							
	Remove and dispose of fencing							
	Final Patch and Grade per plan							
De-mobilization	Ensure all tools and equipment are removed.							
	Final site cleanup							
	Submit final reports and documentation							

APPENDIX 2, continued
Decommissioning Project Schedule-Top Gun Energy Storage

Decommissioning Plan and Sequence	Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Pre-Mobilization Planning	Develop De-energization plans with Customer, including PPE requirements															
	Develop equipment lifting and handling plan															
	Prepare materials needed at site (tools, pallets, packaging , labels)															
	Develop and approve site environmental and safety plans															
	Develop and approve security and site access plans (equipment access, gates, doors, staging area, parking)															
	Develop loading/pickup plans for batteries, scrap metal															
	Complete draft of BOL for hazardous materials															
	Obtain Utility agreement on de-energization plan and schedule															
	Complete site restoration and drainage plans															
	Obtain permits as needed															
	Physical obstacle to perform work have been removed.															
Mobilization	Setup site security and temporary facilities															
	Discuss site specific hazards and safety protocols															
	Perform job hazard assessments with Customer and perform work setup															
	Confirm laydown/temporary storage areas with Customer															
	Confirm emergency response procedures and contacts for fire or injury															
	Deliver metal scrap bins and packaging materials															
	Deliver forklift and handling equipment to site															
BESS AC Mains and DC Power LOTO	De-energize/LOTO AC side (mains) and DC power (Battery to Inverter) of Energy Storage System															
	De-energize/LOTO auxiliary power to battery switchgear															
	Set up limited approach boundry															
	Inspect and outfit in PPE. Minimum HRC3/PPE CAT 3 required during battery string power cable disconnects															
	Using insulated tools, remove battery module string power cables. (Note: After all string cables are removed PPE Cat 0 can be used.)															
Battery Module Removal and Shipment	Disconnect battery string power and communication cables															
	Remove Battery Modules and palletize for shipment															
	Ship battery modules to recycler															
Auxiliary Power LOTO	Disconnect and lockout Aux power supply from Medium Voltage Switchgear															
	Disconnect UPS and 125 VDC power															
	Disconnect Fire Control Panel backup batteries															
	Disconnect back up generator															
Utility Disconnect and LOTO	Disconnect and LOTO 12.47 KV power at Utility POC															
	Remove all utility company supplied meters,RTACs, CTs, SCADA equipment and ship to utility company															
Equipment Disassembly - Prep for Shipment	Drain and collect battery container AC refrigerant															
	Drain and collect inverter AC refrigerant															
	Remove and process fire suppression agent for disposal															
	Remove control house AC refrigerant															
	Drain and collect transformer oil															
	Remove and package UPS/125 VDC lead acid batteries for shipment/recycling															
	Remove exterior hoods, steps, hold down bolts from battery enclosures															
	Disconnect and remove all power and control cables between equipment															
	Mobilize crane															
Loading and Shipment	Load battery containers onto trucks for shipment to recycler															
	Load Inverter and/or transformers onto truck for shipment															
	Load control enclosure															
	Load MV switchgear															
	De-mobilize crane															
	Ship scrap metal (cables, metal structures, panels) to recycler															
	Shipped drained oil to processing facility															
	Shipped lead acid batteries to recycler															
Site Restoration	Backfill and recompact															
	Remove and dispose of fencing															
	Final Patch and Grade per plan															
De-mobilization	Ensure all tools and equipment are removed.															
	Final site cleanup															
	Submit final reports and documentation															

APPENDIX 2, continued
Decommissioning Project Schedule- Eastern BESS

Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Develop De-energization plans with Customer, including PPE requirements									
Develop equipment lifting and handling plan									
Prepare materials needed at site (tools, pallets, packaging , labels)									
Develop and approve site environmental and safety plans									
Develop and approve security and site access plans (equipment access, gates, doors, staging area, parking)									
Develop loading/pickup plans for batteries, scrap metal									
Complete draft of BOL for hazardous materials									
Obtain Utility agreement on de-energization plan and schedule									
Complete site restoration and drainage plans									
Obtain permits as needed									
Physical obstacle to perform work have been removed.									
Setup site security and temporary facilities									
Discuss site specific hazards and safety protocols									
Perform job hazard assessments with Customer and perform work setup									
Confirm laydown/temporary storage areas with Customer									
Confirm emergency response procedures and contacts for fire or injury									
Deliver metal scrap bins and packaging materials									
Deliver forklift and handling equipment to site									
De-energize/LOTO AC side (mains) and DC power (Battery to Inverter) of Energy Storage System									
De-energize/LOTO auxiliary power to battery switchgear									
Set up limited approach boundry									
Inspect and outfit in PPE. Minimum HRC3/PPE CAT 3 required during battery string power cable disconnects									
Using insulated tools, remove battery module string power cables. (Note: After all string cables are removed PPE Cat 0 can be used.)									
Disconnect battery string power and communication cables									
Remove Battery Modules and palletize for shipment									
Ship battery modules to recycler									
Disconnect and lockout Aux power supply from Medium Voltage Switchgear									
Disconnect UPS and 125 VDC power									
Disconnect Fire Control Panel backup batteries									
Disconnect back up generator									
Disconnect and LOTO 12.47 KV power at Utility POC									
Remove all utility company supplied meters,RTACs, CTs, SCADA equipment and ship to utility company									
Drain and collect battery container AC refrigerant									
Drain and collect inverter AC refrigerant									
Remove and process fire suppression agent for disposal									
Remove control house AC refrigerant									
Drain and collect transformer oil									
Remove and package UPS/125 VDC lead acid batteries for shipment/recycling									
Remove exterior hoods, steps, hold down bolts from battery enclosures									
Disconnect and remove all power and control cables between equipment									
Mobilize crane									
Load battery containers onto trucks for shipment to recycler									
Load Inverter and/or transformers onto truck for shipment									
Load control enclosure									
Load MV switchgear									
De-mobilize crane									
Ship scrap metal (cables, metal structures, panels) to recycler									
Shipped drained oil to processing facility									
Shipped lead acid batteries to recycler									
Backfill and recompact									
Remove and dispose of fencing									
Final Patch and Grade per plan									
Ensure all tools and equipment are removed.									
Final site cleanup									
Submit final reports and documentation									

APPENDIX 2, continued
Decommissioning Project Schedule-Escondido BESS

Decommissioning Plan and Sequence	Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Pre-Mobilization Planning	Develop De-energization plans with Customer, including PPE requirements															
	Develop equipment lifting and handling plan															
	Prepare materials needed at site (tools, pallets, packaging , labels)															
	Develop and approve site environmental and safety plans															
	Develop and approve security and site access plans (equipment access, gates, doors, staging area, parking)															
	Develop loading/pickup plans for batteries, scrap metal															
	Complete draft of BOL for hazardous materials															
	Obtain Utility agreement on de-energization plan and schedule															
	Complete site restoration and drainage plans															
	Obtain permits as needed															
	Physical obstacle to perform work have been removed.															
Mobilization	Setup site security and temporary facilities															
	Discuss site specific hazards and safety protocols															
	Perform job hazard assessments with Customer and perform work setup															
	Confirm laydown/temporary storage areas with Customer															
	Confirm emergency response procedures and contacts for fire or injury															
	Deliver metal scrap bins and packaging materials															
	Deliver forklift and handling equipment to site															
BESS AC Mains and DC Power LOTO	De-energize/LOTO AC side (mains) and DC power (Battery to Inverter) of Energy Storage System															
	De-energize/LOTO auxiliary power to battery switchgear															
	Set up limited approach boundry															
	Inspect and outfit in PPE. Minimum HRC3/PPE CAT 3 required during battery string power cable disconnects															
	Using insulated tools, remove battery module string power cables. (Note: After all string cables are removed PPE Cat 0 can be used.)															
Battery Module Removal and Shipment	Disconnect battery string power and communication cables															
	Remove Battery Modules and palletize for shipment															
	Ship battery modules to recycler															
Auxiliary Power LOTO	Disconnect and lockout Aux power supply from Medium Voltage Switchgear															
	Disconnect UPS and 125 VDC power															
	Disconnect Fire Control Panel backup batteries															
	Disconnect back up generator															
Utility Disconnect and LOTO	Disconnect and LOTO 12.47 KV power at Utility POC															
	Remove all utility company supplied meters,RTACs, CTs, SCADA equipment and ship to utility company															
Equipment Disassembly - Prep for Shipment	Drain and collect battery container AC refrigerant															
	Drain and collect inverter AC refrigerant															
	Remove and process fire suppression agent for disposal															
	Remove control house AC refrigerant															
	Drain and collect transformer oil															
	Remove and package UPS/125 VDC lead acid batteries for shipment/recycling															
	Remove exterior hoods, steps, hold down bolts from battery enclosures															
	Disconnect and remove all power and control cables between equipment															
	Mobilize crane															
Loading and Shipment	Load battery containers onto trucks for shipment to recycler															
	Load Inverter and/or transformers onto truck for shipment															
	Load control enclosure															
	Load MV switchgear															
	De-mobilize crane															
	Ship scrap metal (cables, metal structures, panels) to recycler															
	Shipped drained oil to processing facility															
	Shipped lead acid batteries to recycler															
Site Restoration	Backfill and recompact															
	Remove and dispose of fencing															
	Final Patch and Grade per plan															
De-mobilization	Ensure all tools and equipment are removed.															
	Final site cleanup															
	Submit final reports and documentation															

APPENDIX 3
Project Details-Borrego Microgrid 1
500 KW, 1500 KWH

Input Data		
Battery	Battery Make/Model	SAFT 24P
	Battery Chemistry	NMC
	Battery module weight (lbs)	42
	Battery Module Length (in)	18
	Battery Module Width (in)	12
	Battery Module CATL Liquid Cooled?	NO
	Number of battery racks per container	10
	Number of battery modules per rack	15
Enclosure	Number of battery enclosures (EOL)	3
	Estimated weight of battery enclosure without battery modules (lbs)	32000
	Battery enclosures HVAC cooled (wall or roof mount)?	YES
	Number of HVAC/Chiller Units per battery enclosure	1
	Clean agent fire suppression installed in enclosure?	YES
Inverter/PCS	Are Inverters/PCS pad mounted?	NO
	Is isolation transformer integrated with PCS?	NO
	Are inverters/PCS liquid or air cooled?	AIR
Transformer	Number of isolation transformers (pad mounted or integrated)	4
	Estimated weight of empty transformer (lbs)	8000
	Are there oil filled transformers?	YES
	Gallons of oil per transformer	166
Labor	Average Site Labor Cost ($/hr)	$110
Logistics	Shipping distance from site to battery recycling facility (miles)	2600
Schedule	Estimating Year	2021
	Decommissioning Year	2025
	Escalation (average ECI value since 2002)	1.025

APPENDIX 3, continued
Project Details-Borrego Microgrid 2
1000 KW, 3144 KWH

Input Data		
Battery	Battery Make/Model	SAFT 24E
	Battery Chemistry	NMC
	Battery module weight (lbs)	42
	Battery Module Length (in)	18
	Battery Module Width (in)	12
	Battery Module CATL Liquid Cooled?	NO
	Number of battery racks per container	10
	Number of battery modules per rack	15
Enclosure	Number of battery enclosures (EOL)	4
	Estimated weight of battery enclosure without battery modules (lbs)	32000
	Battery enclosures HVAC cooled (wall or roof mount)?	YES
	Number of HVAC/Chiller Units per battery enclosure	1
	Clean agent fire suppression installed in enclosure?	YES
Inverter/PCS	Are Inverters/PCS pad mounted?	NO
	Is isolation transformer integrated with PCS?	NO
	Are inverters/PCS liquid or air cooled?	AIR
Transformer	Number of isolation transformers (pad mounted or integrated)	2
	Estimated weight of empty transformer (lbs)	8000
	Are there oil filled transformers?	YES
	Gallons of oil per transformer	166
Labor	Average Site Labor Cost ($/hr)	$110
Logistics	Shipping distance from site to battery recycling facility (miles)	2600
Schedule	Estimating Year	2021
	Decommissioning Year	2025
	Labor Escalation (average ECI value since 2002)	1.025

APPENDIX 3, continued
Project Details-Top Gun Energy Storage
30 MW , 120 MWH

Input Data		
Battery	Battery Make/Model	Samsung E3
	Battery Chemistry	NMC
	Battery module weight (lbs)	125
	Battery Module Length (in)	25
	Battery Module Width (in)	15
	Battery Module CATL Liquid Cooled?	NO
	Number of battery racks per container	24
	Number of battery modules per rack	25
Enclosure	Number of battery enclosures (EOL)	36
	Estimated weight of battery enclosure without battery modules (lbs)	50000
	Battery enclosures HVAC cooled (wall or roof mount)?	YES
	Number of HVAC/Chiller Units per battery enclosure	2
	Clean agent fire suppression installed in enclosure?	YES
Inverter/PCS	Are Inverters/PCS pad mounted?	YES
	Number Inverters/PCS to be decommissioned	36
	Is isolation transformer integrated with PCS?	NO
	Estimated weight of inverter/PCS (lbs)	15500
	Inverter/PCS width (in)	244
	Inverter/PCS length (in)	84
	Are inverters/PCS liquid or air cooled?	LIQUID
Transformer	Number of isolation transformers (pad mounted or integrated)	36
	Estimated weight of empty transformer (lbs)	12000
	Are there oil filled transformers?	YES
	Gallons of oil per transformer	600
Labor	Average Site Labor Cost ($/hr)	$110
Logistics	Shipping distance from site to battery recycling facility (miles)	2600
Schedule	Estimating Year	2021
	Decommissioning Year	2041
	Escalation (average ECI value since 2002)	1.025

APPENDIX 3, continued
Project Details-Eastern BESS
7.5 MW, 30 MWH

Input Data

Battery	Battery Make/Model	Samsung (APS)
	Battery Chemistry	NMC
	Battery module weight (lbs)	110
	Battery Module Length (in)	21
	Battery Module Width (in)	18
	Battery Module CATL Liquid Cooled?	NO
	Number of battery racks per container	50
	Number of battery modules per rack	16
Enclosure	Number of battery enclosures (EOL)	6
	Estimated weight of battery enclosure without battery modules (lbs)	175000
	Battery enclosures HVAC cooled (wall or roof mount)?	YES
	Number of HVAC/Chiller Units per battery enclosure	2
	Clean agent fire suppression installed in enclosure?	YES
Inverter/PCS	Are Inverters/PCS pad mounted?	NO
	Number Inverters/PCS to be decommissioned	0
	Is isolation transformer integrated with PCS?	NO
	Estimated weight of inverter/PCS (lbs)	0
	Inverter/PCS width (in)	0
	Inverter/PCS length (in)	0
	Are inverters/PCS liquid or air cooled?	AIR
Transformer	Number of isolation transformers (pad mounted or integrated)	3
	Estimated weight of empty transformer (lbs)	12000
	Are there oil filled transformers?	YES
	Gallons of oil per transformer	460
Labor	Average Site Labor Cost ($/hr)	$110
Logistics	Shipping distance from site to battery recycling facility (miles)	2600
Schedule	Estimating Year	2021
	Decommissioning Year	2027
	Escalation (average ECI value since 2002)	1.025

APPENDIX 3, continued
Project Details-Escondido BESS
30MW, 120MWH

Input Data		
Battery	Battery Make/Model	Samsung (APS)
	Battery Chemistry	NMC
	Battery module weight (lbs)	110
	Battery Module Length (in)	21
	Battery Module Width (in)	18
	Battery Module CATL Liquid Cooled?	NO
	Number of battery racks per container	50
	Number of battery modules per rack	16
Enclosure	Number of battery enclosures (EOL)	24
	Estimated weight of battery enclosure without battery modules (lbs)	175000
	Battery enclosures HVAC cooled (wall or roof mount)?	YES
	Number of HVAC/Chiller Units per battery enclosure	2
	Clean agent fire suppression installed in enclosure?	YES
Inverter/PCS	Are Inverters/PCS pad mounted?	NO
	Number Inverters/PCS to be decommissioned	0
	Is isolation transformer integrated with PCS?	NO
	Estimated weight of inverter/PCS (lbs)	0
	Inverter/PCS width (in)	0
	Inverter/PCS length (in)	0
	Are inverters/PCS liquid or air cooled?	AIR
Transformer	Number of isolation transformers (pad mounted or integrated)	12
	Estimated weight of empty transformer (lbs)	12000
	Are there oil filled transformers?	YES
	Gallons of oil per transformer	460
Labor	Average Site Labor Cost ($/hr)	$110
Logistics	Shipping distance from site to battery recycling facility (miles)	2600
Schedule	Estimating Year	2021
	Decommissioning Year	2027
	Escalation (average ECI value since 2002)	1.025

APPENDIX4
Decommissioning Project Cost Estimates

Pricing Assumptions

In addition to Appendix 3 the following are the cost estimate assumptions used to determine overall project decommissioning costs:

- Battery recycling : Renewance works with all the recyclers in North America and has established recycling rates with them. Renewance selects the recycler based on the lowest cost option for the customer depending on the battery model, chemistry, recycling rates, location and other factors. The rates listed are assuming that the company who is doing the decommissioning adds on a 30% margin to the recyclers recycling rates
  - Battery Recycling (LFP) - $0.72/lb
  - Battery Recycling (NMC<50000 lbs) - $0.125/lb
  - Battery Recycling (NMC>50000 lbs) - $0.00/lb

- Battery Removal Labor = 15 man-minutes/module
  - The batteries have to be removed from the container and packaged before shipping to the recycler. The estimate is based on Renewance's experience decommissioning battery containers with similar battery types (weight & dimensions)

- Scrap Metal/E-Metal Recycle Credit (enclosures, PCS, panels) - $0.03/lb
  - Renewance's estimate based on BESS decom projects in California

- Transformers : Transformers typically have a long life and there is a strong secondary market for used transformers. The assumptions are based on Renewance's experience in selling used transformers in 2020 & 2021
  - Isolation Transformers Recycle Credit = $0.04/lb
  - Isolation Transformer Oil Recycling = $0.21/gallon

- Transportation : Batteries are considered Hazardous material and have to be shipped accordingly. Below assumptions are based on transportation rates obtained from Renewance's preferred freight forwarders who have transported batteries in the past
  - Hazmat Transportation = $5.50 per mile
  - Standard Transportation = $0.05/lb
  - Oversize Shipment (custom enclosures) = $0.10/lb

- Equipment Rental is based on typical rental rates from equipment rental companies in California
  - Crane Rental = $6500/day
  - Forklift Rental = $700/day

- Demolition and Site Restoration = 25-35% of total site labor+disposal+recycle
  - Site restoration for BESS decom projects varies drastically depending on how the site is supposed to look post decom. Usually the contract between the BESS owner & the landlord specifies the condition that the site should be left post decommissioning. Site restoration could be as simple as basic clean up to something complicated like completely restoring the site to original condition which could involve things like concrete or road removal, underground cable removal & extensive landscaping. After discussions with the SDGE team and reviewing the sites, this study assumes minimal site restoration which essentially is basic clean up, patching and repairing any cracks/holes left at the site after equipment removal

- Contingencies = 15% on Labor, Rentals, and Logistics. No contingency on battery recycling cost
- T&L (assumes local labor used) = $0

Decommissioning Project Cost Estimate -Borrego Microgrid 1
Details

	Item	Units	Labor Cost	Material/Rental/Logistics Cost	Disposal Cost	Recycling Cost/Credits	
Battery	Number of Battery Modules (EOL)	450					
	Total Battery Module Weight (lbs)	18,900					
	Battery Module Recycling Cost					$2,363	
	Battery Module Disassembly Prior Recycling Cost					$0	
	Battery Modules per 40 x 48 Pallet	21					
	Number of Pallets	22					
	Number of Truck Loads	1					
	Hazardous Material Shipping Cost ($/mi)	$5.50					
	Battery Logistic Cost			$14,300			
	Battery Module Removal and Packaging Cost (Labor and Materials)		$12,375	$550			
Enclosure	Refrigerant Recovery and Preparation				$900		
	Fire Suppression System Decommissioning/Agent Recovery				$1,350		
	Battery Enclosure Prep for Shipment Labor Cost		$2,640				
	Battery enclosure logistic costs			$4,800			
	Battery enclosure recycle credit					($2,880)	
Inverter/PCS	Inverter/PCS Coolant Disposal				$0		
	Pad mounted Inverter/PCS Prep for Ship Labor Cost		$0				
	Pad mounted Inverter/PCS logistics cost			$0			
	Pad mounted Inverter/PCS recycle credit					$0	
Transformer	Pad mounted transformer prep for ship labor cost		$2,200				
	Pad mounted transformer logistics cost			$1,600			
	Pad mounted transformer recycle credit					($1,280)	
	Transformer Oil recycling cost ($/gallon)	$0.21				$139	
	Oil collection/transport cost per transformer	$500			$2,000		
Crane/Forklift	Crane Rental Days	2					
	Crane Rental Cost /Day	$6,500					
	Crane Rental Cost			$13,000			
	Forklift Rental Days	4.5					
	Forklift Rental Cost /Day	$700					
	Forklift Rental Cost			$3,150			
Schedule/Other	Total Project Duration	28.5					
	Total Onsite Duration	6.5					
	Mobilization/LOTO	2	$7,040				
	Loading and Handling	3					
	Demobilization	1	$3,520				
	Site Mangement		$8,125				
	Project/Logisitcs Management		$7,125				
Estimates	Total Cost Estimate (2021 dollars)		$43,025	$37,400	$4,250	($1,658)	$83,017
	Total Cost Estimate in Decommissiong Year		$47,492	$41,283	$4,691	($1,658)	$91,807
	Labor Escalation 1.025 (average ECI value since 2002)	1.025					

NOTES:
All cost estimates in USD
No change in recycling cost estimate with time. Increased recycling volume will offset inflation costs.

Demolition and Site Cleanu $11,404.24

Decommissioning Project Cost Estimate -Borrego Microgrid 1
Summary

Estimating Year	2021	2025
Project / Site Management, Preparation & Mobilization	$ 14,165	$ 15,636
Site Services (Electrical work, Labor for battery removal, Equipment Rental)	$ 49,399	$ 54,528
Battery Recycling	$ 2,363	$ 2,608
Transportation & Logistics	$ 15,490	$ 17,098
Site Restoration (Foundation Removal, Patch, Grade, Cleanup)	$ 11,404	$ 12,588
Contingency	$ 13,569	$ 14,977
Total	$ 106,390	$ 117,435

Decommissioning Project Cost Estimate -Borrego Microgrid 2
Details

	Item	Units	Labor Cost	Material/Rental/Logistics Cost	Disposal Cost	Recycling Cost/Credits
Battery	Number of Battery Modules (EOL)	600				
	Total Battery Module Weight (lbs)	25,200				
	Battery Module Recycling Cost					$3,150
	Battery Module Disassembly Prior Recycling Cost					$0
	Battery Modules per 40 x 48 Pallet	21				
	Number of Pallets	29				
	Number of Truck Loads	1.2				
	Hazardous Material Shipping Cost ($/mi)	$5.50				
	Battery Logistic Cost			$17,160		
	Battery Module Removal and Packaging Cost (Labor and Materials)		$16,500	$725		
Enclosure	Refrigerant Recovery and Preparation				$1,200	
	Fire Suppression System Decommissioning/Agent Recovery				$1,800	
	Battery Enclosure Prep for Shipment Labor Cost		$3,520			
	Battery enclosure logistic costs			$6,400		
	Battery enclosure recycle credit					($3,840)
Inverter/PCS	Inverter/PCS Coolant Disposal				$0	
	Pad mounted Inverter/PCS Prep for Ship Labor Cost		$0			
	Pad mounted Inverter/PCS logistics cost			$0		
	Pad mounted Inverter/PCS recycle credit					$0
Transformer	Pad mounted transformer prep for ship labor cost		$1,100			
	Pad mounted transformer logistics cost			$800		
	Pad mounted transformer recycle credit					($640)
	Transformer Oil recycling cost ($/gallon)	$0.21				$70
	Oil collection/transport cost per transformer	$500			$1,000	
Crane/Forklift	Crane Rental Days	2.4				
	Crane Rental Cost /Day	$6,500				
	Crane Rental Cost			$15,600		
	Forklift Rental Days	5.4				
	Forklift Rental Cost /Day	$700				
	Forklift Rental Cost			$3,780		
Schedule/Other	Total Project Duration	29.4				
	Total Onsite Duration	7.4				
	Mobilization/LOTO	2	$7,040			
	Loading and Handling	3				
	Demobilization	1	$3,520			
	Site Mangement		$9,250			
	Project/Logisitcs Management		$7,350			
Estimates	Total Cost Estimate (2021 dollars)		$48,280	$44,465	$4,000	($1,260)
	Total Cost Estimate in Decommissiong Year		$53,292	$49,081	$4,415	($1,260)
	Labor Escalation 1.025 (average ECI value since 2002)	1.025				

	$95,485
	$105,528

NOTES:
All cost estimates in USD
No change in recycling cost estimate with time. Increased recycling volume will offset inflation costs.

Demolition and Site Cleanup (2021)	$12,754.93

Decommissioning Project Cost Estimate -Borrego Microgrid 2
Summary

Year	2021	2025
Project / Site Management, Preparation & Mobilization	$ 14,390	$ 15,884
Site Services (Electrical work, Labor for battery removal, Equipment Rental)	$ 57,340	$ 63,292
Battery Recycling	$ 3,150	$ 3,477
Transportation & Logistics	$ 19,805	$ 21,861
Site Restoration (Foundation Removal, Patch, Grade, Cleanup)	$ 12,755	$ 14,079
Contingency	$ 15,643	$ 17,267
Total	$ 123,083	$ 135,861

Decommissioning Project Cost Estimate – Top Gun Energy Storage
Details

	Item	Units	Labor Cost	Material/Rental/Logistics Cost	Disposal Cost	Recycling Cost/Credits	
Battery	Number of Battery Modules (EOL)	21,600					
	Total Battery Module Weight (lbs)	2,700,000					
	Battery Module Recycling Cost					$0	
	Battery Module Disassembly Prior Recycling Cost					$0	
	Battery Modules per 40 x 48 Pallet	12					
	Number of Pallets	1800					
	Number of Truck Loads	72					
	Hazardous Material Shipping Cost ($/mi)	$5.50					
	Battery Logistic Cost			$1,029,600			
	Battery Module Removal and Packaging Cost (Labor and Materials)		$594,000	$45,000			
Enclosure	Refrigerant Recovery and Preparation				$21,600		
	Fire Suppression System Decommissioning/Agent Recovery				$16,200		
	Battery Enclosure Prep for Shipment Labor Cost		$31,680				
	Battery enclosure logistic costs			$90,000			
	Battery enclosure recycle credit					($54,000)	
Inverter/PCS	Inverter/PCS Coolant Disposal				$10,620		
	Pad mounted Inverter/PCS Prep for Ship Labor Cost		$19,800				
	Pad mounted Inverter/PCS logistics cost			$27,900			
	Pad mounted Inverter/PCS recycle credit					($16,740)	
Transformer	Pad mounted transformer prep for ship labor cost		$19,800				
	Pad mounted transformer logistics cost			$21,600			
	Pad mounted transformer recycle credit					($17,280)	
	Transformer Oil recycling cost ($/gallon)	$0.21				$4,536	
	Oil collection/transport cost per transformer	$500			$18,000		
Crane/Forklift	Crane Rental Days	13					
	Crane Rental Cost /Day	$6,500					
	Crane Rental Cost			$84,500			
	Forklift Rental Days	32					
	Forklift Rental Cost /Day	$700					
	Forklift Rental Cost			$22,400			
Schedule/Other	Total Project Duration	56					
	Total Onsite Duration	34					
	Mobilization/LOTO	2	$7,040				
	Loading and Handling	37					
	Demobilization	1	$3,520				
	Site Mangement		$42,500				
	Project/Logisitcs Management		$14,000				
Estimates	Total Cost Estimate (2021 dollars)		$732,340	$1,321,000	$66,420	($83,484)	$2,036,276
	Total Cost Estimate in Decommissiong Year		$1,200,024	$2,164,612	$108,837	($83,484)	$3,389,990
	Labor Escalation 1.025 (average ECI value since 2002)	1.025					

NOTES:
All cost estimates in USD
No change in recycling cost estimate with time. Increased recycling volume will offset inflation costs.

Demolition and Site Cleanu $178,819.00

Decommissioning Project Cost Estimate – Top Gun Energy Storage
Summary

Estimating Year	2021	2041
Project / Site Management, Preparation & Mobilization	$ 21,040	$ 34,476
Site Services (Electrical work, Labor for battery removal, Equipment Rental)	$ 858,736	$ 1,407,139
Battery Recycling	$ -	$ -
Transportation & Logistics	$ 1,093,320	$ 1,791,532
Site Restoration (Foundation Removal, Patch, Grade, Cleanup)	$ 178,819	$ 293,016
Contingency	$ 322,787	$ 528,924
Total	$ 2,474,702	$ 4,055,088

Decommissioning Project Cost Estimate – Eastern BESS
Details

	Item	Units	Labor Cost	Material/Rental/Logistics Cost	Disposal Cost	Recycling Cost/Credits	
Battery	Number of Battery Modules (EOL)	4,800					
	Total Battery Module Weight (lbs)	528,000					
	Battery Module Recycling Cost					$0	
	Battery Module Disassembly Prior Recycling Cost					$0	
	Battery Modules per 40 x 48 Pallet	12					
	Number of Pallets	400					
	Number of Truck Loads	16					
	Hazardous Material Shipping Cost ($/mi)	$5.50					
	Battery Logistic Cost			$228,800			
	Battery Module Removal and Packaging Cost (Labor and Materials)		$132,000	$10,000			
Enclosure	Refrigerant Recovery and Preparation (added labor to remove HVAC)		$10,560		$3,600		
	Fire Suppression System Decommissioning/Agent Recovery				$2,700		
	Battery Enclosure Prep for Shipment Labor Cost (oversized)		$7,920				
	Battery enclosure logistic costs (heavy/oversize load)			$105,000			
	Battery enclosure recycle credit					($31,500)	
Inverter/PCS	Inverter/PCS Coolant Disposal				$0		
	Pad mounted Inverter/PCS Prep for Ship Labor Cost		$0				
	Pad mounted Inverter/PCS logistics cost			$0			
	Pad mounted Inverter/PCS recycle credit					$0	
Transformer	Pad mounted transformer prep for ship labor cost		$1,650				
	Pad mounted transformer logistics cost			$1,800			
	Pad mounted transformer recycle credit					($1,440)	
	Transformer Oil recycling cost ($/gallon)	$0.21				$290	
	Oil collection/transport cost per transformer	$500			$1,500		
Crane/Forklift	Crane Rental Days	3					
	Crane Rental Cost /Day	$6,500					
	Crane Rental Cost (2x to include load and unload)			$39,000			
	Forklift Rental Days	7					
	Forklift Rental Cost /Day	$700					
	Forklift Rental Cost			$4,900			
Schedule/Other	Total Project Duration	31					
	Total Onsite Duration	9					
	Mobilization/LOTO	2	$7,040				
	Loading and Handling	9					
	Demobilization	1	$3,520				
	Site Mangement		$11,250				
	Project/Logisitcs Management		$31,000				
Estimates	Total Cost Estimate (2021 dollars)		$204,940	$389,500	$7,800	($32,650)	$569,590
	Total Cost Estimate in Decommissiong Year		$237,668	$451,701	$9,046	($32,650)	$665,764
	Labor Escalation 1.025 (average ECI value since 2002)	1.025					

NOTES:
All cost estimates in USD
No change in recycling cost estimate with time. Increased recycling volume will offset inflation costs.

Demolition and Site Cleanu $63,031.43

Decommissioning Project Cost Estimate – Eastern BESS
Summary

Estimating Year	2021	2027
Project / Site Management, Preparation & Mobilization	$ 38,040	$ 44,115
Site Services (Electrical work, Labor for battery removal, Equipment Rental)	$ 208,330	$ 241,599
Battery Recycling	$ -	$ -
Transportation & Logistics	$ 310,860	$ 360,502
Site Restoration (Foundation Removal, Patch, Grade, Cleanup)	$ 63,031	$ 73,097
Contingency	$ 93,039	$ 107,897
Total	$ 713,300	$ 827,210

Decommissioning Project Cost Estimate – Escondido BESS
Details

	Item	Units	Labor Cost	Material/Rental/Logistics Cost	Disposal Cost	Recycling Cost/Credits	
Battery	Number of Battery Modules (EOL)	19,200					
	Total Battery Module Weight (lbs)	2,112,000					
	Battery Module Recycling Cost					$0	
	Battery Module Disassembly Prior Recycling Cost					$0	
	Battery Modules per 40 x 48 Pallet	12					
	Number of Pallets	1600					
	Number of Truck Loads	64					
	Hazardous Material Shipping Cost ($/mi)	$5.50					
	Battery Logistic Cost			$915,200			
	Battery Module Removal and Packaging Cost (Labor and Materials)		$528,000	$40,000			
Enclosure	Refrigerant Recovery and Preparation (added labor to remove HVAC)		$42,240		$14,400		
	Fire Suppression System Decommissioning/Agent Recovery				$10,800		
	Battery Enclosure Prep for Shipment Labor Cost (oversized)		$31,680				
	Battery enclosure logistic costs (heavy/oversize load)			$420,000			
	Battery enclosure recycle credit					($126,000)	
Inverter/PCS	Inverter/PCS Coolant Disposal				$0		
	Pad mounted Inverter/PCS Prep for Ship Labor Cost		$0				
	Pad mounted Inverter/PCS logistics cost			$0			
	Pad mounted Inverter/PCS recycle credit					$0	
Transformer	Pad mounted transformer prep for ship labor cost		$6,600				
	Pad mounted transformer logistics cost			$7,200			
	Pad mounted transformer recycle credit					($5,760)	
	Transformer Oil recycling cost ($/gallon)	$0.21				$1,159	
	Oil collection/transport cost per transformer	$500			$6,000		
Crane/Forklift	Crane Rental Days	9					
	Crane Rental Cost /Day	$6,500					
	Crane Rental Cost (2x to include load and unload)			$117,000			
	Forklift Rental Days	22					
	Forklift Rental Cost /Day	$700					
	Forklift Rental Cost			$15,400			
Schedule/Other	Total Project Duration	46					
	Total Onsite Duration	24					
	Mobilization/LOTO	2	$7,040				
	Loading and Handling	31					
	Demobilization	1	$3,520				
	Site Mangement		$30,000				
	Project/Logisitcs Management		$46,000				
Estimates	Total Cost Estimate (2021 dollars)		$695,080	$1,514,800	$31,200	($130,601)	$2,110,479
	Total Cost Estimate in Decommissiong Year		$806,080	$1,756,704	$36,182	($130,601)	$2,468,365
	Labor Escalation 1.025 (average ECI value since 2002)	1.025					

NOTES:
All cost estimates in USD
No change in recycling cost estimate with time. Increased recycling volume will offset inflation costs.

Demolition and Site Cleanu $208,487.72

Decommissioning Project Cost Estimate – Escondido BESS
Summary

Estimating Year	2021	2027
Project / Site Management, Preparation & Mobilization	$ 53,040	$ 61,510
Site Services (Electrical work, Labor for battery removal, Equipment Rental)	$ 764,559	$ 886,654
Battery Recycling	$ -	$ -
Transportation & Logistics	$ 1,243,440	$ 1,442,009
Site Restoration (Foundation Removal, Patch, Grade, Cleanup)	$ 208,488	$ 241,782
Contingency	$ 340,429	$ 394,793
Total	$ 2,609,956	$ 3,026,749

SL-016628.A_SDGE Decom(Palomar)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Palomar Energy Center

Prepared by Sargent & Lundy

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Sargent & Lundy is one of the oldest and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Sargent & Lundy delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public and private sector clients in the power and energy, gas distribution, industrial, and government sectors.

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VERSION LOG

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Draft v0	December 1, 2021	Initial Issue
Final	April 4, 2022	Section 1.3

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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	April 4, 2022
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TABLE OF CONTENTS

TABLES

APPENDIXES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
CT	combustion turbine
FERC	Federal Energy Regulatory Commission
G&A	general and administrative
GE	General Electric
GSU	generator step-up transformer
HRSG	heat recovery steam generator
Owner	San Diego Gas & Electric Company
Palomar	Palomar Energy Center
PCB	polychlorinated biphenyl
S&L	Sargent & Lundy, L.L.C.
SCR	selective catalytic reduction
SDG&E	San Diego Gas & Electric Company
ST	steam turbine

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of Palomar Energy Center (Palomar) and estimate the average service life of the facility's peer group. Palomar is a 2x1 natural gas-fired, combined-cycle project (588 MW) in Escondido, California. The work scope included updating the 2016 conceptual demolition cost estimate and report as well as conducting a benchmarking analysis for the facility.

METHODOLOGY

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition costs and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by SDG&E. These drawings and documents were used to estimate the building foundation sizes, building volumes, and quantities of steel, piping, valves, and other equipment. A site walkdown was performed to conduct a review of the site for dismantlement and determine any specific site-unique requirements. This site walkdown was performed in 2016; however, recent discussions with the Owner and facility management confirmed that no significant modifications have occurred since that time. This information was used with unit cost factors developed by S&L based on industry data and S&L experience. Unit cost factors for concrete removal, steel removal, cutting costs, etc. were developed from labor and material cost information. S&L estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

The benchmarking analysis considers publicly available data to determine the average service life of similar facilities.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning Palomar is shown in Table ES-1. The cost estimate broken into FERC accounts is shown in Table ES-2. All costs are in 2021 U.S. dollars, and the total is the same in both tables: $12,014,670. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

Table ES-1 — Palomar Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Cost	**$7,754,704**	**–**
Labor	–	$5,180,119
Subcontracts	–	$372,500
Equipment	–	$1,440,078
Material	–	$762,007
General Condition (Decommissioning Contractor Indirect) Costs	**$3,195,069**	**–**
Scrap Value	**($1,880,519)**	**–**
Subtotal Demolition Contractor Costs	**$9,069,254**	**–**
Project Indirect Costs	**$1,133,000**	**–**
Engineering	–	$231,000
SDG&E Internal Costs	–	$902,000
Contingency Cost	**$1,812,416**	**–**
Total Project Cost	**$12,014,670**	**–**

Table ES-2 — Palomar Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
311	Other Production – Structures & Improvements	$1,926,247
312	Boiler Plant Equipment	$3,334,916
314	Turbo Generator Units	$3,052,089
315	Accessory Electrical Equipment	$484,650
316	Miscellaneous Power Plant Equipment	$165,083
341	Other Production – Structures and Improvements	$636,144
342	Other Production – Fuel Holders, Producers, and Accessories	$346,465
344	Other Production – Generators	$1,732,669
345	Other Production – Accessory Electric Equipment	$336,407
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$12,014,670**

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform a conceptual cost estimate for the dismantlement of the Palomar Energy Center (Palomar) in Escondido, California and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate report and performing a benchmarking analysis.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers over the years, the Sargent & Lundy Consulting Group has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineer services—including decommissioning cost estimation and average service life evaluation—for both global and domestic electric power assets.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations experience to support consulting services such as those performed for Palomar.

1.3. FACILITY DESCRIPTION

Palomar, located in northern San Diego County, Escondido, California, consists of two GE Frame 7FA (PG7241FA) combustion turbine (CT) generators and a single steam turbine (ST) generator. Each CT exhausts into a separate heat recovery steam generator (HRSG), each of which has a selective catalytic reduction (SCR) system for NO_X reduction and an oxidation catalyst to reduce volatile organic compounds (VOCs) and carbon monoxide (CO). Each HRSG is also provided with natural gas-fired duct burners that provide additional steam production to increase the net plant generating output during peak load periods. The steam produced by the two HRSGs is supplied to a single ST generator. The turbine exhaust steam is condensed in a steam surface condenser by transferring the heat to the circulating cooling water. The heat in the circulating water is then rejected to the atmosphere in an evaporative cooling tower.

The nameplate rating (i.e., the full-load continuous rating of a generator under specified conditions as designated by the manufacturer) of Palomar is 588 MW following an uprate. Palomar is configured so that it may operate using either of the CTs alone or one CT with the ST. The CTs were up-rated to 176 MW nominal each, and the steam turbine was up-rated to 236 MW nominal. This gives Palomar operational flexibility to respond to a varying load demand while optimizing efficiency. With two CTs feeding two HRSGs feeding one steam turbine, this configuration is referred to as a 2x1 combined-cycle plant and is typical of modern high-efficiency plant installations of this capacity in use by utilities and merchant generators throughout the United States and abroad.

The CTs are capable of producing more power, and are more efficient, with colder inlet temperatures. As such, Palomar is equipped with a chiller system that can reduce the turbine inlet temperature to approximately 50°F. This reduction in temperature allows the plant to increase output on hot summer days when the system electrical demand is the highest.

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of stochastic and deterministic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, linear feet of piping, equipment, etc.). Stochastic methods were also used if quantitative information (e.g., fire lines and hydrants, miscellaneous electrical equipment, etc.) was unavailable.

The cost estimate was developed based on drawings, documents, and data provided by the Owner. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment.

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition cost and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes for previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates include both summaries and details for each type of work performed, indirect costs, and contingencies. The cost estimate database report lists costs by buildings, plant systems, and several other categories.

An inventory of plant piping, valves, equipment, HVAC ducts, concrete, galleries, cable tray, and other equipment was developed based on a review of drawings and a site walkdown to conduct a review for dismantlement and determine any specific site-unique requirements. This information was used with unit cost factors developed by S&L based on industry data and S&L experience. Unit cost factors for concrete removal, steel removal, cutting costs, and other tasks were developed from labor and material cost information. S&L also estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

S&L worked from site general arrangement drawings and company documentation for the facilities, including information about any existing metal cleaning storage ponds, asbestos inventories, biphenyl (PCB) inventories, or sludge ponds. S&L relied on SDG&E to identify the location of environmental issues that need to be considered in the estimates, since S&L's scope of work excludes doing a detailed survey and testing program to identify such problems.

2.2. COST ESTIMATE SUMMARY

The summary of the cost estimate for decommissioning Palomar is shown in Table 2-1. The commercial and technical basis for the estimate is described in Section 0. The detailed estimate is included in Appendix A. The summary breakdown into FERC accounts is shown in Table 2-2, and the detailed allocation of FERC accounts is shown in Appendix B. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

The 2021 cost estimate format was changed to be consistent with S&L's current standards. The variance between the 2021 and 2016 cost estimate is shown in Appendix C.

Table 2-1 — Palomar Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Cost	**$7,754,704**	**–**
Labor	–	$5,180,119
Subcontracts	–	$372,500
Equipment	–	$1,440,078
Material	–	$762,007
General Condition (Decommissioning Contractor Indirect) Costs	**$3,195,069**	**–**
Scrap Value	**($1,880,519)**	**–**
Subtotal Demolition Contractor Costs	**$9,069,254**	**–**
Project Indirect Costs	**$1,133,000**	**–**
Engineering	–	$231,000
SDG&E Internal Costs	–	$902,000
Contingency Cost	**$1,812,416**	**–**
Total Project Cost	**$12,014,670**	**–**

Table 2-2 — Palomar Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
311	Other Production – Structures & Improvements	$1,926,247
312	Boiler Plant Equipment	$3,334,916
314	Turbo Generator Units	$3,052,089
315	Accessory Electrical Equipment	$484,650
316	Miscellaneous Power Plant Equipment	$165,083
341	Other Production – Structures and Improvements	$636,144

FERC No.	Description	Total Cost
342	Other Production – Fuel Holders, Producers, and Accessories	$346,465
344	Other Production – Generators	$1,732,669
345	Other Production – Accessory Electric Equipment	$336,407
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$12,014,670**

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for San Diego, California as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for arrival time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from supplied engineering information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included for the decommissioning contractor indirect costs in the cost estimate for the following:

   - Labor supervision (additional compensation for labor foreman/supervisors)
   - Construction management
   - Field office expenses
   - Safety
   - Temporary facilities
   - Mobilization/demobilization
   - Legal expenses/claims
   - Small tools and consumables
   - General liability insurance
   - Construction equipment mobilization/demobilization
   - Freight on material
   - Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

- Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

5. Scrap

Scrap metals are a globally traded commodity and part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions, as such the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is estimated at $30/ton, resulting in the values shown in Table 3-1:

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
#2 Copper	6,145
#2 Insulated Copper Wire	2,440

Note: 1 ton = 2000 lbs.

6. Project Schedule

Palomar has an 18-month construction schedule.

7. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, the engineering required to place the plant in a safe shutdown, and any unique engineering required during demolition.
- SDG&E internal costs are included to cover costs in support of decommissioning the facility.

Table 3-2 — SDG&E Internal Costs in Support of Decommissioning

Activity	Estimated Cost
Labor to prepare the site for demolition, including drain oils, drain reagents, de-energization of the power buses, etc.	$602,000
Site security	$80,000
Subcontracts to remove chemicals, oils, and reagents from the site	$100,000
SDG&E project management, permitting, and procurement	$120,000
Total	**$902,000**

[1] www.americanrecycler.com

8. Escalation Rates

Escalation rates were excluded from the estimates.

9. Sales and Use Taxes

Sales and use taxes were excluded from the estimates.

10. Contingency

- A 15% contingency is applied for labor, material, equipment, subcontracting, and indirect costs. General conditions (indirect demolition contractor costs) are allocated across labor, material, and equipment.
- There is no contingency on scrap value.

11. Contract Basis for Estimate

The contracting strategy is a multiple lump sum for the estimate.

12. Assumptions

- The facility will be in safe-shutdown mode and ready for a decommissioning contractor to start work.
- All chemicals and lubricating oils will be removed from the facilities to be demolished by the utility before demolition.
- No extraordinary environmental costs for demolition will be needed.
- There will be no PCBs on site at the time of demolition.
- Switchyards within the plant boundaries are not part of the scope, nor are access roads to these facilities.
- All items above grade and to a depth of one foot will be demolished. Any other items buried more than one foot deep will remain in place.
- Underground piping will be abandoned in place.
- Underground piping larger than four feet in diameter will be filled with sand or slurry and capped at the ends to prevent collapse (none noted at this site). Non-metal pipe will be collapsed.
- All demolished materials are considered debris, except for organic combustibles and non-embedded metals which have scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- Handling onsite and offsite disposal of hazardous materials will be performed in compliance with methods approved by SDG&E's Environmental Services Department.
- All borrow (fill) material is assumed to be from offsite sources.
- Catalyst is assumed to be removed and returned to the original equipment manufacturer before demolition.

4. REFERENCES

1. Sargent & Lundy Cost Data Base
2. RSMeans Cost Data, 2021.
3. Engineering Drawings, Equipment Lists, O&M Records and other information provided by the San Diego Gas & Electric.
4. 2020 Form EIA-860 Data – Schedule 3, “Generator Data” (Retired & Canceled Units Only)
5. *Scrap Metals MarketWatch*, West Coast (Zone 1), www.americanrecycler.com

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DISMANTLE PALOMAR ENERGY CENTER

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	30611C

Group	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00	WHOLE PLANT DEMOLITION				57,055	4,734,896	1,314,594	6,049,490
18.00.00	SCRAP VALUE		(1,880,519)		0			(1,880,519)
21.00.00	CIVIL WORK	372,500		334,807	4,169	310,245	102,647	1,120,198
22.00.00	CONCRETE			427,200	1,780	134,977	22,837	585,015
	TOTAL DIRECT	372,500	(1,880,519)	762,007	63,004	5,180,119	1,440,078	5,874,185

Estimate Totals

Description	Amount	Totals	Hours
Labor	5,180,119		63,004 hrs
Material	762,007		
Subcontract	372,500		
Construction Equipment	1,440,078		hrs
Scrap Value	(1,880,519)		
	5,874,185	**5,874,185**	
General Conditions			
Additional Labor Costs			
90-1 Labor Supervision	310,807		
90-2 Show-up Time	103,602		
90-3 Cost Due To OT 5-10's			
90-4 Cost Due To OT 6-10's			
90-5 Per Diem			
Site Overheads			
91-1 Construction Management	559,453		
91-2 Field Office Expenses	123,080		
91-3 Material&Quality Control			
91-4 Site Services			
91-5 Safety	110,520		
91-6 Temporary Facilities	84,086		
91-7 Temporary Utilities			
91-8 Mobilization/Demob.	88,617		
91-9 Legal Expenses/Claims	13,091		
Other Construction Indirects			
92-1 Small Tools & Consumables	55,945		
92-2 Scaffolding			
92-3 General Liability Insur.	55,945		
92-4 Constr. Equip. Mob/Demob	144,008		
92-5 Freight on Material	38,100		
92-6 Freight on Scrap			
92-7 Sales Tax			
92-8 Contractors G&A	620,864		
92-9 Contractors Profit	886,951		
	3,195,069	**9,069,254**	
Project Indirect Costs			
93-1 Engineering Services	231,000		
93-2 CM Support			
93-3 Start-Up/Commissioning			
93-4 Start-Up/Spare Parts			
93-5 Excess Liability Insur.			
93-6 Sales Tax On Indirects			
93-7 SDG&E Internal Costs	902,000		
93-8 EPC Fee			
	1,133,000	**10,202,254**	
Contingency			
94-1 Contingency on Const Eq	274,335		
94-3 Contingency on Material	140,419		
94-4 Contingency on Labor	1,171,837		
94-5 Contingency on Subcontr.	55,875		
94-6 Contingency on Scrap			
94-7 Contingency on Indirect	169,950		
	1,812,416	**12,014,670**	
Escalation			
96-1 Escalation on Const Equip			
96-3 Escalation on Material			
96-4 Escalation on Labor			
96-5 Escalation on Subcontract			
96-6 Escalation on Scrap			
96-7 Escalation on Indirects			
		12,014,670	
98 Interest During Constr			
		12,014,670	
Total		**12,014,670**	

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00		**WHOLE PLANT DEMOLITION**									
	10.21.00	**CIVIL WORK**									
		PAVED SURFACES, 6 IN THICK	STEAM PLANT	3,744.00 SY	-	-		449	39,919	20,748	60,666
		PAVED SURFACES, 6 IN THICK	OTHER PRODUCTION	3,744.00 SY	-	-		449	39,919	20,748	60,666
		CIVIL WORK						**899**	**79,837**	**41,496**	**121,333**
	10.22.00	**CONCRETE**									
		COMBUSTION TURBINE AREA MAT @ NORTH END	U-1, 2004-005-SF-005	33.00 CY	-	-		37	3,313	816	4,129
		COMBUSTION TURBINE AREA MAT @ NORTH END	U-2, 2004-005-SF-005	30.00 CY	-	-		34	3,012	742	3,754
		PEECC & ACCESSORY MODULE FDN	U-1, 2004-005-SF-006	389.00 CY	-	-		438	39,054	9,623	48,677
		COMBUSTION TURBINE AREA MAT AT EAST END	U-1, 2004-005-SF-007A	63.00 CY	-	-		71	6,325	1,559	7,883
		COMBUSTION TURBINE AREA MAT AT EAST END	U-2, 2004-005-SF-007B	121.00 CY	-	-		136	12,148	2,993	15,141
		STEAM TURBINE GEN FDN BASE MAT	U-3, 2004-005-SF-009	1,322.00 CY	-	-		1,487	132,722	32,705	165,427
		COOLING TOWER FDN	U-3, 2004-005-SF-021A	1,544.00 CY	-	-		1,737	155,010	38,197	193,207
		HRSG / STACK FDN	U-1, 2004-005-SF-025	948.00 CY	-	-		1,067	95,174	23,452	118,627
		HRSG / STACK FDN	U-2, 2004-005-SF-025	948.00 CY	-	-		1,067	95,174	23,452	118,627
		HRSG EAST AREA MAT	U-1, 2004-005-SF-028	197.00 CY	-	-		222	19,778	4,874	24,651
		HRSG EAST AREA MAT	U-2, 2004-005-SF-028	160.00 CY	-	-		180	16,063	3,958	20,021
		CTG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-1, 2004-005-SF-029A	250.00 CY	-	-		281	25,099	6,185	31,283
		CTG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-2, 2004-005-SF-029B	241.00 CY	-	-		271	24,195	5,962	30,157
		STG ROTOR REMOVAL PLATFORM FDN	U-3, 2004-005-SF-030	35.00 CY	-	-		39	3,514	866	4,380
		STG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-3, 2004-005-SF-031	180.00 CY	-	-		203	18,071	4,453	22,524
		5 KV SWITCHGEAR MODULE FDN	U-3, 2004-005-SF-033	116.00 CY	-	-		131	11,646	2,870	14,516
		EXCITATION XFMR & ISOLATION XFMR	U-2, 2004-005-SF-034	49.00 CY	-	-		55	4,919	1,212	6,132
		AQUEOUS AMMONIA STORAGE TANK AND UNLOADING AREA FDNS	U-2, 2004-005-SF-037	196.00 CY	-	-		221	19,677	4,849	24,526
		FUEL GAS COMPRESSOR FDN	U-0, 2004-005-SF-040	161.00 CY	-	-		181	16,164	3,983	20,147
		FINGER RACK AREA MAT	U-1, 2004-005-SF-047A	248.00 CY	-	-		279	24,898	6,135	31,033
		FINGER RACK AREA MAT	U-2, 2004-005-SF-047B	236.00 CY	-	-		266	23,693	5,838	29,532
		WEST AREA MAT @ TUR-CTG1-01	U-1, 2004-005-SF-053	142.00 CY	-	-		160	14,256	3,513	17,769
		WEST AREA MAT @ TUR-CTG2-01	U-2, 2004-005-SF-054	143.00 CY	-	-		161	14,356	3,538	17,894
		COOLING TOWER CHEMICAL FEED BLDG AND UNLOADING CONTAINMENT FDNS	U-2, 2004-005-SF-060A & B	239.00 CY	-	-		269	23,994	5,913	29,907
		STG WEST AREA MAT	U-3, 2004-005-SF-061	49.00 CY	-	-		55	4,919	1,212	6,132
		TRAVELLING TOWER CONSTRUCTION CRANE FDN	U-0 2004-005-SF-078	117.00 CY	-	-		132	11,746	2,894	14,641
		STATIONARY TOWER CONSTRUCTION CRANE FDN	U-0 2004-005-SF-079	162.00 CY	-	-		182	16,264	4,008	20,272
		STG NORTH ARE MAT	U-0 2004-005-SF-080A	341.00 CY	-	-		384	34,235	8,436	42,671
		RO PERMEATE STORAGE TANK FDN	U-0 2004-005-SF-082	25.00 CY	-	-		28	2,510	618	3,128
		RAW WATER STORAGE TANK FDN	U-0 2004-005-SF-089	57.00 CY	-	-		64	5,723	1,410	7,133
		DEMIN WATER STORAGE TANK FDN	U-0 2004-005-SF-090	52.00 CY	-	-		59	5,221	1,286	6,507
		THERMAL ENERGY STORAGE (TES) TANK FDN	U-0 2004-005-SF-090	364.00 CY	-	-		410	36,544	9,005	45,549
		MISC FDNS	U-0 2004-005-SF, 50% Steam Plant	278.00 CY	-	-		313	27,910	6,877	34,787
		MISC FDNS	U-0 2004-005-SF, 50% Steam Plant	278.00 CY	-	-		313	27,910	6,877	34,787
		ADMINISTRATION/WAREHOUSE/SHOP WT BLDG	U-0, 130'X34'X2'+100'X11'X2' - 50% Steam Plant	205.00 CY	-	-		231	20,581	5,071	25,652
		ADMINISTRATION/WAREHOUSE/SHOP WT BLDG	U-0, 130'X34'X2'+100'X11'X2' - 50% Steam Plant	205.00 CY	-	-		231	20,581	5,071	25,652
		CHILLER PREFAB FLDG	U-3, S200	467.00 CY	-	-		525	46,884	11,553	58,437
		TOOL STORAGE BLDG (#127)	50% Steam Plant	67.00 CY	-	-		75	6,726	1,658	8,384
		TOOL STORAGE BLDG (#127)	50% Other Plant	67.00 CY	-	-		75	6,726	1,658	8,384
		WATER LAB	U-0, 40'X35'X2'	104.00 CY	-	-		117	10,441	2,573	13,014
		FAB SHOP	U-0, 20'X40'X2'	59.00 CY	-	-		66	5,923	1,460	7,383
		SWITCHGEAR BUILDING	U-0, 5'X35'X2'	13.00 CY	-	-		15	1,305	322	1,627
		NEW CT2 LCI W/PDC BUILDING	U-2, 12'X20'X2'	17.00 CY	-	-		19	1,707	421	2,127
		DIESEL GENERATOR FDN	U-0, 12'X26'X1.5'	18.00 CY	-	-		20	1,807	445	2,252
		GANTRY CRANE FDN		95.00 CY	-	-		107	9,538	2,350	11,888
		THERMAL ENERGY STORAGE (TES) TANK (#119)	U-0 3600000 GALLON, 120' DAI X 48' HIGH - CONCRETE	1,052.00 CY	-	-		1,184	105,616	26,025	131,641
		TURBINE PEDESTAL	U-1, 2004-005-SF-001	742.00 CY	-	-		1,336	119,189	29,370	148,559
		TURBINE PEDESTAL	U-2, 2004-005-SF-001	742.00 CY	-	-		1,336	119,189	29,370	148,559
		STEAM TURBINE GEN COLUMNS	U-3, 2004-005-SF-009	707.00 CY	-	-		1,273	113,567	27,984	141,551
		STEAM TURBINE ELEVATED SLAB	U-3, 2004-005-SF-011	778.00 CY	-	-		1,400	124,972	30,795	155,767
		CONCRETE						**18,938**	**1,689,989**	**416,437**	**2,106,427**

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.24.00	ARCHITECTURAL									
		ADMINISTRATION BUILDING	U-2, 70X90'X25' HIGH - 50% Steam Plant	78,750.00 CF	-	-		236	19,663	6,551	26,214
		ADMINISTRATION BUILDING	U-2, 70X90'X25' HIGH - 50% Other Plant	78,750.00 CF	-	-		236	19,663	6,551	26,214
		CHILLER BUILDING	U-0, 140'X45X'25' STEEL BLDG	157,500.00 CF	-	-		473	39,326	13,102	52,429
		PROCESS BUILDING	U-0, 40'X90'25' STEEL BLDG	90,000.00 CF	-	-		270	22,472	7,487	29,959
		TOOL STORAGE BUILDING	U-0, 40'X90'25' STEEL BLDG - 50% Steam Plant	45,000.00 CF	-	-		135	11,236	3,744	14,980
		TOOL STORAGE BUILDING	U-0, 40'X90'25' STEEL BLDG - 50% Other Plant	45,000.00 CF	-	-		135	11,236	3,744	14,980
		ELECTRICAL EQUIPMENT / CONTROL BUILDING	U-0, 30'X90'X25' - 50% Steam Plant	33,750.00 CF	-	-		101	8,427	2,808	11,235
		ELECTRICAL EQUIPMENT / CONTROL BUILDING	U-0, 30'X90'X25' - 50% Other Plant	33,750.00 CF	-	-		101	8,427	2,808	11,235
		WATER LAB BUILDING	U-0, 40'X35'X25'	35,000.00 CF	-	-		105	8,739	2,912	11,651
		FABRICATION SHOP BUILDING	U-0, 20'X40'X18'	14,400.00 CF	-	-		43	3,596	1,198	4,793
		SWITCHGEAR BUILDING	U-0, 5'X35'X18'	3,150.00 CF	-	-		9	787	262	1,049
		CT2 LCI W/PDC BUILDING	U-2, 12'X20'X9'	2,200.00 CF	-	-		7	549	183	732
		ELEVATOR		1.00 EA	-	-		200	15,988	4,554	20,542
		ARCHITECTURAL						**2,052**	**170,109**	**55,903**	**226,012**
	10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
		MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		500	39,970	11,385	51,355
		MISCELLANEOUS STRUCTURAL ITEM						**500**	**39,970**	**11,385**	**51,355**
	10.31.00	MECHANICAL EQUIPMENT									
		COMBUSTION TURBINE	U-1, GE PG7241FA C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS, INLET AIR FILTERS SILENCING & EVAP COOLERS , 180'X75'X31' INLET CHILLER COILS	854.00 TN	-	-		2,989	238,941	68,060	307,000
		COMBUSTION TURBINE	U-2, GE PG7241FA C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS, INLET AIR FILTERS SILENCING & EVAP COOLERS , 180'X75'X31' INLET CHILLER COILS	854.00 TN	-	-		2,989	238,941	68,060	307,000
		HEAT RECOVERY STEAM GENERATOR	U-1, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	603,227	171,822	775,050
		HEAT RECOVERY STEAM GENERATOR	U-2, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	603,227	171,822	775,050
		STEAM TURBINE GENERATOR	235 MW CONDENSING REHEAT TURBINE W STANDARD ACCESSORIES	465.00 TN	-	-		1,628	130,102	37,058	167,161
		CT INLET CHILLER	U-1	220.00 TN	-	-		446	35,613	10,144	45,757
		CT INLET CHILLER	U-2	220.00 TN	-	-		446	35,613	10,144	45,757
		AIR COMPRESSOR, CENTRIFUGAL	U-0, 2 @ 1335 SCFM STATION	9.00 TN	-	-		18	1,457	415	1,872
		NATURAL GAS COMPRESSOR	U-0, 3 @ 2300 HP EA INCL VOLUME TANKS AND AFTERCOOLERS	300.00 TN	-	-		608	48,564	13,833	62,396
		DEMIN WATER STORAGE TANK (#032)	U-0, 200000 GALLON, 38' DIA X 25' HIGH	28.00 TN	-	-		76	6,043	1,721	7,765
		RAW/FIRE WATER STORAGE TANK (#034)	U-0 730000 GALLON, 58' DIA X 40' HIGH - 50% Steam Plant	40.00 TN	-	-		108	8,634	2,459	11,093
		RAW/FIRE WATER STORAGE TANK (#034)	U-0 730000 GALLON, 58' DIA X 40' HIGH - 50% Other Plant	40.00 TN	-	-		108	8,634	2,459	11,093
		RO PERMEATE STORAGE TANK (#674)	U-0, 60000 GALLON, 25' DIA X 18' HIGH	11.00 TN	-	-		30	2,374	676	3,050
		AQUEOUS AMMONIA STORAGE TANK (#164)	U-0, 20000 GALLON,	6.00 TN	-	-		16	1,295	369	1,664
		WATER TREATMENT DEMINERALIZATION & CHEMICAL TREATMENT EQUIPMENT		30.00 TN	-	-		61	4,856	1,383	6,240
		GANTRY CRANE		225.00 TN	-	-		608	48,564	13,833	62,396
		BRIDGE CRANE		240.00 TN	-	-		621	49,643	14,140	63,783

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.31.00	MECHANICAL EQUIPMENT									
		CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.00 TN	-	-		11	863	246	1,109
		CIRC WTR PUMPS	U-3, 2 @ 65000 GPM & 100' TDH, 1750 HP	20.00 TN	-	-		54	4,317	1,230	5,546
		CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.50 TN	-	-		12	971	277	1,248
		CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-1	3.00 TN	-	-		12	959	273	1,233
		CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-2	3.00 TN	-	-		12	959	273	1,233
		BOILER FEED PUMPS	U-1, 2 @ 1350 GPM FOR HRSGS, 2150 HP	3.00 TN	-	-		12	959	273	1,233
		BOILER FEED PUMPS	U-2, 2 @ 1350 GPM FOR HRSGS, 2150 HP	5.00 TN	-	-		20	1,599	455	2,054
		CLOSED COOLING WATER PUMPS	U-3, 2 @ 7000 GPM @ 213 TDH, 550 HP	4.00 TN	-	-		16	1,279	364	1,643
		1.6 MW DIESEL GENERATOR		19.00 TN	-	-		76	6,075	1,731	7,806
		CCW HEAT EXCHANGER	U-3, 2 EA SS PLATE & FRAMED DESIGN, 7000 GPM	1.00 TN	-	-		5	400	114	514
		FUEL GAS PREHEAT	U-3, 2 SHELL & TUBE HT EX	1.00 TN	-	-		5	400	114	514
		BACKUP CIRC WTR MAKEUP PUMP	U-3, 1 , 40 HP	0.20 TN	-	-		1	80	23	103
		FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP	1.50 TN	-	-		8	600	171	770
		AUX ILIARY COOLING WATER	U-3, 1 @ 2400GPM	1.00 TN	-	-		5	400	114	514
		COOLING TOWER MAKEUP	U-3, 1 @ 4550 GPM & 65' TDH	1.00 TN	-	-		5	400	114	514
		DEMIN WTR PUMPS	U-3, 2 @ 290 GPM & 90' TDH, 20 HP	0.20 TN	-	-		1	80	23	103
		EVAP COOLERS BLEND WATER PUMPS	U-3, 2 @ 125 GPM & 148 TDH	1.00 TN	-	-		5	400	114	514
		PUMPS, FUEL OIL UNLOADING, FORWARDING, DIRTY CLEAN OIL TRANSFER	NOT INCLUDED	TN	-	-					
		RAW WATER RO SUPPLY PUMPS	U-0, 3 @ 270 GPM & 180' TDH, 15 HP	0.20 TN	-	-		1	80	23	103
		HRSG BLOWDOWN SUMP PUMPS	U-1, 1 @ 500 GPM & 50' TDH VERTICAL, 20 HP	0.20 TN	-	-		1	80	23	103
		HRSG BLOWDOWN SUMP PUMPS	U-2, 1 @ 500 GPM & 50' TDH VERTICAL, 20 HP	0.20 TN	-	-		1	80	23	103
		WASTEWATER SUMP PUMPS	U-1, 1 @ 600 GPM & 46' TDH VERTICAL, 20HP	0.20 TN	-	-		1	80	23	103
		WASTEWATER SUMP PUMPS	U-2, 1 @ 600 GPM & 46' TDH VERTICAL, 20HP	0.20 TN	-	-		1	80	23	103
		SERVICE WATER PUMPS	U-0, 1 @ 300 GPM & 145' TDH, 25 HP	0.20 TN	-	-		1	80	23	103
		VACUUM PUMPS	U-0, 2 @ 75 HP	0.60 TN	-	-		3	240	68	308
		CONDENSER	U-3, SURFACE CONDENSER 2 PASS	366.00 TN	-	-		741	59,248	16,876	76,124
		COOLING TOWER	U-3, 7-CELL INLINE WET WOOD COUNTERFLOW, MARLEY	897,600.00 CF	-	-		1,795	143,508	40,877	184,385
		MECHANICAL EQUIPMENT						28,646	2,289,943	652,264	2,942,208
	10.35.00	PIPING									
		PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT - 67% Steam Plant	222.00 TN	-	-		450	35,937	10,236	46,173
		PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT - 33% Other Plant	109.00 TN	-	-		221	17,645	5,026	22,671
		PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT - 67% Steam Plant	236.00 TN	-	-		478	38,203	10,882	49,085
		PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT - 33% Other Plant	116.00 TN	-	-		235	18,778	5,349	24,127
		FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Steam Plant	1.00 LT	-	-		40	3,198	911	4,108
		FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Other Plant	1.00 LT	-	-		40	3,198	911	4,108
		PIPING						1,463	116,958	33,314	150,272
	10.41.00	ELECTRICAL EQUIPMENT									
		TRANSFORMERS	U-1, U-2, 67% Steam Plant	261.00 TN	-	-		697	49,354	15,880	65,234
		TRANSFORMERS	U-1, U-2, 33% Other Plant	129.00 TN	-	-		345	24,394	7,849	32,242
		MISC ELECT EQUIPMENT	U-1, U-2, 33% Other Plant	60.00 TN	-	-		160	11,346	3,650	14,996
		MISC ELECT EQUIPMENT	U-1, U-2, 67% Steam Plant	122.00 TN	-	-		326	23,070	7,423	30,493
		OUTDOOR LIGHT POLE / FIXTURE	U-0	1.00 LT	-	-		150	10,616	3,416	14,031
		ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Steam Plant	1.00 LT	-	-		50	3,539	1,139	4,677
		ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Other Plant	1.00 LT	-	-		50	3,539	1,139	4,677
		ELECTRICAL EQUIPMENT						1,778	125,856	40,494	166,350
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
		CONDUIT	Steam Plant 67% U-1	30,150.00 LF	-	-		302	24,102	6,865	30,967
		CONDUIT	Other Plant 33% U-1	14,850.00 LF	-	-		149	11,871	3,381	15,252
		CONDUIT	Steam Plant 67% U-2	30,150.00 LF	-	-		302	24,102	6,865	30,967
		CONDUIT	Other Plant 33% U-2	14,850.00 LF	-	-		149	11,871	3,381	15,252
		CABLE TRAY	Steam Plant 67% U-1	1,675.00 LF	-	-		67	5,356	1,526	6,882
		CABLE TRAY	Other Plant 33% U-1	825.00 LF	-	-		33	2,638	751	3,389
		CABLE TRAY	Steam Plant 67% U-2	1,675.00 LF	-	-		67	5,356	1,526	6,882
		CABLE TRAY	Other Plant 33% U-2	825.00 LF	-	-		33	2,638	751	3,389
		RACEWAY, CABLE TRAY, & CONDUIT						1,100	87,934	25,047	112,981
	10.43.00	CABLE									
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-1	19,430.00 LF	-	-		194	15,532	4,424	19,957
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-1	9,570.00 LF	-	-		96	7,650	2,179	9,829
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-2	19,430.00 LF	-	-		194	15,532	4,424	19,957
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-2	9,570.00 LF	-	-		96	7,650	2,179	9,829
		COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-1	67,000.00 LF	-	-		335	26,780	7,628	34,408
		COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-1	33,000.00 LF	-	-		165	13,190	3,757	16,947
		COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-2	67,000.00 LF	-	-		335	26,780	7,628	34,408
		COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-2	33,000.00 LF	-	-		165	13,190	3,757	16,947
		CABLE						1,580	126,305	35,977	162,282
	10.44.00	CONTROL & INSTRUMENTATION									
		CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	7,994	2,277	10,271
		CONTROL & INSTRUMENTATION						100	7,994	2,277	10,271
		WHOLE PLANT DEMOLITION						**57,055**	**4,734,896**	**1,314,594**	**6,049,490**
18.00.00		**SCRAP VALUE**									
	18.10.00	MIXED STEEL									
		CARBON STEEL		-4,435.00 TN	-	(776,125)	-				(776,125)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-79.00 TN	-	(13,825)	-				(13,825)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-39.00 TN	-	(6,825)	-				(6,825)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-10.06 TN	-	(1,760)	-				(1,760)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-4.96 TN	-	(868)	-				(868)
		CARBON STEEL		-1,325.00 TN	-	(231,875)	-				(231,875)
		CARBON STEEL		-255.00 TN	-	(44,625)	-				(44,625)
		CARBON STEEL	COOLING TOWER	-350.00 TN	-	(61,250)	-				(61,250)
		CARBON STEEL		-230.00 TN	-	(40,250)	-				(40,250)
		CARBON STEEL		-782.00 TN	-	(136,850)	-				(136,850)
		CARBON STEEL		-1,939.00 TN	-	(339,325)	-				(339,325)
		CARBON STEEL	BUILDINGS	-154.00 TN	-	(26,950)	-				(26,950)
		CARBON STEEL	BUILDINGS	-1.87 TN	-	(327)	-				(327)
		CARBON STEEL	BUILDINGS	-60.16 TN	-	(10,528)	-				(10,528)
		CARBON STEEL	MISC ELECT EQUIPMENT	-122.00 TN	-	(21,350)	-				(21,350)
		CARBON STEEL	MISC ELECT EQUIPMENT	-60.00 TN	-	(10,500)	-				(10,500)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-261.00 TN	-	(91,350)	-	0			(91,350)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-129.00 TN	-	(45,150)	-	0			(45,150)
		MIXED STEEL				(1,859,734)		0			(1,859,734)
	18.30.00	COPPER									
		#2 SOLID COPPER / TUBING	BUS BAR	-0.67 TN	-	(4,117)	-				(4,117)
		#2 SOLID COPPER / TUBING	BUS BAR	-0.33 TN	-	(2,028)	-				(2,028)
		#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-				(9,760)
		#2 INSULATED COPPER WIRE		-2.00 TN	-	(4,880)	-				(4,880)
		COPPER				(20,785)					(20,785)
		SCRAP VALUE				**(1,880,519)**		**0**			**(1,880,519)**
21.00.00		**CIVIL WORK**									
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	713.00 CY	14,260	-					14,260
		HAULING TO RECYCLE FACILITY	CONCRETE PAVEMENT/SURFACES	624.00 CY	12,480						12,480

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	DEBRIS IS RECYCLED. NO DISPOSAL FEE	624.00 CY	12,480	-					12,480
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	4,611.00 CY	92,220	-					92,220
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	4,625.00 CY	92,500	-					92,500
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	309.00 CY	6,180	-					6,180
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	113.00 CY	2,260	-					2,260
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,319.00 CY	26,380	-					26,380
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	685.00 CY	13,700	-					13,700
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	2,120.00 CY	42,400	-					42,400
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	557.00 CY	11,140	-					11,140
		HAULING TO RECYCLE FACILITY	CONCRETE PAVED SURFACES DEBRIS IS RECYCLED. NO DISPOSAL FEE	624.00 CY	12,480	-					12,480
		HAULING			326,000						326,000
	21.21.00	MASS FILL									
		MASS FILL, COMMON EARTH 6 INCHES THICK	COVER DISTURBED AREAS OF SITE	12,907.00 CY	-	-	296,861	452	41,163	43,358	381,382
		MASS FILL					296,861	452	41,163	43,358	381,382
	21.47.00	LANDSCAPING									
		FINE GRADING, SEEDING & FERTILIZER		77,440.00 SY	-	-	37,946	3,717	269,082	59,288	366,316
		LANDSCAPING					37,946	3,717	269,082	59,288	366,316
	21.52.00	WASTE DISPOSAL									
		DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	1,550.00 CY	46,500	-					46,500
		WASTE DISPOSAL			46,500						46,500
		CIVIL WORK			372,500		334,807	4,169	310,245	102,647	1,120,198
22.00.00		CONCRETE									
	22.13.00	CONCRETE									
		FLOWABLE FILL, 1500 PSI	BURIED CIRCULATING WATER PIPES, 84" DIA X 2500LF	3,560.00 CY	-	-	427,200	1,780	134,977	22,837	585,015
		CONCRETE					427,200	1,780	134,977	22,837	585,015
		CONCRETE					427,200	1,780	134,977	22,837	585,015

APPENDIX B. CONCEPTUAL COST ESTIMATE — FERC ACCOUNTS

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	30611C

SAN DIEGO GAS & ELECTRIC
PALOMAR ENERGY CENTER
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Area	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
311	STRUCTURES AND IMPROVEMENTS	92,941	(26,950)	521,949	6,933	1,044,589	293,718	1,926,247
312	BOILER PLANT EQUIPMENT	117,026	(776,125)		20,604	3,244,452	749,563	3,334,916
314	TURBO GENERATOR UNITS	117,382	(293,125)	665,986	13,189	2,114,178	447,667	3,052,089
315	ACCESSORY ELECTRIC EQUIPMENT	7,842	(142,490)		3,333	497,309	121,988	484,650
316	MISCELLANEOUS POWER PLANT EQUIPMENT	2,868	(44,625)		1,079	167,391	39,449	165,083
341	OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS	49,313	(50,778)		3,067	506,211	131,398	636,144
342	OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES	17,385	(136,850)		2,389	379,225	86,704	346,465
344	OTHER PRODUCTION - GENERATORS	53,805	(339,325)		10,344	1,642,844	375,345	1,732,669
345	OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT	14,137	(70,251)		2,066	317,493	75,029	336,407

SAN DIEGO GAS & ELECTRIC
PALOMAR ENERGY CENTER
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Estimate Totals

Description	Amount	Totals	Hours
Labor	9,913,692		63,004
Material	1,187,936		
Subcontract	472,699		
Construction Equipment	2,320,861		
Scrap Value	(1,880,519)		
	12,014,669	12,014,669	
General Conditions			
Additional Labor Costs			
Site Overheads			
Other Construction Indirects			
		12,014,669	
Project Indirect Costs			
		12,014,669	
Contingency			
		12,014,669	
Escalation			
		12,014,669	
Total		**12,014,669**	

General Conditions, Indirect Costs and Contingency are allocated in the line items above.

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
311			**STRUCTURES AND IMPROVEMENTS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			PAVED SURFACES, 6 IN THICK	STEAM PLANT	3,744.00 SY	-	-		449	76,396	33,438	109,833
			CIVIL WORK						449	76,396	33,438	109,833
		10.22.00	CONCRETE									
			MISC FDNS	U-0 2004-005-SF, 50% Steam Plant	278.00 CY	-	-		313	53,414	11,084	64,497
			ADMINISTRATION/WAREHOUSE/SHOP WT BLDG	U-0, 130'X34'X2'+100'X11'X2' - 50% Steam Plant	205.00 CY	-	-		231	39,388	8,173	47,561
			TOOL STORAGE BLDG (#127)	50% Steam Plant	67.00 CY	-	-		75	12,873	2,671	15,544
			WATER LAB	U-0, 40'X35'X2'	104.00 CY	-	-		117	19,982	4,146	24,129
			FAB SHOP	U-0, 20'X40'X2'	59.00 CY	-	-		66	11,336	2,352	13,688
			CONCRETE						802	136,993	28,427	165,420
		10.24.00	ARCHITECTURAL									
			ADMINISTRATION BUILDING	U-2, 70X90'X25' HIGH - 50% Steam Plant	78,750.00 CF	-	-		236	37,631	10,558	48,189
			CHILLER BUILDING	U-0, 140'X45X'25' STEEL BLDG	157,500.00 CF	-	-		473	75,262	21,116	96,378
			PROCESS BUILDING	U-0, 40'X90'25' STEEL BLDG	90,000.00 CF	-	-		270	43,007	12,066	55,073
			TOOL STORAGE BUILDING	U-0, 40'X90'25' STEEL BLDG - 50% Steam Plant	45,000.00 CF	-	-		135	21,503	6,033	27,537
			ELECTRICAL EQUIPMENT / CONTROL BUILDING	U-0, 30'X90'X25' - 50% Steam Plant	33,750.00 CF	-	-		101	16,128	4,525	20,653
			WATER LAB BUILDING	U-0, 40'X35'X25'	35,000.00 CF	-	-		105	16,725	4,692	21,417
			FABRICATION SHOP BUILDING	U-0, 20'X40'X18'	14,400.00 CF	-	-		43	6,881	1,931	8,812
			ARCHITECTURAL						1,363	217,138	60,922	278,059
		10.41.00	ELECTRICAL EQUIPMENT									
			OUTDOOR LIGHT POLE / FIXTURE	U-0	1.00 LT	-	-		150	20,316	5,504	25,820
			ELECTRICAL EQUIPMENT						150	20,316	5,504	25,820
			WHOLE PLANT DEMOLITION						2,765	450,842	128,291	579,133
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	BUILDINGS	-154.00 TN	-	(26,950)	-				(26,950)
			MIXED STEEL				(26,950)					(26,950)
			SCRAP VALUE				(26,950)					(26,950)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	713.00 CY	18,096	-					18,096
			HAULING TO RECYCLE FACILITY	CONCRETE PAVED SURFACES DEBRIS IS RECYCLED. NO DISPOSAL FEE	624.00 CY	15,837	-					15,837
			HAULING			33,933						33,933
		21.21.00	MASS FILL									
			MASS FILL, COMMON EARTH 6 INCHES THICK	COVER DISTURBED AREAS OF SITE	12,907.00 CY	-	-	462,794	452	78,778	69,878	611,449
			MASS FILL					462,794	452	78,778	69,878	611,449
		21.47.00	LANDSCAPING									
			FINE GRADING, SEEDING & FERTILIZER		77,440.00 SY	-	-	59,156	3,717	514,969	95,550	669,674
			LANDSCAPING					59,156	3,717	514,969	95,550	669,674
		21.52.00	WASTE DISPOSAL									
			DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	1,550.00 CY	59,008	-					59,008
			WASTE DISPOSAL			59,008						59,008
			CIVIL WORK			92,941		521,949	4,169	593,746	165,427	1,374,064
			311 STRUCTURES AND IMPROVEMENTS			**92,941**	**(26,950)**	**521,949**	**6,933**	**1,044,589**	**293,718**	**1,926,247**
312			**BOILER PLANT EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			HRSG / STACK FDN	U-1, 2004-005-SF-025	948.00 CY	-	-		1,067	182,145	37,796	219,941
			HRSG / STACK FDN	U-2, 2004-005-SF-025	948.00 CY	-	-		1,067	182,145	37,796	219,941
			HRSG EAST AREA MAT	U-1, 2004-005-SF-028	197.00 CY	-	-		222	37,851	7,854	45,705
			HRSG EAST AREA MAT	U-2, 2004-005-SF-028	160.00 CY	-	-		180	30,742	6,379	37,121
			AQUEOUS AMMONIA STORAGE TANK AND UNLOADING AREA FDNS	U-2, 2004-005-SF-037	196.00 CY	-	-		221	37,659	7,814	45,473
			STG WEST AREA MAT	U-3, 2004-005-SF-061	49.00 CY	-	-		55	9,415	1,954	11,368
			TRAVELLING TOWER CONSTRUCTION CRANE FDN	U-0 2004-005-SF-074	117.00 CY	-	-		132	22,480	4,665	27,145

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.22.00	CONCRETE									
			STATIONARY TOWER CONSTRUCTION CRANE FDN	U-0 2004-005-SF-079	162.00 CY	-	-		182	31,126	6,459	37,585
			STG NORTH ARE MAT	U-0 2004-005-SF-080A	341.00 CY	-	-		384	65,518	13,595	79,114
			RO PERMEATE STORAGE TANK FDN	U-0 2004-005-SF-082	25.00 CY	-	-		28	4,803	997	5,800
			DEMIN WATER STORAGE TANK FDN	U-0 2004-005-SF-090	52.00 CY	-	-		59	9,991	2,073	12,064
			THERMAL ENERGY STORAGE (TES) TANK FDN	U-0 2004-005-SF-090	364.00 CY	-	-		410	69,937	14,513	84,450
			THERMAL ENERGY STORAGE (TES) TANK (#119)	U-0 3600000 GALLON, 120' DAI X 48' HIGH - CONCRETE	1,052.00 CY	-	-		1,184	202,127	41,943	244,069
			CONCRETE						5,187	885,937	183,838	1,069,775
		10.31.00	MECHANICAL EQUIPMENT									
			HEAT RECOVERY STEAM GENERATOR	U-1, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	1,154,454	276,913	1,431,367
			HEAT RECOVERY STEAM GENERATOR	U-2, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	1,154,454	276,913	1,431,367
			DEMIN WATER STORAGE TANK (#032)	U-0, 200000 GALLON, 38' DIA X 25' HIGH	28.00 TN	-	-		76	11,566	2,774	14,340
			RAW/FIRE WATER STORAGE TANK (#034)	U-0 730000 GALLON, 58' DIA X 40' HIGH - 50% Steam Plant	40.00 TN	-	-		108	16,523	3,963	20,486
			RO PERMEATE STORAGE TANK (#674)	U-0, 60000 GALLON, 25' DIA X 18' HIGH	11.00 TN	-	-		30	4,544	1,090	5,634
			AQUEOUS AMMONIA STORAGE TANK (#164)	U-0, 20000 GALLON,	6.00 TN	-	-		16	2,478	594	3,073
			WATER TREATMENT DEMINERALIZATION & CHEMICAL TREATMENT EQUIPMENT		30.00 TN	-	-		61	9,294	2,229	11,523
			BOILER FEED PUMPS	U-1, 2 @ 1350 GPM FOR HRSGS, 2150 HP	3.00 TN	-	-		12	1,836	440	2,276
			BOILER FEED PUMPS	U-2, 2 @ 1350 GPM FOR HRSGS, 2150 HP	5.00 TN	-	-		20	3,060	734	3,794
			DEMIN WTR PUMPS	U-3, 2 @ 290 GPM & 90' TDH, 20 HP	0.20 TN	-	-		1	153	37	190
			RAW WATER RO SUPPLY PUMPS	U-0, 3 @ 270 GPM & 180' TDH, 15 HP	0.20 TN	-	-		1	153	37	190
			MECHANICAL EQUIPMENT						15,416	2,358,515	565,724	2,924,239
			WHOLE PLANT DEMOLITION						20,604	3,244,452	749,563	3,994,014
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-4,435.00 TN	-	(776,125)	-				(776,125)
			MIXED STEEL				(776,125)					(776,125)
			SCRAP VALUE				(776,125)					(776,125)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	4,611.00 CY	117,026	-					117,026
			HAULING			117,026						117,026
			CIVIL WORK			117,026						117,026
			312 BOILER PLANT EQUIPMENT			**117,026**	**(776,125)**		**20,604**	**3,244,452**	**749,563**	**3,334,916**
314			**TURBO GENERATOR UNITS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			STEAM TURBINE GEN FDN BASE MAT	U-3, 2004-005-SF-009	1,322.00 CY	-	-		1,487	254,003	52,707	306,711
			COOLING TOWER FDN	U-3, 2004-005-SF-021A	1,544.00 CY	-	-		1,737	296,657	61,559	358,216
			STG ROTOR REMOVAL PLATFORM FDN	U-3, 2004-005-SF-030	35.00 CY	-	-		39	6,725	1,395	8,120
			COOLING TOWER CHEMICAL FEED BLDG AND UNLOADING CONTAINMENT FDNS	U-2, 2004-005-SF-060A & B	239.00 CY	-	-		269	45,920	9,529	55,449
			STEAM TURBINE GEN COLUMNS	U-3, 2004-005-SF-009	707.00 CY	-	-		1,273	217,344	45,100	262,444
			STEAM TURBINE ELEVATED SLAB	U-3, 2004-005-SF-011	778.00 CY	-	-		1,400	239,170	49,630	288,800
			CONCRETE						6,206	1,059,820	219,920	1,279,740
		10.31.00	MECHANICAL EQUIPMENT									
			STEAM TURBINE GENERATOR	235 MW CONDENSING REHEAT TURBINE W STANDARD ACCESSORIES	465.00 TN	-	-		1,628	248,989	59,724	308,713
			CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.00 TN	-	-		11	1,652	396	2,049
			CIRC WTR PUMPS	U-3, 2 @ 65000 GPM & 100' TDH, 1750 HP	20.00 TN	-	-		54	8,261	1,982	10,243
			CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.50 TN	-	-		12	1,859	446	2,305
			CLOSED COOLING WATER PUMPS	U-3, 2 @ 7000 GPM @ 213 TDH, 550 HP	4.00 TN	-	-		16	2,448	587	3,035
			CCW HEAT EXCHANGER	U-3, 2 EA SS PLATE & FRAMED DESIGN, 7000 GPM	1.00 TN	-	-		5	765	183	948
			BACKUP CIRC WTR MAKEUP PUMP	U-3, 1 , 40 HP	0.20 TN	-	-		1	153	37	190
			AUX ILIARY COOLING WATER	U-3, 1 @ 2400GPM	1.00 TN	-	-		5	765	183	948
			COOLING TOWER MAKEUP	U-3, 1 @ 4550 GPM & 65' TDH	1.00 TN	-	-		5	765	183	948
			VACUUM PUMPS	U-0, 2 @ 1500 CFM	0.20 TN	-	-		3	459	110	569

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.31.00	MECHANICAL EQUIPMENT									
			CONDENSER	U-3, SURFACE CONDENSER 2 PASS	366.00 TN	-	-		741	113,388	27,198	140,585
			COOLING TOWER	U-3, 7-CELL INLINE WET WOOD COUNTERFLOW, MARLEY	897,600.00 CF	-	-		1,795	274,646	65,878	340,523
			MECHANICAL EQUIPMENT						4,276	654,150	156,907	811,057
		10.35.00	PIPING									
			PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT - 67% Steam Plant	222.00 TN	-	-		450	68,776	16,497	85,273
			PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT - 67% Steam Plant	236.00 TN	-	-		478	73,113	17,537	90,651
			PIPING						927	141,890	34,034	175,924
			WHOLE PLANT DEMOLITION						11,409	1,855,859	410,862	2,266,721
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-1,325.00 TN	-	(231,875)	-				(231,875)
			CARBON STEEL	COOLING TOWER	-350.00 TN	-	(61,250)	-				(61,250)
			MIXED STEEL				(293,125)					(293,125)
			SCRAP VALUE				(293,125)					(293,125)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	4,625.00 CY	117,382	-					117,382
			HAULING			117,382						117,382
			CIVIL WORK			117,382						117,382
	22.00.00		CONCRETE									
		22.13.00	CONCRETE									
			FLOWABLE FILL, 1500 PSI	BURIED CIRCULATING WATER PIPES, 84" DIA X 2500LF	3,560.00 CY	-	-	665,986	1,780	258,319	36,805	961,111
			CONCRETE					665,986	1,780	258,319	36,805	961,111
			CONCRETE					665,986	1,780	258,319	36,805	961,111
			314 TURBO GENERATOR UNITS			**117,382**	**(293,125)**	**665,986**	**13,189**	**2,114,178**	**447,667**	**3,052,089**
315			**ACCESSORY ELECTRIC EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			STG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-3, 2004-005-SF-031	180.00 CY	-	-		203	34,584	7,177	41,761
			5 KV SWITCHGEAR MODULE FDN	U-3, 2004-005-SF-033	116.00 CY	-	-		131	22,288	4,625	26,913
			SWITCHGEAR BUILDING	U-0, 5'X35'X2'	13.00 CY	-	-		15	2,498	518	3,016
			CONCRETE						348	59,370	12,320	71,690
		10.24.00	ARCHITECTURAL									
			SWITCHGEAR BUILDING	U-0, 5'X35'X18'	3,150.00 CF	-	-		9	1,505	422	1,928
			CT2 LCI W/PDC BUILDING	U-2, 12'X20'X9'	2,200.00 CF	-	-		7	1,051	295	1,346
			ARCHITECTURAL						16	2,557	717	3,274
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	U-1, U-2, 67% Steam Plant	261.00 TN	-	-		697	94,454	25,592	120,046
			MISC ELECT EQUIPMENT	U-1, U-2, 67% Steam Plant	122.00 TN	-	-		326	44,151	11,963	56,114
			ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Steam Plant	1.00 LT	-	-		50	6,772	1,835	8,607
			ELECTRICAL EQUIPMENT						1,073	145,377	39,389	184,767
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT	Steam Plant 67% U-1	30,150.00 LF	-	-		302	46,126	11,064	57,190
			CONDUIT	Steam Plant 67% U-2	30,150.00 LF	-	-		302	46,126	11,064	57,190
			CABLE TRAY	Steam Plant 67% U-1	1,675.00 LF	-	-		67	10,250	2,459	12,709
			CABLE TRAY	Steam Plant 67% U-2	1,675.00 LF	-	-		67	10,250	2,459	12,709
			RACEWAY, CABLE TRAY, & CONDUIT						737	112,753	27,045	139,798
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-1	19,430.00 LF	-	-		194	29,726	7,130	36,856
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-2	19,430.00 LF	-	-		194	29,726	7,130	36,856
			COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-1	67,000.00 LF	-	-		335	51,251	12,293	63,545
			COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-2	67,000.00 LF	-	-		335	51,251	12,293	63,545
			CABLE						1,059	161,954	38,847	200,801
		10.44.00	CONTROL & INSTRUMENTATION									
			CONTROL & INSTRUMENTATION						100	15,299	3,670	18,969

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			CONTROL & INSTRUMENTATION						100	15,299	3,670	18,969
			WHOLE PLANT DEMOLITION						3,333	497,309	121,988	619,298
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-79.00 TN	-	(13,825)	-				(13,825)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-10.06 TN	-	(1,760)	-				(1,760)
			CARBON STEEL	BUILDINGS	-1.87 TN	-	(327)	-				(327)
			CARBON STEEL	MISC ELECT EQUIPMENT	-122.00 TN	-	(21,350)	-				(21,350)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-261.00 TN	-	(91,350)	-	0			(91,350)
			MIXED STEEL				(128,613)		0			(128,613)
		18.30.00	COPPER									
			#2 SOLID COPPER / TUBING	BUS BAR	-0.67 TN	-	(4,117)	-				(4,117)
			#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-				(9,760)
			COPPER				(13,877)					(13,877)
			SCRAP VALUE				(142,490)		0			(142,490)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	309.00 CY	7,842	-					7,842
			HAULING			7,842						7,842
			CIVIL WORK			7,842						7,842
			315 ACCESSORY ELECTRIC EQUIPMENT			**7,842**	**(142,490)**		**3,333**	**497,309**	**121,988**	**484,650**
316			**MISCELLANEOUS POWER PLANT EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			DIESEL GENERATOR FDN	U-0, 12'X26'X1.5'	18.00 CY	-	-		20	3,458	718	4,176
			GANTRY CRANE FDN		95.00 CY	-	-		107	18,253	3,788	22,041
			CONCRETE						127	21,711	4,505	26,217
		10.24.00	ARCHITECTURAL									
			ELEVATOR		1.00 EA	-	-		200	30,598	7,339	37,937
			ARCHITECTURAL						200	30,598	7,339	37,937
		10.31.00	MECHANICAL EQUIPMENT									
			AIR COMPRESSOR, CENTRIFUGAL	U-0, 2 @ 1335 SCFM STATION	9.00 TN	-	-		18	2,788	669	3,457
			GANTRY CRANE		225.00 TN	-	-		608	92,941	22,293	115,234
			1.6 MW DIESEL GENERATOR		19.00 TN	-	-		76	11,627	2,789	14,416
			FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP	1.50 TN	-	-		8	1,147	275	1,423
			HRSG BLOWDOWN SUMP PUMPS	U-1, 1 @ 500 GPM & 50' TDH VERTICAL, 20 HP	0.20 TN	-	-		1	153	37	190
			HRSG BLOWDOWN SUMP PUMPS	U-2, 1 @ 500 GPM & 50' TDH VERTICAL, 20 HP	0.20 TN	-	-		1	153	37	190
			SERVICE WATER PUMPS	U-0, 1 @ 300 GPM & 145' TDH, 25 HP	0.20 TN	-	-		1	153	37	190
			MECHANICAL EQUIPMENT						712	108,962	26,136	135,099
		10.35.00	PIPING									
			FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Steam Plant	1.00 LT	-	-		40	6,120	1,468	7,587
			PIPING						40	6,120	1,468	7,587
			WHOLE PLANT DEMOLITION						1,079	167,391	39,449	206,840
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-255.00 TN	-	(44,625)	-				(44,625)
			MIXED STEEL				(44,625)					(44,625)
			SCRAP VALUE				(44,625)					(44,625)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	113.00 CY	2,868	-					2,868
			HAULING			2,868						2,868
			CIVIL WORK			2,868						2,868

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			316 MISCELLANEOUS POWER PLANT EQUIPMENT			**2,868**	**(44,625)**		**1,079**	**167,391**	**39,449**	**165,083**
341			**OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			PAVED SURFACES, 6 IN THICK	OTHER PRODUCTION	3,744.00 SY	-	-		449	76,396	33,438	109,833
			CIVIL WORK						449	76,396	33,438	109,833
		10.22.00	CONCRETE									
			FINGER RACK AREA MAT	U-1, 2004-005-SF-047A	248.00 CY	-	-		279	47,650	9,888	57,537
			FINGER RACK AREA MAT	U-2, 2004-005-SF-047B	236.00 CY	-	-		266	45,344	9,409	54,753
			WEST AREA MAT @ TUR-CTG1-01	U-1, 2004-005-SF-053	142.00 CY	-	-		160	27,283	5,661	32,945
			WEST AREA MAT @ TUR-CTG2-01	U-2, 2004-005-SF-054	143.00 CY	-	-		161	27,475	5,701	33,177
			MISC FDNS	U-0 2004-005-SF, 50% Steam Plant	278.00 CY	-	-		313	53,414	11,084	64,497
			ADMINISTRATION/WAREHOUSE/SHOP WT BLDG	U-0, 130'X34'X2'+100'X11'X2' - 50% Steam Plant	205.00 CY	-	-		231	39,388	8,173	47,561
			TOOL STORAGE BLDG (#127)	50% Other Plant	67.00 CY	-	-		75	12,873	2,671	15,544
			CONCRETE						1,484	253,427	52,588	306,015
		10.24.00	ARCHITECTURAL									
			ADMINISTRATION BUILDING	U-2, 70X90'X25' HIGH - 50% Other Plant	78,750.00 CF	-	-		236	37,631	10,558	48,189
			TOOL STORAGE BUILDING	U-0, 40'X90'25' STEEL BLDG - 50% Other Plant	45,000.00 CF	-	-		135	21,503	6,033	27,537
			ELECTRICAL EQUIPMENT / CONTROL BUILDING	U-0, 30'X90'X25' - 50% Other Plant	33,750.00 CF	-	-		101	16,128	4,525	20,653
			ARCHITECTURAL						473	75,262	21,116	96,378
		10.31.00	MECHANICAL EQUIPMENT									
			BRIDGE CRANE		230.00 TN	-	-		621	95,006	22,789	117,795
			MECHANICAL EQUIPMENT						621	95,006	22,789	117,795
		10.35.00	PIPING									
			FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Other Plant	1.00 TN	-	-		40	6,120	1,468	7,587
			PIPING						40	6,120	1,468	7,587
			WHOLE PLANT DEMOLITION						3,067	506,211	131,398	637,609
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-230.00 TN	-	(40,250)	-				(40,250)
			CARBON STEEL	BUILDINGS	-60.16 TN	-	(10,528)	-				(10,528)
			MIXED STEEL				(50,778)					(50,778)
			SCRAP VALUE				(50,778)					(50,778)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,319.00 CY	33,476	-					33,476
			HAULING TO RECYCLE FACILITY	CONCRETE PAVED SURFACES DEBRIS IS RECYCLED. NO DISPOSAL FEE	624.00 CY	15,837	-					15,837
			HAULING			49,313						49,313
			CIVIL WORK			49,313						49,313
			341 OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS			**49,313**	**(50,778)**		**3,067**	**506,211**	**131,398**	**636,144**
342			**OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			FUEL GAS COMPRESSOR FDN	U-0, 2004-005-SF-040	161.00 CY	-	-		181	30,934	6,419	37,353
			RAW WATER STORAGE TANK FDN	U-0 2004-005-SF-089	57.00 CY	-	-		64	10,952	2,273	13,224
			CHILLER PREFAB FLDG	U-3, S200	467.00 CY	-	-		525	89,727	18,619	108,346
			CONCRETE						771	131,613	27,311	158,924
		10.31.00	MECHANICAL EQUIPMENT									
			CT INLET CHILLER	U-1	220.00 TN	-	-		446	68,157	16,348	84,505
			CT INLET CHILLER	U-2	220.00 TN	-	-		446	68,157	16,348	84,505
			NATURAL GAS COMPRESSOR	U-0, 3 @ 2300 HP EA INCL VOLUME TANKS AND AFTERCOOLERS	300.00 TN	-	-		608	92,941	22,293	115,234

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.31.00	MECHANICAL EQUIPMENT									
			RAW/FIRE WATER STORAGE TANK (#034)	U-0 730000 GALLON, 58' DIA X 40' HIGH - 50% Other Plant	40.00 TN	-	-		108	16,523	3,963	20,486
			FUEL GAS PREHEAT	U-3, 2 SHELL & TUBE HT EX	1.00 TN	-	-		5	765	183	948
			EVAP COOLERS BLEND WATER PUMPS	U-3, 2 @ 125 GPM & 148 TDH	1.00 TN	-	-		5	765	183	948
			PUMPS, FUEL OIL UNLOADING, FORWARDING, DIRTY CLEAN OIL TRANSFER	NOT INCLUDED	TN	-	-					
			WASTEWATER SUMP PUMPS	U-1, 1 @ 600 GPM & 46' TDH VERTICAL, 20HP	0.20 TN	-	-		1	153	37	190
			WASTEWATER SUMP PUMPS	U-2, 1 @ 600 GPM & 46' TDH VERTICAL, 20HP	0.20 TN	-	-		1	153	37	190
			MECHANICAL EQUIPMENT						1,619	247,612	59,394	307,006
			WHOLE PLANT DEMOLITION						2,389	379,225	86,704	465,930
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-782.00 TN	-	(136,850)	-				(136,850)
			MIXED STEEL				(136,850)					(136,850)
			SCRAP VALUE				(136,850)					(136,850)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	685.00 CY	17,385	-					17,385
			HAULING			17,385						17,385
			CIVIL WORK			17,385						17,385
			342 OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES			**17,385**	**(136,850)**		**2,389**	**379,225**	**86,704**	**346,465**
344			**OTHER PRODUCTION - GENERATORS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			COMBUSTION TURBINE AREA MAT @ NORTH END	U-1, 2004-005-SF-005	33.00 CY	-	-		37	6,340	1,316	7,656
			COMBUSTION TURBINE AREA MAT @ NORTH END	U-2, 2004-005-SF-005	30.00 CY	-	-		34	5,764	1,196	6,960
			PEECC & ACCESSORY MODULE FDN	U-1, 2004-005-SF-006	389.00 CY	-	-		438	74,741	15,509	90,250
			COMBUSTION TURBINE AREA MAT AT EAST END	U-1, 2004-005-SF-007A	63.00 CY	-	-		71	12,105	2,512	14,616
			COMBUSTION TURBINE AREA MAT AT EAST END	U-2, 2004-005-SF-007B	121.00 CY	-	-		136	23,248	4,824	28,073
			TURBINE PEDESTAL	U-1, 2004-005-SF-001	742.00 CY	-	-		1,336	228,103	47,333	275,436
			TURBINE PEDESTAL	U-2, 2004-005-SF-001	742.00 CY	-	-		1,336	228,103	47,333	275,436
			CONCRETE						3,387	578,405	120,023	698,428
		10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
			MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		500	76,494	18,348	94,843
			MISCELLANEOUS STRUCTURAL ITEM						500	76,494	18,348	94,843
		10.31.00	MECHANICAL EQUIPMENT									
			COMBUSTION TURBINE	U-1, GE PG7241FA C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS, INLET AIR FILTERS SILENCING & EVAP COOLERS , 180'X75'X31' INLET CHILLER COILS	854.00 TN	-	-		2,989	457,284	109,686	566,970
			COMBUSTION TURBINE	U-2, GE PG7241FA C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS, INLET AIR FILTERS SILENCING & EVAP COOLERS , 180'X75'X31' INLET CHILLER COILS	854.00 TN	-	-		2,989	457,284	109,686	566,970
			CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-1	3.00 TN	-	-		12	1,836	440	2,276
			CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-2	3.00 TN	-	-		12	1,836	440	2,276
			MECHANICAL EQUIPMENT						6,002	918,239	220,253	1,138,492
		10.35.00	PIPING									
			PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT - 33% Other Plant	109.00 TN	-	-		221	33,768	8,100	41,868
			PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT - 33% Other Plant	116.00 TN	-	-		235	35,937	8,620	44,557
			PIPING						456	69,706	16,720	86,425
			WHOLE PLANT DEMOLITION						10,344	1,642,844	375,345	2,018,189
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		18.10.00	MIXED STEEL									
			CARBON STEEL		-1,939.00 TN	-	(339,325)	-				(339,325)
			MIXED STEEL				(339,325)					(339,325)
			SCRAP VALUE				(339,325)					(339,325)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	2,120.00 CY	53,805	-					53,805
			HAULING			53,805						53,805
			CIVIL WORK			53,805						53,805
			344 OTHER PRODUCTION - GENERATORS			**53,805**	**(339,325)**		**10,344**	**1,642,844**	**375,345**	**1,732,669**
345			**OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			CTG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-1, 2004-005-SF-029A	250.00 CY	-	-		281	48,034	9,967	58,001
			CTG STEP-UP TRANSFORMER AND AUX TRNSFORMER FDNS	U-2, 2004-005-SF-029B	241.00 CY	-	-		271	46,305	9,609	55,913
			EXCITATION XFMR & ISOLATION XFMR	U-2, 2004-005-SF-034	49.00 CY	-	-		55	9,415	1,954	11,368
			NEW CT2 LCI W/PDC BUILDING	U-2, 12'X20'X2'	17.00 CY	-	-		19	3,266	678	3,944
			CONCRETE						627	107,020	22,207	129,227
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	U-1, U-2, 33% Other Plant	129.00 TN	-	-		345	46,684	12,649	59,333
			MISC ELECT EQUIPMENT	U-1, U-2, 33% Other Plant	60.00 TN	-	-		160	21,714	5,883	27,597
			ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Other Plant	1.00 LT	-	-		50	6,772	1,835	8,607
			ELECTRICAL EQUIPMENT						555	75,170	20,367	95,537
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT	Other Plant 33% U-1	14,850.00 LF	-	-		149	22,719	5,449	28,168
			CONDUIT	Other Plant 33% U-2	14,850.00 LF	-	-		149	22,719	5,449	28,168
			CABLE TRAY	Other Plant 33% U-1	825.00 LF	-	-		33	5,049	1,211	6,260
			CABLE TRAY	Other Plant 33% U-2	825.00 LF	-	-		33	5,049	1,211	6,260
			RACEWAY, CABLE TRAY, & CONDUIT						363	55,535	13,321	68,856
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-1	9,570.00 LF	-	-		96	14,641	3,512	18,153
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-2	9,570.00 LF	-	-		96	14,641	3,512	18,153
			COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-1	33,000.00 LF	-	-		165	25,243	6,055	31,298
			COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-2	33,000.00 LF	-	-		165	25,243	6,055	31,298
			CABLE						521	79,768	19,134	98,902
			WHOLE PLANT DEMOLITION						2,066	317,493	75,029	392,522
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-39.00 TN	-	(6,825)	-				(6,825)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-4.96 TN	-	(868)	-				(868)
			CARBON STEEL	MISC ELECT EQUIPMENT	-60.00 TN	-	(10,500)	-				(10,500)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-129.00 TN	-	(45,150)	-	0			(45,150)
			MIXED STEEL				(63,343)		0			(63,343)
		18.30.00	COPPER									
			#2 SOLID COPPER / TUBING	BUS BAR	-0.33 TN	-	(2,028)	-				(2,028)
			#2 INSULATED COPPER WIRE		-2.00 TN	-	(4,880)	-				(4,880)
			COPPER				(6,908)					(6,908)
			SCRAP VALUE				(70,251)		0			(70,251)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	557.00 CY	14,137	-					14,137
			HAULING			14,137						14,137
			CIVIL WORK			14,137						14,137
			345 OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT			**14,137**	**(70,251)**		**2,066**	**317,493**	**75,029**	**336,407**

APPENDIX C. EXPLANATION OF VARIANACE FROM THE PREVIOUS COST STUDY

Cost Category	2021 Cost Estimate		2016 Cost Estimate		Delta	% of total cost	Discussion
Labor							
Labor - Direct		$5,180,119					
Labor Supervision	$310,807						The 2016 estimate included all demolition contractor costs in labor. The 2021 cost estimate broke out demolition contractor costs (subcontracts, construction equipment, general conditions - labor).
Show-up time	$103,602						
Construction Management	$559,453						
Field Office Expenses	$123,080						
Safety	$110,520						Average labor hourly labor cost increased by 18.2%.
Temporary Facilities	$84,086						
Mob/Demob	$88,617						
Small tools & consumables	$55,945						
General Liability Insurance	$55,945						
Constr Equip Mob/Demob	$144,008						
Legal Expenses/Claims	$13,091						
General Conditions (Indirect) - Labor		$1,649,154					
Subcontract		$372,500					
Construction Equipment		$1,440,078					
Labor Subtotal		**$8,641,851**		**$7,308,897**	**18.2%**	**11.1%**	
Material							
Material w/o freight	$762,007						The 2021 cost estimate for material is 1.5% less than 2016.
General Conditions -Freight on Material	$38,100						
Material Subtotal		**$800,107**		**$985,693**	**-18.8%**	**-1.5%**	
Scrap							The 2021 cost estimate for scrap is 3.1% less than 2016. The main reasons are: (a) cost for scrap mixed steel increased by 114%. Cost for mixed steel in 2021 based on a 12-month average is $175 per ton as compared to 2016 based on a 3-month average of $87 per ton (b) cost for copper decreased by -98.6%. Cost for copper in 2021 was broken out into #2 copper (solid) and #2 (insulated wire) as compared to 2016 which was based on #1 copper (solid bright)
Mixed Steel	-$1,859,734		-$847,989				
Copper	-$20,785		-$1,508,560				
Subtotal Scrap Value		**-$1,880,519**		**-$1,941,577**	**-3.1%**	**0.5%**	
Subtotal - Direct & Indirect Demolition		**$7,561,439**		**$6,353,013**	**19.0%**	**10.1%**	
Contractor G&A and Profit							
Contractor G&A	$620,864		$365,445		69.9%		Contractor G&A is 69.9 percent higher. 2021 estimate is 7% of labor, equipment, and materials. 2016 estimate was 5% of labor and materials.
Contractor Profit	$886,951		$663,567		33.7%		Contractor Profit is 33.7 percent higher. 2021 estimate is 10% of labor, equipment, and materials. 2016 estimate was 8% of labor and materials.
Subcontractor Contractor G&A and Profit		**$1,507,815**		**$1,029,012**	**46.5%**	**4.0%**	Increase in Contractor G&A and profit based on S&L database of actual demolition cost since 2016
Indirect							
Engineering	$231,000		$220,000 `				Higher cost due to SDGE internal costs in support of demolition as compared to 2016 where no SDGE internal costs were included
Construction Management	$0		$147,641				
Other SDGE Internal Costs	$902,000		$0				
Subtotal Indirect Costs		**$1,133,000**		**$367,641**	**208%**	**6.4%**	
Contingency		$1,812,416		$2,326,564	-22.1%	**-4.3%**	Contingency is less (-22.1%). Contingency in 2021 is 15% and not applied to scrap. Contingency in 2016 was 20% and applied to scrap.
Total		**$12,014,670**		**$10,076,230**	**19.2%**		

SCRAP	$/ton	tons	$/ton	tons	
Carbon Steel	$175	9,747	$87	9,747	Carbon steel scrap quantity is essentially the same
Steel/Copper mix (large transformers)	$350	390			Carbon/copper is for transformer.
# 1 Copper			$3,460	436	Copper in 2016 was based on solid bright (#1 grade) copper
#2 Copper	$6,145	1			Copper broken out into solid bar and insulated copper wire
#2 Insulated Copper Wire	$2,440	6			Lower copper quantity in 2021 due to copper included in steel/copper mix for larger transformers

Labor hours	63,004 hours	65,280 hours	-3.5%	The labor hours for the 2021 cost estimate are -3.5% less than the 2016 cost estimate. The main reason is that the 2021 cost estimate includes subcontracts (w/o labor hours), based on updared S&L standards, and no planting or seeding.

SL-016628.B_SDGE Decom(Miramar

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Miramar Energy Facility

Prepared by Sargent & Lundy

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Sargent & Lundy is one of the oldest and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Sargent & Lundy delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public and private sector clients in the power and energy, gas distribution, industrial, and government sectors.

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VERSION LOG

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ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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	April 4, 2022
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TABLES

APPENDIXES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
CT	Combustion Turbine
FERC	Federal Energy Regulatory Commission
G&A	General & Administrative
GSU	Generator Step-up Transformer
Owner	San Diego Gas & Electric Company
PCB	Polychlorinated biphenyl
S&L	Sargent & Lundy, L.L.C.
SCR	Selective Catalytic Reduction
SDG&E	San Diego Gas & Electric Company

EXECUTIVE SUMMARY

Sargent & Lundy was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for dismantlement and an estimate of the average service life of the facility's peer group for the Miramar Energy Facility (Miramar) in San Diego, California. The facility consists of two natural gas-fired combustion turbines in peaking service with a combined output rating of 92 MW. The work scope included updating the 2016 conceptual demolition cost estimate and the benchmarking analysis for the facility.

METHODOLOGY

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition costs and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by SDG&E. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment. A site walkdown was performed to conduct a review of the site for dismantlement and determine any specific site-unique requirements. This site walkdown was performed in 2016; however, recent discussions with the Owner and facility management confirmed that no significant modifications have occurred since that time. This information was used with unit cost factors developed by S&L based on industry data and our experience. Unit cost factors for concrete removal, steel removal, cutting costs etc. were developed from labor and material cost information. S&L estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

The benchmarking analysis considers publicly available data to determine the average service life of similar facilities.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning Miramar is shown in Table ES-1. The cost estimate broken into FERC accounts is shown in Table ES-2. All costs are in 2021 US dollars, and the total is the same in both tables, $1,773,720. The decommissioning costs are expected to increase by the end of service life of the asset due to escalation and other factors.

Table ES-1 — Miramar Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$933,065**	**–**
Labor	–	$658,508
Subcontracts	–	$48,240
Equipment	–	$192,047
Material	–	$34,270
General Conditions (Decommissioning Contractor Indirect) Costs	**$394,285**	**–**
Scrap Value	**($185,132)**	**–**
Subtotal Demolition Contractor Costs	**$1,142,218**	**–**
–Project Indirect Costs	**$376,000**	**–**
Engineering	–	$66,000
SDG&E Internal Costs	–	$310,000
Contingency Costs	**$**255,502	**–**
Total Demolition Costs	**$1,773,720**	**–**

Table ES-2 — Miramar Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
341	Other Production – Structures & Improvements	$327,239
342	Other Production – Fuel Holders, Producers and Accessories	$213,446
344	Other Production – Generators	$799,785
345	Other Production – Accessory Electric Equipment	$433,251
	General Conditions	Included Above
	Engineering	Included Above
	Contingency	Included Above
	Total Project Cost	**$1,773,720**

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of the Miramar Energy Facility (Miramar) and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate, report, and benchmarking analysis.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers over the years, the Sargent & Lundy Consulting Group has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineer services—including decommissioning cost estimation and average service life evaluation—for both global and domestic electric power assets.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations experience to support consulting services such as those performed for Miramar.

1.3. FACILITY DESCRIPTION

The Miramar Energy Facility in central San Diego consists of two simple-cycle GE LM6000 combustion turbines (CTs) firing only natural gas. The Miramar facility is used for peaking duty and is capable of generating 92 MW. The facility uses the latest generation of peaking turbines with water injection and selective catalytic reduction for nitrogen oxide (NOX) reduction. The Miramar CTs can be started remotely from the Palomar control room and are operated and maintained by personnel based out of the Palomar Energy Center. The first unit at Miramar went into service in 2005. The second turbine is a virtual replica of the first, with a capacity of approximately 46 MW of peaking energy and capacity for SDG&E's service territory. The second unit went into commercial operation in 2009.

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of deterministic and stochastic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, linear feet of piping, equipment, etc.). Stochastic methods were also used if quantitative information (e.g., fire lines and hydrants, miscellaneous electrical equipment, etc.) was unavailable.

The cost estimate was developed based on drawings, documents, and data provided by the Owner. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment.

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition cost and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates developed include both summaries and details for each type of work performed, indirect costs, and contingencies. The cost estimate database report lists costs by buildings, plant systems, and several other categories.

An inventory of plant piping, valves, equipment, HVAC ducts, concrete, galleries, cable tray, and other equipment was developed based on review of drawings and a site walkdown to conduct a review of the site for dismantlement and determine any specific site-unique requirements. This information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for concrete removal, steel removal, cutting costs, and other tasks were developed from labor and material cost information. S&L also estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal.

S&L worked from site general arrangement drawings and company documentation for the facilities, including information about any existing metal cleaning storage ponds, asbestos inventories, polychlorinated biphenyl (PCB) inventories, or sludge ponds. S&L relied on SDG&E to identify the location of environmental issues that need to be considered in the estimates, since S&L's scope of work excludes a detailed survey and testing program to identify such problems.

2.2. COST ESTIMATE SUMMARY

The summary of the cost estimate for decommissioning Miramar is shown in Table 2-1. The commercial and technical basis for the estimate is described in Section 4, and the detailed estimate is included in Appendix A. The summary breakdown into FERC accounts is shown in

Table 2-2, and the detailed allocation of FERC accounts is shown in Appendix B. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

The 2021 cost estimate format was changed to be consistent with S&L's current standards. The variance between the 2021 and 2016 cost estimate is shown in Appendix C.

Table 2-1 — Miramar Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$933,065**	**–**
Labor	–	$658,508
Subcontracts	–	$48,240
Equipment	–	$192,047
Material	–	$34,270
General Conditions (Decommissioning Contractor Indirect) Costs	**$394,285**	**–**
Scrap Value	**($185,132)**	**–**
Subtotal Demolition Contractor Costs	**$1,142,218**	**–**
–Project Indirect Costs	**$376,000**	**–**
Engineering	–	$66,000
SDG&E Internal Costs	–	$310,000
Contingency Costs	**$255,502**	**–**
Total Demolition Costs	**$1,773,720**	**–**

Table 2-2 — Miramar Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
341	Other Production – Structures & Improvements	$327,239
342	Other Production – Fuel Holders, Producers and Accessories	$213,446
344	Other Production – Generators	$799,785
345	Other Production – Accessory Electric Equipment	$433,251
	General Conditions	Included Above
	Engineering	Included Above
	Contingency	Included Above
	Total Project Cost	**$1,773,720**

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

1. **Construction Labor Wages**

   Craft labor rates (craft hourly rate) for the cost estimate are based on the prevailing wages for San Diego, California as published in "R.S. Means Labor Rates for the Construction Industry", (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for arrival time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from supplied engineering information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included for the decommissioning contractor indirect costs in the cost estimate as direct costs as noted for the following:

   - Labor supervision (additional compensation for labor foreman/supervisors)
   - Construction management
   - Field office expenses
   - Safety
   - Temporary facilities
   - Mobilization/demobilization
   - Legal expenses/claims
   - Small tools and consumables
   - General liability insurance
   - Construction equipment mobilization/demobilization
   - Freight on material
   - Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

- Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

5. Scrap

Scrap metals are a globally traded commodity and are part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions; as such, the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is estimated at $30/ton, resulting in the values shown in Table 3-1.

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
#2 Copper	6,145
#2 Insulated Copper Wire	2,440

Note: 1 ton = 2000 lbs.

6. Project Schedule

Miramar has a 12-month construction schedule.

7. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, the engineering required to place the plant in a safe shutdown, and any unique engineering required during demolition.
- SDG&E internal costs are included to cover costs in support of decommissioning the facility.

Table 3-2 – SDG&E Internal Costs in Support of Decommissioning

Activity	Estimated Cost
Labor to prepare the site for demolition, including drain oils, drain reagents, de-energization of the power buses, etc.	$120,000
Site security	$60,000
Subcontracts to remove chemicals, oils, and reagents from the site	$50,000
SDG&E project management, permitting, and procurement	$80,000
Total	**$310,000**

[1] www.americanrecycler.com

8. Escalation Rates

Not included.

9. Sales and Use Taxes

Sales and use taxes not included.

10. Contingency

- A 15% contingency is applied for labor, material, equipment, subcontracting, and indirect costs. General conditions (indirect demolition contractor costs) are allocated across labor, material, and equipment.
- There is no contingency on scrap value

11. Contract Basis for Estimate

The contracting strategy is a multiple lump sum for the estimate.

12. Assumptions

- The facility will be in safe-shutdown mode and ready for a decommissioning contractor to start work.
- All chemicals and lubricating oils will be removed from the facilities to be demolished by the utility before demolition.
- No extraordinary environmental costs for demolition will be needed.
- There will be no PCBs on site at the time of demolition.
- Switchyards within the plant boundaries are not part of the scope, nor are access roads to these facilities.
- All items above grade and to a depth of one foot including foundations will be demolished. Any other items buried more than one foot deep will remain in place.
- Underground piping will be abandoned in place.
- Underground piping larger than four feet in diameter will be filled with sand or slurry and capped at the ends to prevent collapse (none noted at this site). Non-metal pipe will be collapsed.
- All demolished materials are considered debris, except for organic combustibles and non-embedded metals which have scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- Handling on-site and off-site disposal of hazardous materials will be performed in compliance with methods approved by SDG&E's Environmental Services Department.
- All borrow (fill) material is assumed to be from offsite sources.

- Catalyst is assumed to be removed and returned to the original equipment manufacturer before demolition.

4. REFERENCES

1. Sargent & Lundy Cost Data Base
2. RSMeans Cost Data, 2021.
3. Engineering Drawings, Equipment Lists, and other information provided by San Diego Gas & Electric.
4. 2020 Form EIA-860 Data - Schedule 3, 'Generator Data' (Retired & Canceled Units Only)
5. Metal Scrap Values in the United States – West Coast (Zone 1) (www.americanrecycler.com).

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DISMANTLE MIRAMAR ENERGY FACILITY

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	30598C

Group	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00	WHOLE PLANT DEMOLITION				7,862	653,764	187,043	840,806
18.00.00	SCRAP VALUE		(185,132)		0	(7)	(1)	(185,140)
21.00.00	CIVIL WORK	48,240		34,270	52	4,752	5,005	92,267
	TOTAL DIRECT	48,240	(185,132)	34,270	7,914	658,508	192,047	747,933

Estimate Totals

Description	Amount	Totals	Hours
Labor	658,508		7,914
Material	34,270		
Subcontract	48,240		
Construction Equipment	192,047		
Scrap Value	(185,132)		
	747,933	**747,933**	
General Conditions			
Additional Labor Costs			
90-1 Labor Supervision	39,510		
90-2 Show-up Time	13,170		
90-3 Cost Due To OT 5-10's			
90-4 Cost Due To OT 6-10's			
90-5 Per Diem			
Site Overheads			
91-1 Construction Management	71,119		
91-2 Field Office Expenses	15,646		
91-3 Material&Quality Control			
91-4 Site Services			
91-5 Safety	14,050		
91-6 Temporary Facilities	10,689		
91-7 Temporary Utilities			
91-8 Mobilization/Demob.	11,265		
91-9 Legal Expenses/Claims	1,664		
Other Construction Indirects			
92-1 Small Tools & Consumables	7,112		
92-2 Scaffolding			
92-3 General Liability Insur.	7,112		
92-4 Constr. Equip. Mob/Demob	19,205		
92-5 Freight on Material	1,714		
92-6 Freight on Scrap			
92-7 Sales Tax			
92-8 Contractors G&A	74,953		
92-9 Contractors Profit	107,076		
	394,285	**1,142,218**	
Project Indirect Costs			
93-1 Engineering Services	66,000		
93-2 CM Support			
93-3 Start-Up/Commissioning			
93-4 Start-Up/Spare Parts			
93-5 Excess Liability Insur.			
93-6 Sales Tax On Indirects			
93-7 SDG&E Internal Costs	310,000		
93-8 EPC Fee			
	376,000	**1,518,218**	
Contingency			
94-1 Contingency on Const Eq	36,585		
94-3 Contingency on Material	6,315		
94-4 Contingency on Labor	148,966		
94-5 Contingency on Subcontr.	7,236		
94-6 Contingency on Scrap			
94-7 Contingency on Indirect	56,400		
	255,502	**1,773,720**	
Escalation			
96-1 Escalation on Const Equip			
96-3 Escalation on Material			
96-4 Escalation on Labor			
96-5 Escalation on Subcontract			
96-6 Escalation on Scrap			
96-7 Escalation on Indirects			
		1,773,720	
98 Interest During Constr			
		1,773,720	
Total		**1,773,720**	

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00		**WHOLE PLANT DEMOLITION**									
	10.21.00	**CIVIL WORK**									
		PAVED SURFACES, 6 IN THICK		3,010.00 SY		-	-	361	32,093	16,680	48,773
		CIVIL WORK						**361**	**32,093**	**16,680**	**48,773**
	10.22.00	**CONCRETE**									
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX SKID, U-1	58.00 CY		-	-	65	5,823	1,435	7,258
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX SKID, U-2	58.00 CY		-	-	65	5,823	1,435	7,258
		BUILDING/EQUIPMENT FOUNDATION/PAD	WATER WASH PAD, U-1	6.00 CY		-	-	7	602	148	751
		BUILDING/EQUIPMENT FOUNDATION/PAD	WATER WASH PAD, U-2	6.00 CY		-	-	7	602	148	751
		BUILDING/EQUIPMENT FOUNDATION/PAD	15KV SWITCHGEAR, U-1	12.00 CY		-	-	14	1,205	297	1,502
		BUILDING/EQUIPMENT FOUNDATION/PAD	15KV SWITCHGEAR, U-2	12.00 CY		-	-	14	1,205	297	1,502
		BUILDING/EQUIPMENT FOUNDATION/PAD	ENGINE REMOVAL, U-1	2.00 CY		-	-	2	201	49	250
		BUILDING/EQUIPMENT FOUNDATION/PAD	ENGINE REMOVAL, U-2	2.00 CY		-	-	2	201	49	250
		BUILDING/EQUIPMENT FOUNDATION/PAD	FUEL GAS FILTER SEPARATOR, U-1	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	FUEL GAS FILTER SEPARATOR, U-2	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT A, U-1	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT A, U-2	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT B, U-1	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT B, U-2	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT C, U-1	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT C, U-2	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT D, U-1	10.00 CY		-	-	11	1,004	247	1,251
		BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT D, U-2	10.00 CY		-	-	11	1,004	247	1,251
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMER 480V SWITCHGEAR, U-1	29.00 CY		-	-	33	2,911	717	3,629
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMER 480V SWITCHGEAR, U-2	29.00 CY		-	-	33	2,911	717	3,629
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX ELECTRIC ENCLOSURE, U-1	8.00 CY		-	-	9	803	198	1,001
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX ELECTRIC ENCLOSURE, U-2	8.00 CY		-	-	9	803	198	1,001
		BUILDING/EQUIPMENT FOUNDATION/PAD	STACK, U-1	36.00 CY		-	-	41	3,614	891	4,505
		BUILDING/EQUIPMENT FOUNDATION/PAD	STACK, U-2	36.00 CY		-	-	41	3,614	891	4,505
		BUILDING/EQUIPMENT FOUNDATION/PAD	CEMS, U-1	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	CEMS, U-2	3.00 CY		-	-	3	301	74	375
		BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA EVAPORATION SKID, U-1	8.00 CY		-	-	9	803	198	1,001
		BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA EVAPORATION SKID, U-2	8.00 CY		-	-	9	803	198	1,001
		BUILDING/EQUIPMENT FOUNDATION/PAD	EMERGENCY EYEWASH, U-1	1.00 CY		-	-	1	100	25	125
		BUILDING/EQUIPMENT FOUNDATION/PAD	EMERGENCY EYEWASH, U-2	1.00 CY		-	-	1	100	25	125
		BUILDING/EQUIPMENT FOUNDATION/PAD	BOP MCC, U-1	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	BOP MCC, U-2	4.00 CY		-	-	5	402	99	501
		BUILDING/EQUIPMENT FOUNDATION/PAD	TEMPERING AIR DUCT, U-1	13.00 CY		-	-	15	1,305	322	1,627
		BUILDING/EQUIPMENT FOUNDATION/PAD	TEMPERING AIR DUCT, U-2	13.00 CY		-	-	15	1,305	322	1,627
		BUILDING/EQUIPMENT FOUNDATION/PAD	FIN FAN COOLER, U-1	16.00 CY		-	-	18	1,606	396	2,002
		BUILDING/EQUIPMENT FOUNDATION/PAD	FIN FAN COOLER, U-2	16.00 CY		-	-	18	1,606	396	2,002
		BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TREATMENT, U-1	60.00 CY		-	-	68	6,024	1,484	7,508
		BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TREATMENT, U-2	60.00 CY		-	-	68	6,024	1,484	7,508
		BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER PUMP, U-1	29.00 CY		-	-	33	2,911	717	3,629
		BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER PUMP, U-2	29.00 CY		-	-	33	2,911	717	3,629
		BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER TANK, U-1	60.00 CY		-	-	68	6,024	1,484	7,508
		BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER TANK, U-2	60.00 CY		-	-	68	6,024	1,484	7,508
		BUILDING/EQUIPMENT FOUNDATION/PAD	SERVICE BUILDING AND CONTROL ROOM	33.00 CY		-	-	37	3,313	816	4,129
		BUILDING/EQUIPMENT FOUNDATION/PAD	AIR COMPRESSOR	13.00 CY		-	-	15	1,305	322	1,627
		BUILDING/EQUIPMENT FOUNDATION/PAD	BLACK START DIESEL GENERERATOR ENGINE	156.00 CY		-	-	176	15,662	3,859	19,521
		BUILDING/EQUIPMENT FOUNDATION/PAD	GAS COMPRESSOR	226.00 CY		-	-	254	22,689	5,591	28,280
		BUILDING/EQUIPMENT FOUNDATION/PAD	GAS COMPRESSOR COOLER	50.00 CY		-	-	56	5,020	1,237	6,257
		BUILDING/EQUIPMENT FOUNDATION/PAD	WAREHOUSE	110.00 CY		-	-	124	11,043	2,721	13,765
		TURBINE PEDESTAL	U-1	217.00 CY		-	-	391	34,857	8,589	43,446
		TURBINE PEDESTAL	U-2	217.00 CY		-	-	391	34,857	8,589	43,446
		CONCRETE						**2,273**	**202,838**	**49,982**	**252,820**
	10.24.00	**ARCHITECTURAL**									
		BUILDING	SERVICE BUILDING AND CONTROL ROOM, 50' X 30' X 14'	21,000.00 CF		-	-	63	5,243	1,747	6,990
		BUILDING	AIR COMPRESSOR BUILING, 245 SF	4,655.00 CF		-	-	14	1,162	387	1,550

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.24.00	ARCHITECTURAL									
		BUILDING	X 9' HIGH	4,655.00 CF	-	-		14	1,162	387	1,550
		BUILDING	GAS COMPRSSOR BUILING, 1485.33 SF X 9' HIGH	28,222.00 CF	-	-		85	7,047	2,348	9,395
		BUILDING	WAREHOUSE, 22' X 90' X 18' HIGH	35,640.00 CF	-	-		107	8,899	2,965	11,864
		ARCHITECTURAL						269	22,352	7,447	29,798
	10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
		MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		300	23,982	6,831	30,813
		MISCELLANEOUS STRUCTURAL ITEM						300	23,982	6,831	30,813
	10.31.00	MECHANICAL EQUIPMENT									
		COMBUSTION TURBINE	LM6000 PC-SPRINT W/GENERATOR AND ACCESSORIES, U-1	266.00 TN	-	-		931	74,424	21,199	95,623
		COMBUSTION TURBINE	LM6000 PC-SPRINT W/GENERATOR AND ACCESSORIES, U-2	266.00 TN	-	-		931	74,424	21,199	95,623
		TANKS AND SILOS	200,000 GAL, DEMINERALIZED WATER TANK, U-1	28.00 TN	-	-		76	6,043	1,721	7,765
		TANKS AND SILOS	200,000 GAL, DEMINERALIZED WATER TANK, U-2	28.00 TN	-	-		76	6,043	1,721	7,765
		TANKS AND SILOS	6,000 GAL, AQUEOUS AMMONIA TANK	3.00 TN	-	-		8	648	184	832
		MISCELLANEOUS EQUIPMENT	BLACK START DIESEL GENERATOR ENGINE, 625KV, NATURAL GAS	5.00 TN	-	-		14	1,079	307	1,387
		MISCELLANEOUS EQUIPMENT	SCR CASING, U-1	21.00 TN	-	-		57	4,533	1,291	5,824
		MISCELLANEOUS EQUIPMENT	SCR CAVITY DUCTWORK, U-1	33.00 TN	-	-		89	7,123	2,029	9,151
		MISCELLANEOUS EQUIPMENT	SCR CASING, U-2	21.00 TN	-	-		57	4,533	1,291	5,824
		MISCELLANEOUS EQUIPMENT	SCR CAVITY DUCTWORK, U-2	33.00 TN	-	-		89	7,123	2,029	9,151
		MISCELLANEOUS EQUIPMENT	CT AIR INTAKE SYSTEM, DUCTS & SILENCER, U-1	20.00 TN	-	-		54	4,317	1,230	5,546
		MISCELLANEOUS EQUIPMENT	CT AIR INTAKE SYSTEM, DUCTS & SILENCER, U-2	20.00 TN	-	-		54	4,317	1,230	5,546
		MISCELLANEOUS EQUIPMENT	CT LUBE OIL SYSTEM, INCL FIN FAN COOLER, U-1	3.00 TN	-	-		8	648	184	832
		MISCELLANEOUS EQUIPMENT	CT LUBE OIL SYSTEM, INCL FIN FAN COOLER, U-2	3.00 TN	-	-		8	648	184	832
		MISCELLANEOUS EQUIPMENT	CT LUBE GAS FUEL, COALESCING FILTER SKID, GAS COMPRESSOR	1.00 TN	-	-		3	216	61	277
		MISCELLANEOUS EQUIPMENT	DEMINERALIZED WATER TRANSFER PUMPS, U-1	0.30 TN	-	-		1	65	18	83
		MISCELLANEOUS EQUIPMENT	DEMINERALIZED WATER TRANSFER PUMPS, U-2	0.30 TN	-	-		1	65	18	83
		STEEL EXHAUST STACK	45 FT X 10 FT DIA, U-1	11.00 TN	-	-		22	1,781	507	2,288
		STEEL EXHAUST STACK	45 FT X 10 FT DIA, U-2	11.00 TN	-	-		22	1,781	507	2,288
		MECHANICAL EQUIPMENT						2,499	199,808	56,913	256,721
	10.35.00	PIPING									
		PIPING, VALVES AND HANGERS	UNIT 1	24.00 TN	-	-		49	3,885	1,107	4,992
		PIPING, VALVES AND HANGERS	UNIT 2	24.00 TN	-	-		49	3,885	1,107	4,992
		FIRE LINES AND HYDRANTS		1.00 LT	-	-		80	6,395	1,822	8,217
		PIPING						177	14,165	4,035	18,200
	10.41.00	ELECTRICAL EQUIPMENT									
		TRANSFORMERS	STATION AUXILARY TRANSFORMER, U-1	12.00 TN	-	-		32	2,563	730	3,293
		TRANSFORMERS	STATION AUXILARY TRANSFORMER, U-2	12.00 TN	-	-		32	2,563	730	3,293
		OUTDOOR LIGHT POLE / FIXTURE		1.00 LT	-	-		150	11,991	3,416	15,407
		MISCELLANEOUS ELECTRICAL EQUIPMENT	CONTROL ROOM EQUIPMENT	1.00 LT	-	-		100	7,994	2,277	10,271
		MISCELLANEOUS ELECTRICAL EQUIPMENT	GENERATOR BUS, TRANSFORMERS, MISC., U-1	63.00 TN	-	-		224	17,944	5,111	23,055
		MISCELLANEOUS ELECTRICAL EQUIPMENT	GENERATOR BUS, TRANSFORMERS, MISC., U-2	63.00 TN	-	-		224	17,944	5,111	23,055
		ELECTRICAL EQUIPMENT						763	60,999	17,375	78,375

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
		CONDUIT	U-1	12,000.00 LF	-	-		120	9,593	2,732	12,325
		CONDUIT	U-2	12,000.00 LF	-	-		120	9,593	2,732	12,325
		CABLE TRAY	U-1	2,500.00 LF	-	-		100	7,994	2,277	10,271
		CABLE TRAY	U-2	2,500.00 LF	-	-		100	7,994	2,277	10,271
		RACEWAY, CABLE TRAY, & CONDUIT						440	35,174	10,019	45,192
	10.43.00	CABLE									
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	U-1	4,500.00 LF	-	-		90	7,195	2,049	9,244
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	U-2	4,500.00 LF	-	-		90	7,195	2,049	9,244
		COPPER WIRE / CABLE - LOW VOLTAGE	U-1	25,000.00 LF	-	-		250	19,985	5,693	25,678
		COPPER WIRE / CABLE - LOW VOLTAGE	U-2	25,000.00 LF	-	-		250	19,985	5,693	25,678
		CABLE						680	54,359	15,484	69,843
	10.44.00	CONTROL & INSTRUMENTATION									
		CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	7,994	2,277	10,271
		CONTROL & INSTRUMENTATION						100	7,994	2,277	10,271
		WHOLE PLANT DEMOLITION						**7,862**	**653,764**	**187,043**	**840,806**
18.00.00		**SCRAP VALUE**									
	18.10.00	MIXED STEEL									
		CARBON STEEL		-104.60 TN	-	(18,305)	-	0	(1)	0	(18,306)
		CARBON STEEL		-717.00 TN	-	(125,475)	-	0	(6)	(1)	(125,482)
		CARBON STEEL	BUILDINGS	-31.00 TN	-	(5,425)	-	0	0	0	(5,425)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-31.00 TN	-	(5,425)	-	0			(5,425)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-15.00 TN	-	(2,625)	-	0			(2,625)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	TRANSFORMERS, GENERATORS, U1	-12.00 TN	-	(4,200)	-	0			(4,200)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	TRANSFORMERS, GENERATORS, U2	-12.00 TN	-	(4,200)	-	0			(4,200)
		MIXED STEEL				(165,655)		0	(7)	(1)	(165,664)
	18.30.00	COPPER									
		#2 SOLID COPPER / TUBING	BUS BAR	-0.39 TN	-	(2,397)	-				(2,397)
		#2 INSULATED COPPER WIRE	U-1	-3.50 TN	-	(8,540)	-	0			(8,540)
		#2 INSULATED COPPER WIRE	U-2	-3.50 TN	-	(8,540)	-	0			(8,540)
		COPPER				(19,477)		0			(19,477)
		SCRAP VALUE				**(185,132)**		**0**	**(7)**	**(1)**	**(185,140)**
21.00.00		**CIVIL WORK**									
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	158.00 CY	3,160	-					3,160
		HAULING TO RECYCLE FACILITY	CONCRETE PAVED SURFACES DEBRIS IS RECYCLED. NO DISPOSAL FEE	502.00 CY	10,040	-					10,040
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	590.00 CY	11,800	-					11,800
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	906.00 CY	18,120	-					18,120
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	106.00 CY	2,120	-					2,120
		HAULING			45,240						45,240
	21.21.00	MASS FILL									
		MASS FILL, COMMON EARTH 6 INCHES THICK	8940 SY	1,490.00 CY	-	-	34,270	52	4,752	5,005	44,027
		MASS FILL					34,270	52	4,752	5,005	44,027
	21.52.00	WASTE DISPOSAL									
		DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	100.00 CY	3,000	-					3,000
		WASTE DISPOSAL			3,000						3,000

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		CIVIL WORK			**48,240**		**34,270**	**52**	**4,752**	**5,005**	**92,267**

APPENDIX B. CONCEPTUAL ESTIMATE OF COST — FERC ACCOUNT

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	30598C

SAN DIEGO GAS & ELECTRIC
MIRAMAR ENERGY FACILITY
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Area	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
341	OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS	23,907	(5,425)	62,131	940	181,285	65,340	327,239
342	OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES	17,414	(18,305)		914	176,311	38,025	213,446
344	OTHER PRODUCTION - GENERATORS	26,741	(125,475)		3,959	731,492	167,027	799,785
345	OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT	3,129	(35,927)		2,102	376,505	89,544	433,251

Estimate Totals

Description	Amount	Totals	Hours
Labor	1,465,593		7.914
Material	62,131		
Subcontract	71,191		
Construction Equipment	359,937		
Process Equipment	(185,132)		
	1,773,720	**1,773,720**	
General Conditions			
Additional Labor Costs			
Site Overheads			
Other Construction Indirects			
		1,773,720	
Project Indirect Costs			
		1,773,720	
Contingency			
		1,773,720	
Escalation			
		1,773,720	
Total		**1,773,720**	

General Conditions, Indirect Costs and Contingency are allocated in the line items above.

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
341			**OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			PAVED SURFACES, 6 IN THICK		3,010.00 SY	-	-		361	71,426	31,262	102,688
			CIVIL WORK						361	71,426	31,262	102,688
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	EMERGENCY EYEWASH, U-1	1.00 CY	-	-		1	223	46	270
			BUILDING/EQUIPMENT FOUNDATION/PAD	EMERGENCY EYEWASH, U-2	1.00 CY	-	-		1	223	46	270
			BUILDING/EQUIPMENT FOUNDATION/PAD	SERVICE BUILDING AND CONTROL ROOM	33.00 CY	-	-		37	7,374	1,530	8,904
			BUILDING/EQUIPMENT FOUNDATION/PAD	AIR COMPRESSOR	13.00 CY	-	-		15	2,905	603	3,508
			BUILDING/EQUIPMENT FOUNDATION/PAD	WAREHOUSE	110.00 CY	-	-		124	24,579	5,100	29,679
			CONCRETE						178	35,304	7,326	42,630
		10.24.00	ARCHITECTURAL									
			BUILDING	SERVICE BUILDING AND CONTROL ROOM, 50' X 30' X 14'	21,000.00 CF	-	-		63	11,670	3,274	14,944
			BUILDING	AIR COMPRESSOR BUILING, 245 SF X 9' HIGH	4,655.00 CF	-	-		14	2,587	726	3,313
			BUILDING	GAS COMPRSSOR BUILING, 1485.33 SF X 9' HIGH	28,222.00 CF	-	-		85	15,683	4,400	20,084
			BUILDING	WAREHOUSE, 22' X 90' X 18' HIGH	35,640.00 CF	-	-		107	19,806	5,557	25,363
			ARCHITECTURAL						269	49,746	13,957	63,703
		10.35.00	PIPING									
			FIRE LINES AND HYDRANTS		1.00 LT	-	-		80	14,233	3,414	17,647
			PIPING						80	14,233	3,414	17,647
			WHOLE PLANT DEMOLITION						888	170,709	55,959	226,669
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	BUILDINGS	-31.00 TN	-	(5,425)	-	0	(1)	0	(5,426)
			MIXED STEEL				(5,425)		0	(1)	0	(5,426)
			SCRAP VALUE				(5,425)		0	(1)	0	(5,426)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	158.00 CY	4,663	-					4,663
			HAULING TO RECYCLE FACILITY	CONCRETE PAVED SURFACES DEBRIS IS RECYCLED. NO DISPOSAL FEE	502.00 CY	14,817	-					14,817
			HAULING			19,480						19,480
		21.21.00	MASS FILL									
			MASS FILL, COMMON EARTH 6 INCHES THICK	8940 SY	1,490.00 CY	-	-	62,131	52	10,576	9,381	82,088
			MASS FILL					62,131	52	10,576	9,381	82,088
		21.52.00	WASTE DISPOSAL									
			DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	100.00 CY	4,427	-					4,427
			WASTE DISPOSAL			4,427						4,427
			CIVIL WORK			23,907		62,131	52	10,576	9,381	105,996
			341 OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS			**23,907**	**(5,425)**	**62,131**	**940**	**181,285**	**65,340**	**327,239**
342			**OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA EVAPORATION SKID, U-1	8.00 CY	-	-		9	1,788	371	2,158
			BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA EVAPORATION SKID, U-2	8.00 CY	-	-		9	1,788	371	2,158
			BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TREATMENT, U-1	60.00 CY	-	-		68	13,407	2,782	16,188
			BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TREATMENT, U-2	60.00 CY	-	-		68	13,407	2,782	16,188
			BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER PUMP, U-1	29.00 CY	-	-		33	6,480	1,345	7,824
			BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER PUMP, U-2	29.00 CY	-	-		33	6,480	1,345	7,824
			BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER TANK, U-1	60.00 CY	-	-		68	13,407	2,782	16,188
			BUILDING/EQUIPMENT FOUNDATION/PAD	DEMINERALIZED WATER TANK, U-2	60.00 CY	-	-		68	13,407	2,782	16,188
			BUILDING/EQUIPMENT FOUNDATION/PAD	GAS COMPRESSOR	226.00 CY	-	-		254	50,498	10,479	60,977
			BUILDING/EQUIPMENT FOUNDATION/PAD	GAS COMPRESSOR COOLER	50.00 CY	-	-		56	11,172	2,318	13,490

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			CONCRETE						664	131,831	27,356	159,186
		10.31.00	MECHANICAL EQUIPMENT									
			TANKS AND SILOS	200,000 GAL, DEMINERALIZED WATER TANK, U-1	28.00 TN	-	-		76	13,451	3,226	16,677
			TANKS AND SILOS	200,000 GAL, DEMINERALIZED WATER TANK, U-2	28.00 TN	-	-		76	13,450	3,226	16,677
			MISCELLANEOUS EQUIPMENT	DEMINERALIZED WATER TRANSFER PUMPS, U-1	0.30 TN	-	-		1	144	35	179
			MISCELLANEOUS EQUIPMENT	DEMINERALIZED WATER TRANSFER PUMPS, U-2	0.30 TN	-	-		1	144	35	179
			MECHANICAL EQUIPMENT						153	27,189	6,522	33,711
		10.35.00	PIPING									
			PIPING, VALVES AND HANGERS	UNIT 1	24.00 TN	-	-		49	8,647	2,074	10,721
			PIPING, VALVES AND HANGERS	UNIT 2	24.00 TN	-	-		49	8,647	2,074	10,721
			PIPING						97	17,293	4,148	21,442
			WHOLE PLANT DEMOLITION						914	176,313	38,026	214,339
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-104.60 TN	-	(18,305)	-	0	(2)	0	(18,307)
			MIXED STEEL				(18,305)		0	(2)	0	(18,307)
			SCRAP VALUE				(18,305)		0	(2)	0	(18,307)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	590.00 CY	17,414	-					17,414
			HAULING			17,414						17,414
			CIVIL WORK			17,414						17,414
			342 OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES			**17,414**	**(18,305)**		**914**	**176,311**	**38,025**	**213,446**
344			**OTHER PRODUCTION - GENERATORS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX SKID, U-1	58.00 CY	-	-		65	12,960	2,689	15,649
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX SKID, U-2	58.00 CY	-	-		65	12,960	2,689	15,649
			BUILDING/EQUIPMENT FOUNDATION/PAD	WATER WASH PAD, U-1	6.00 CY	-	-		7	1,341	278	1,619
			BUILDING/EQUIPMENT FOUNDATION/PAD	WATER WASH PAD, U-2	6.00 CY	-	-		7	1,341	278	1,619
			BUILDING/EQUIPMENT FOUNDATION/PAD	ENGINE REMOVAL, U-1	2.00 CY	-	-		2	447	93	540
			BUILDING/EQUIPMENT FOUNDATION/PAD	ENGINE REMOVAL, U-2	2.00 CY	-	-		2	447	93	540
			BUILDING/EQUIPMENT FOUNDATION/PAD	FUEL GAS FILTER SEPARATOR, U-1	4.00 CY	-	-		5	894	185	1,079
			BUILDING/EQUIPMENT FOUNDATION/PAD	FUEL GAS FILTER SEPARATOR, U-2	4.00 CY	-	-		5	894	185	1,079
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT A, U-1	4.00 CY	-	-		5	894	185	1,079
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT A, U-2	4.00 CY	-	-		5	894	185	1,079
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT B, U-1	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT B, U-2	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT C, U-1	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT C, U-2	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT D, U-1	10.00 CY	-	-		11	2,234	464	2,698
			BUILDING/EQUIPMENT FOUNDATION/PAD	OUTLET DUCT D, U-2	10.00 CY	-	-		11	2,234	464	2,698
			BUILDING/EQUIPMENT FOUNDATION/PAD	STACK, U-1	36.00 CY	-	-		41	8,044	1,669	9,713
			BUILDING/EQUIPMENT FOUNDATION/PAD	STACK, U-2	36.00 CY	-	-		41	8,044	1,669	9,713
			BUILDING/EQUIPMENT FOUNDATION/PAD	CEMS, U-1	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	CEMS, U-2	3.00 CY	-	-		3	670	139	809
			BUILDING/EQUIPMENT FOUNDATION/PAD	TEMPERING AIR DUCT, U-1	13.00 CY	-	-		15	2,905	603	3,508
			BUILDING/EQUIPMENT FOUNDATION/PAD	TEMPERING AIR DUCT, U-2	13.00 CY	-	-		15	2,905	603	3,507
			BUILDING/EQUIPMENT FOUNDATION/PAD	FIN FAN COOLER, U-1	16.00 CY	-	-		18	3,575	742	4,317
			BUILDING/EQUIPMENT FOUNDATION/PAD	FIN FAN COOLER, U-2	16.00 CY	-	-		18	3,575	742	4,317
			BUILDING/EQUIPMENT FOUNDATION/PAD	BLACK START DIESEL GENERERATOR ENGINE	156.00 CY	-	-		176	34,857	7,233	42,090
			TURBINE PEDESTAL	U-1	217.00 CY	-	-		391	77,579	16,098	93,677
			TURBINE PEDESTAL	U-2	217.00 CY	-	-		391	77,579	16,098	93,677
			CONCRETE						1,312	260,623	54,081	314,704
		10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
			MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		300	53,375	12,803	66,178

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			MISCELLANEOUS STRUCTURAL ITEM						300	53,375	12,803	66,178
		10.31.00	MECHANICAL EQUIPMENT									
			COMBUSTION TURBINE	LM6000 PC-SPRINT W/GENERATOR AND ACCESSORIES, U-1	266.00 TN	-	-		931	165,640	39,731	205,372
			COMBUSTION TURBINE	LM6000 PC-SPRINT W/GENERATOR AND ACCESSORIES, U-2	266.00 TN	-	-		931	165,640	39,731	205,372
			TANKS AND SILOS	6,000 GAL, AQUEOUS AMMONIA TANK	3.00 TN	-	-		8	1,441	346	1,787
			MISCELLANEOUS EQUIPMENT	BLACK START DIESEL GENERATOR ENGINE, 625KV, NATURAL GAS	5.00 TN	-	-		14	2,402	576	2,978
			MISCELLANEOUS EQUIPMENT	SCR CASING, U-1	21.00 TN	-	-		57	10,088	2,420	12,508
			MISCELLANEOUS EQUIPMENT	SCR CAVITY DUCTWORK, U-1	33.00 TN	-	-		89	15,852	3,802	19,655
			MISCELLANEOUS EQUIPMENT	SCR CASING, U-2	21.00 TN	-	-		57	10,088	2,420	12,508
			MISCELLANEOUS EQUIPMENT	SCR CAVITY DUCTWORK, U-2	33.00 TN	-	-		89	15,852	3,802	19,655
			MISCELLANEOUS EQUIPMENT	CT AIR INTAKE SYSTEM, DUCTS & SILENCER, U-1	20.00 TN	-	-		54	9,608	2,304	11,912
			MISCELLANEOUS EQUIPMENT	CT AIR INTAKE SYSTEM, DUCTS & SILENCER, U-2	20.00 TN	-	-		54	9,607	2,305	11,912
			MISCELLANEOUS EQUIPMENT	CT LUBE OIL SYSTEM, INCL FIN FAN COOLER, U-1	3.00 TN	-	-		8	1,441	346	1,787
			MISCELLANEOUS EQUIPMENT	CT LUBE OIL SYSTEM, INCL FIN FAN COOLER, U-2	3.00 TN	-	-		8	1,441	346	1,787
			MISCELLANEOUS EQUIPMENT	CT LUBE GAS FUEL, COALESCING FILTER SKID, GAS COMPRESSOR	1.00 TN	-	-		3	480	115	596
			STEEL EXHAUST STACK	45 FT X 10 FT DIA, U-1	11.00 TN	-	-		22	3,963	951	4,914
			STEEL EXHAUST STACK	45 FT X 10 FT DIA, U-2	11.00 TN	-	-		22	3,963	951	4,914
			MECHANICAL EQUIPMENT						2,347	417,508	100,145	517,653
			WHOLE PLANT DEMOLITION						3,959	731,505	167,029	898,535
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-717.00 TN	-	(125,475)	-	0	(14)	(2)	(125,491)
			MIXED STEEL				(125,475)		0	(14)	(2)	(125,491)
			SCRAP VALUE				(125,475)		0	(14)	(2)	(125,491)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	906.00 CY	26,741	-					26,741
			HAULING			26,741						26,741
			CIVIL WORK			26,741						26,741
			344 OTHER PRODUCTION - GENERATORS			26,741	(125,475)		3,959	731,492	167,027	799,785
345			OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	15KV SWITCHGEAR, U-1	12.00 CY	-	-		14	2,681	556	3,238
			BUILDING/EQUIPMENT FOUNDATION/PAD	15KV SWITCHGEAR, U-2	12.00 CY	-	-		14	2,681	556	3,238
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMER 480V SWITCHGEAR, U-1	29.00 CY	-	-		33	6,480	1,345	7,824
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMER 480V SWITCHGEAR, U-2	29.00 CY	-	-		33	6,480	1,345	7,824
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX ELECTRIC ENCLOSURE, U-1	8.00 CY	-	-		9	1,788	371	2,158
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX ELECTRIC ENCLOSURE, U-2	8.00 CY	-	-		9	1,788	371	2,158
			BUILDING/EQUIPMENT FOUNDATION/PAD	BOP MCC, U-1	4.00 CY	-	-		5	894	185	1,079
			BUILDING/EQUIPMENT FOUNDATION/PAD	BOP MCC, U-2	4.00 CY	-	-		5	894	185	1,079
			CONCRETE						119	23,685	4,915	28,600
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	STATION AUXILARY TRANSFORMER, U-1	12.00 TN	-	-		32	5,705	1,368	7,073
			TRANSFORMERS	STATION AUXILARY TRANSFORMER, U-2	12.00 TN	-	-		32	5,705	1,368	7,073
			OUTDOOR LIGHT POLE / FIXTURE		1.00 LT	-	-		150	26,688	6,401	33,089
			MISCELLANEOUS ELECTRICAL EQUIPMENT	CONTROL ROOM EQUIPMENT	1.00 LT	-	-		100	17,792	4,268	22,059
			MISCELLANEOUS ELECTRICAL EQUIPMENT	GENERATOR BUS, TRANSFORMERS, MISC., U-1	63.00 TN	-	-		224	39,937	9,579	49,516
			MISCELLANEOUS ELECTRICAL EQUIPMENT	GENERATOR BUS, TRANSFORMERS, MISC., U-2	63.00 TN	-	-		224	39,937	9,579	49,516
			ELECTRICAL EQUIPMENT						763	135,762	32,565	168,327
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									

SAN DIEGO GAS & ELECTRIC
MIRAMAR ENERGY FACILITY
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT	U-1	12,000.00 LF	-	-		120	21,350	5,121	26,471
			CONDUIT	U-2	12,000.00 LF	-	-		120	21,350	5,121	26,471
			CABLE TRAY	U-1	2,500.00 LF	-	-		100	17,792	4,268	22,059
			CABLE TRAY	U-2	2,500.00 LF	-	-		100	17,792	4,268	22,059
			RACEWAY, CABLE TRAY, & CONDUIT						440	78,283	18,777	97,061
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	U-1	4,500.00 LF	-	-		90	16,013	3,841	19,853
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	U-2	4,500.00 LF	-	-		90	16,013	3,841	19,853
			COPPER WIRE / CABLE - LOW VOLTAGE	U-1	25,000.00 LF	-	-		250	44,479	10,669	55,148
			COPPER WIRE / CABLE - LOW VOLTAGE	U-2	25,000.00 LF	-	-		250	44,479	10,669	55,148
			CABLE						680	120,983	29,020	150,003
		10.44.00	CONTROL & INSTRUMENTATION									
			CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	17,792	4,268	22,059
			CONTROL & INSTRUMENTATION						100	17,792	4,268	22,059
			WHOLE PLANT DEMOLITION						2,102	376,505	89,544	466,049
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-31.00 TN	-	(5,425)	-	0			(5,425)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-15.00 TN	-	(2,625)	-	0			(2,625)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	TRANSFORMERS, GENERATORS, U1	-12.00 TN	-	(4,200)	-	0			(4,200)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	TRANSFORMERS, GENERATORS, U2	-12.00 TN	-	(4,200)	-	0			(4,200)
			MIXED STEEL				(16,450)		0			(16,450)
		18.30.00	COPPER									
			#2 SOLID COPPER / TUBING	BUS BAR	-0.39 TN	-	(2,397)	-				(2,397)
			#2 INSULATED COPPER WIRE	U-1	-3.50 TN	-	(8,540)	-	0			(8,540)
			#2 INSULATED COPPER WIRE	U-2	-3.50 TN	-	(8,540)	-	0			(8,540)
			COPPER				(19,477)		0			(19,477)
			SCRAP VALUE				(35,927)		0			(35,927)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	106.00 CY	3,129	-					3,129
			HAULING			3,129						3,129
			CIVIL WORK			3,129						3,129
			345 OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT			**3,129**	**(35,927)**		**2,102**	**376,505**	**89,544**	**433,251**

APPENDIX C. EXPLANATION OF VARIANCE FROM THE PREVIOUS COST STUDY

Cost Category	2021 Cost Estimate		2016 Cost Estimate		Delta	% of total cost	Discussion
Labor							
Labor - Direct		$658,508					
Labor Supervision	$39,510						The 2016 estimate included all demolition contractor costs in labor. The 2021 cost estimate broke out demolition contractor costs (subcontracts, construction equipment, general conditions - labor).
Show-up time	$13,170						
Construction Management	$71,119						
Field Office Expenses	$15,646						
Safety	$14,050						Average labor hourly labor cost increased by 15.2%.
Temporary Facilities	$10,689						
Mob/Demob	$11,265						
Small tools & consumables	$7,112						
General Liability Insurance	$7,112						
Constr Equip Mob/Demob	$19,205						
Legal Expenses/Claims	$1,664						
General Conditions (Indirect) - Labor		$210,542					
Subcontract		$48,240					
Construction Equipment		$192,047					
Labor Subtotal		**$1,109,337**		**$963,225**	**15.2%**	**8.2%**	
Material							
Material w/o freight	$34,270						The 2021 cost estimate for material is 66.4% less than 2016.
General Conditions -Freight on Material	$1,714						
Material Subtotal		**$35,984**		**$107,046**	**-66.4%**	**-4.0%**	
Scrap							The 2021 cost estimate for scrap is 28.3% less than 2016. The main reasons are: (a) cost for scrap mixed steel increased by 114%. Cost for mixed steel in 2021 based on a 12-month average is $175 per ton as compared to 2016 based on a 3-month average of $87 per ton (b) cost for copper decreased by -98.6%. Cost for copper in 2021 was broken out into #2 copper (solid) and #2 (insulated wire) as compared to 2016 which was based on #1 copper (solid bright)
Mixed Steel	-$165,655		-$84,493				
Copper	-$19,477		-$173,692				
Subtotal Scrap Value		**-$185,132**		**-$258,185**	**-28.3%**	**4.1%**	
Subtotal - Direct & Indirect Demolition		**$960,189**		**$812,086**	**18.2%**	**8.3%**	
Contractor G&A and Profit							
Contractor G&A	$74,953		$48,161		55.6%		Contractor G&A is 55.6% higher. 2021 estimate is 7% of labor, equipment, and materials. 2016 estimate was 5% of labor and materials.
Contractor Profit	$107,076		$85,622		25.1%		Contractor Profit is 25.1% higher. 2021 estimate is 10% of labor, equipment, and materials. 2016 estimate was 8% of labor and materials.
Subcontractor Contractor G&A and Profit		**$182,029**		**$133,783**	**36.1%**	**2.7%**	Increase in Contractor G&A and profit based on S&L database of actual demolition cost since 2016
Indirect							
Engineering	$66,000		$60,000 `				Higher cost due to SDGE internal costs in support of demolition as compared to 2016 where no SDGE internal costs were included
Construction Management	$0		$18,917				
Other SDGE Internal Costs	$310,000		$0				
Subtotal Indirect Costs		**$376,000**		**$78,917**	**376%**	**16.7%**	
Contingency		$255,502		$308,231	-17.1%	**-3.0%**	Contingency is less (-17.1%). Contingency in 2021 is 15% and not applied to scrap. Contingency in 2016 was 20% and applied to scrap.
Total		**$1,773,720**		**$1,333,017**	**33.1%**		

SCRAP	$/ton	tons	$/ton	tons		
Carbon Steel	$175	899	$87	971		Carbon steel scrap quantity is essentially the same
Steel/Copper mix (large transformers)	$350	24				Carbon/copper is for transformer.
# 1 Copper			$3,460	50		Copper in 2016 was based on solid bright (#1 grade) copper
#2 Copper	$6,145	0.39				Copper broken out into solid bar and insulated copper wire
#2 Insulated Copper Wire	$2,440	7				Lower copper quantity in 2021 due to copper included in steel/copper mix for larger transformers

Labor hours	7,914 hours	8,515 hours	-7.1%		The labor hours for the 2021 cost estimate are 7.1% less than the 2016 cost estimate. The main reason is that the 2021 cost estimate includes subcontracts (w/o labor hours), based on updated S&L standards

SL-016628.C_SDGE Decom(Cuyamaca)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Cuyamaca Peak Energy Plant

Prepared by Sargent & Lundy

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Sargent & Lundy is one of the oldest and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Sargent & Lundy delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public and private sector clients in the power and energy, gas distribution, industrial, and government sectors.

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VERSION LOG

Version	Issue Date	Sections Modified
Draft v0	December 3, 2021	Initial Issue
Final	April 4, 2022	Executive Summary, Section 2

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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	April 4, 2022
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FIGURES AND TABLES

APPENDIXES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
CT	combustion turbine
Cuyamaca	Cuyamaca Peak Energy Plant
FERC	Federal Energy Regulatory Commission
G&A	general and administrative
Owner	San Diego Gas & Electric Company
PCB	polychlorinated biphenyl
PWPS	Pratt & Whitney Power Systems
S&L	Sargent & Lundy, L.L.C.
SCR	selective catalytic reduction
SDG&E	San Diego Gas & Electric Company

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of the Cuyamaca Peak Energy Plant (Cuyamaca) and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate and a benchmarking analysis for the facility.

METHODOLOGY

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition costs and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by SDG&E. These drawings and documents were used to estimate the building foundation sizes, building volumes, and quantities of steel, piping, valves, and other equipment. A site walkdown was performed to conduct a review of the site for dismantlement and determine any specific site-unique requirements. This site walkdown was performed in 2016; however, recent discussions with the Owner and facility management confirmed that no significant modifications have occurred since that time. This information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for concrete removal, steel removal, cutting costs, etc. were developed from labor and material cost information. S&L estimated the quantities of metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

The benchmarking analysis considers publicly available data to determine the average service life of similar facilities.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning Cuyamaca is shown in Table ES-1. The cost estimate broken into FERC accounts is shown in Table ES-2. All costs are in 2021 U.S. dollars, and the total is the same in both tables: $1,128,058. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

Table ES-1 — Cuyamaca Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$541,510**	**–**
Labor	–	$336,471
Subcontracts	–	$15,000
Equipment	–	$98,799
Material	–	$91,240
General Condition (Decommissioning Contractor Indirect) Costs	**$218,492**	**–**
Scrap Value	**($110,494)**	**–**
Subtotal Demolition Contractor Costs	**$649,508**	**–**
Project Indirect Costs	**$317,000**	**–**
Engineering	–	$47,000
SDG&E Internal Costs	–	$270,000
Contingency Costs	**$161,550**	**–**
Total Demolition Costs	**$1,128,058**	**–**

Table ES-2 — Cuyamaca Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
341	Other Production – Structures and Improvements	$459,273
342	Other Production – Fuel Holders, Producers, and Accessories	$69,713
344	Other Production – Generators	$333,484
345	Other Production – Accessory Electric Equipment	$265,588
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$1,128,058**

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of the Cuyamaca Peak Energy Plant (Cuyamaca) and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate report and a benchmarking analysis.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers over the years, the Sargent & Lundy Consulting Group has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineer services, including decommissioning cost estimation and average service life evaluation, for both global and domestic electric power assets.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations experience to support consulting services such as those performed for Cuyamaca.

1.3. FACILITY DESCRIPTION

Cuyamaca consists of two simple-cycle combustion turbine (CT) generators located in the El Cajon area of San Diego, California. The units began service in May 2002. In January 2012, the ownership of the plant was transferred from Calpeak Power to SDG&E.

The CTs are Pratt & Whitney Power Systems (PWPS) Model FT8® SWIFTPAC® aeroderivative turbines. Each CT is rated for 25 MW and is equipped with dry low-NOx (DLN) burners.

The Cuyamaca plant includes one 71 MVA electric generator mounted on a common shaft with the two CTs, and a selective catalytic reduction (SCR) unit in an exhaust duct common to both CTs to further reduce NOx emissions to the permitted level. Additionally, the CTs are equipped with a fogging system that cools the inlet air and boosts the power output of the CTs.

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of deterministic and stochastic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, linear feet of piping, equipment, etc.). Stochastic methods were also used if quantities information (e.g., fire lines and hydrants, miscellaneous electrical equipment, etc.) was unavailable.

The cost estimate was developed based on drawings, documents, and data provided by the Owner. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment.

The S&L methodology for developing the cost estimate consist of three elements: (1) S&L experience in developing plant demolition cost and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates include both summaries and details for each type of work performed, indirect costs, and contingencies. The cost estimate database report lists costs by buildings, plant systems, and several other categories.

An inventory of plant piping, valves, equipment, HVAC ducts, concrete, galleries, cable tray, and other equipment was developed based on a review of drawings and a site walkdown to conduct a review of the site for dismantlement and determine any specific site-unique requirements. This information was used with unit cost factors developed by S&L based on industry data and S&L experience. Unit cost factors for concrete removal, steel removal, cutting costs, and other tasks were developed from labor and material cost information. S&L also estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

S&L worked from site general arrangement drawings and company documentation for the facilities, including information about any existing metal cleaning storage ponds, asbestos inventories, polychlorinated biphenyl (PCB) inventories, or sludge ponds. S&L relied on SDG&E to identify the location of environmental issues that need to be considered in the estimates, since S&L's scope of work excludes a detailed survey and testing program to identify such problems.

2.2. COST ESTIMATE SUMMARY

The summary of the cost estimate for decommissioning Cuyamaca is shown in Table 2-1. The commercial and technical basis for the estimate is described in Section 3, and the detailed estimate is included in Appendix A. The summary breakdown into FERC accounts is shown in

Table 2-2, and the detailed allocation of FERC accounts is shown in Appendix B. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

The 2021 cost estimate format was changed to be consistent with S&L's current standards. The variance between the 2021 and 2016 cost estimate is shown in Appendix C.

Table 2-1 — Cuyamaca Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$541,510**	**–**
Labor	–	$336,471
Subcontracts	–	$15,000
Equipment	–	$98,799
Material	–	$91,240
General Condition (Decommissioning Contractor Indirect) Costs	**$218,492**	**–**
Scrap Value	**($110,494)**	**–**
Subtotal Demolition Contractor Costs	**$649,508**	**–**
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Engineering	–	$47,000
SDG&E Internal Costs	–	$270,000
Contingency Costs	**$161,550**	**–**
Total Demolition Costs	**$1,128,058**	**–**

Table 2-2 — Cuyamaca Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
341	Other Production – Structures and Improvements	$459,273
342	Other Production – Fuel Holders, Producers, and Accessories	$69,713
344	Other Production – Generators	$333,484
345	Other Production – Accessory Electric Equipment	$265,588
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$1,128,060**

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for San Diego, California as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for arrival time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from supplied engineering information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included for the decommissioning contractor indirect costs in the cost estimate as direct costs, as noted for the following:

   - Labor supervision (additional compensation for labor foreman/supervisors)
   - Construction management
   - Field office expenses
   - Safety
   - Temporary facilities
   - Mobilization/demobilization
   - Legal expenses/claims
   - Small tools and consumables
   - General liability insurance
   - Construction equipment mobilization/demobilization
   - Freight on material
   - Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

- Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

5. Scrap

Scrap metals are a globally traded commodity and are part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions; as such, the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is estimated at $30/ton, resulting in the values shown in Table 3-1:

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
#2 Copper	6,145
#2 Insulated Copper Wire	2,440

Note: 1 ton = 2000 lbs.

6. Project Schedule

Cuyamaca has a 12-month construction schedule.

7. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, the engineering required to place the plant in a safe shutdown, and any unique engineering required during demolition.
- SDG&E internal costs are included to cover costs in support of decommissioning the facility.

Table 3-2 – SDG&E Internal Costs in Support of Decommissioning

Activity	Estimated Cost
Labor to prepare the site for demolition, including drain oils, drain reagents, de-energization of the power buses, etc.	$90,000
Site security	$60,000
Subcontracts to remove chemicals, oils, and reagents from the site	$40,000
SDG&E project management, permitting, and procurement	$80,000
Total	**$270,000**

8. Escalation Rates

Escalation rates were excluded from the estimates.

[1] www.americanrecycler.com

9. Sales and Use Taxes

Sales and use taxes were excluded from the estimates.

10. Contingency

- A 15% contingency is applied for labor, material, equipment, subcontracting, and indirect costs. General conditions (indirect demolition contractor costs) are allocated across labor, material, and equipment.
- There is no contingency on scrap value

11. Contract Basis for Estimate

The contracting strategy is a multiple lump sum for the estimate.

12. Assumptions

- The facility will be in safe-shutdown mode and ready for a decommissioning contractor to start work.
- All chemicals and lubricating oils will be removed from the facilities to be demolished by the utility before demolition.
- No extraordinary environmental costs for demolition will be needed.
- There will be no PCBs on site at the time of demolition.
- Switchyards within the plant boundaries are not part of the scope, nor are access roads to these facilities.
- All items above grade and to a depth of one foot, including foundations, will be demolished. Any other items buried more than one foot deep will remain in place.
- Underground piping will be abandoned in place.
- Underground piping larger than four feet in diameter will be filled with sand or slurry and capped at the ends to prevent collapse (none noted at this site). Non-metal pipe will be collapsed.
- All demolished materials are considered debris, except for organic combustibles and non-embedded metals, which have scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- Handling onsite and offsite disposal of hazardous materials will be performed in compliance with methods approved by SDG&E's Environmental Services Department.
- All borrow (fill) material is assumed to be from offsite sources.
- Catalyst is assumed to be removed and returned to the original equipment manufacturer before demolition.

4. REFERENCES

1. Sargent & Lundy Cost Database.
2. R.S. Means Cost Data, 2021.
3. Engineering drawings, equipment lists, and other information provided by the San Diego Gas & Electric.
4. 2020 Form EIA-860 Data – Schedule 3, “Generator Data” (Retired & Canceled Units Only).
5. *Scrap Metals MarketWatch*, West Coast (Zone 1), www.americanrecycler.com.

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DISMANTLE CUYAMACA PEAK ENERGY PLANT

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	33965B

SAN DIEGO GAS & ELECTRIC
CAYAMACA PEAK ENERGY PLANT
DECOMMISSIONG STUDY

Sargent & Lundy

Group	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00	WHOLE PLANT DEMOLITION				3,604	296,981	86,240	383,221
18.00.00	SCRAP VALUE		(110,494)		0			(110,494)
21.00.00	CIVIL WORK	15,000		91,240	472	39,490	12,559	158,289
	TOTAL DIRECT	15,000	(110,494)	91,240	4,076	336,471	98,799	431,016

Estimate Totals

Description	Amount	Totals	Hours
Labor	336,471		4,076
Material	91,240		
Subcontract	15,000		
Construction Equipment	98,799		
Scrap Value	(110,494)		
	431,016	**431,016**	
General Conditions			
Additional Labor Costs			
90-1 Labor Supervision	20,188		
90-2 Show-up Time	6,729		
90-3 Cost Due To OT 5-10's			
90-4 Cost Due To OT 6-10's			
90-5 Per Diem			
Site Overheads			
91-1 Construction Management	36,339		
91-2 Field Office Expenses	7,995		
91-3 Material&Quality Control			
91-4 Site Services			
91-5 Safety	7,179		
91-6 Temporary Facilities	5,462		
91-7 Temporary Utilities			
91-8 Mobilization/Demob.	5,756		
91-9 Legal Expenses/Claims	850		
Other Construction Indirects			
92-1 Small Tools & Consumables	3,634		
92-2 Scaffolding			
92-3 General Liability Insur.	3,634		
92-4 Constr. Equip. Mob/Demob	9,880		
92-5 Freight on Material	4,562		
92-6 Freight on Scrap			
92-7 Sales Tax			
92-8 Contractors G&A	43,764		
92-9 Contractors Profit	62,520		
	218,492	**649,508**	
Project Indirect Costs			
93-1 Engineering Services	47,000		
93-2 CM Support			
93-3 Start-Up/Commissioning			
93-4 Start-Up/Spare Parts			
93-5 Excess Liability Insur.			
93-6 Sales Tax On Indirects			
93-7 SDG&E Internal Costs	270,000		
93-8 EPC Fee			
	317,000	**966,508**	
Contingency			
94-1 Contingency on Const Eq	18,821		
94-3 Contingency on Material	16,813		
94-4 Contingency on Labor	76,116		
94-5 Contingency on Subcontr.	2,250		
94-6 Contingency on Scrap			
94-7 Contingency on Indirect	47,550		
	161,550	**1,128,058**	
Escalation			
96-1 Escalation on Const Equip			
96-3 Escalation on Material			
96-4 Escalation on Labor			
96-5 Escalation on Subcontract			
96-6 Escalation on Scrap			
96-7 Escalation on Indirects			
		1,128,058	
98 Interest During Constr			
		1,128,058	
Total		**1,128,058**	

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00		**WHOLE PLANT DEMOLITION**									
	10.21.00	CIVIL WORK									
		REMOVE FENCE		370.00 LF	-	-		44	3,945	2,050	5,995
		INCORPORATE EXISTING PAVED SURFACES INTO NEW PARKING LOT	EXISTING PAVED SURFACES (IF NOT DISTURBED, WILL NOT BE DEMOLISHED)	1,500.00 SY	-	-		180	15,993	8,312	24,305
		CIVIL WORK						224	19,938	10,363	30,301
	10.22.00	CONCRETE									
		BUILDING/EQUIPMENT FOUNDATION/PAD	SCR	89.00 CY	-	-		100	8,935	2,202	11,137
		BUILDING/EQUIPMENT FOUNDATION/PAD	STACK FDN	36.00 CY	-	-		41	3,614	891	4,505
		BUILDING/EQUIPMENT FOUNDATION/PAD	RAW AND DEMIN WATER TANKS	84.00 CY	-	-		95	8,433	2,078	10,511
		BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA AND WASH DOWN TANK CURBS AND WALL	27.00 CY	-	-		30	2,711	668	3,379
		BUILDING/EQUIPMENT FOUNDATION/PAD	850 LF OF PERIMETER CURB	45.00 CY	-	-		51	4,518	1,113	5,631
		BUILDING/EQUIPMENT FOUNDATION/PAD	SWITCHYARD AND MAIN TRANSFORMER FDN	20.00 CY	-	-		23	2,008	495	2,503
		BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMERS FDN	8.00 CY	-	-		9	803	198	1,001
		BUILDING/EQUIPMENT FOUNDATION/PAD	CONTROL / SWITCHGEAR BUILDING	22.00 CY	-	-		25	2,209	544	2,753
		TURBINE GENERATOR FDN	BOTH CT'S AND GENERATOR	148.00 CY	-	-		266	23,774	5,858	29,632
		CONCRETE						639	57,004	14,047	71,051
	10.23.00	STEEL									
		STRUCTURAL, GIRT AND GALLERY STEEL		57.00 TN	-	-		58	4,955	976	5,931
		PERIMETER SHEET METAL WALL	INCLUDES STEEL COLUMNS	31.00 TN	-	-		84	7,161	1,411	8,573
		STEEL						142	12,116	2,388	14,504
	10.24.00	ARCHITECTURAL									
		CONTROL / SWITCHGEAR BUILDING	13' X 40' X 12'H	6,240.00 CF	-	-		19	1,558	519	2,077
		ELECTRICAL BUILDING	12' X 50' X 12'H	7,200.00 CF	-	-		22	1,798	599	2,397
		MASONRY WALLS	80'L X 22'H X 2' THICK	1,760.00 SF	-	-		14	1,172	390	1,562
		ARCHITECTURAL						54	4,528	1,509	6,036
	10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
		MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		300	23,982	6,831	30,813
		MISCELLANEOUS STRUCTURAL ITEM						300	23,982	6,831	30,813
	10.31.00	MECHANICAL EQUIPMENT									
		COMBUSTION TURBINE	FT8 SWIFTPAC (2 CTs W/GENERATOR AND ACCESSORIES	119.00 TN	-	-		417	33,295	9,484	42,779
		SCR CASING		19.00 TN	-	-		51	4,101	1,168	5,269
		SCR CAVITY DUCTWORK		39.00 TN	-	-		105	8,418	2,398	10,815
		TANKS AND SILOS	47,000 GAL, RAW WATER STORAGE TANK	12.00 TN	-	-		32	2,590	738	3,328
		TANKS AND SILOS	47,000 GAL, DEMINERALIZED WATER TANK	12.00 TN	-	-		32	2,590	738	3,328
		TANKS AND SILOS	12,000 GAL, AQUEOUS AMMONIA TANK	5.00 TN	-	-		14	1,079	307	1,387
		FUEL GAS COMPRESSOR AND GAS CONDITIONING SKID		25.00 TN	-	-		68	5,396	1,537	6,933
		MISCELLANEOUS EQUIPMENT		15.00 TN	-	-		41	3,238	922	4,160
		CT AIR INTAKE SYSTEM W DUCTS & SILENCER	2 CT'S	28.00 TN	-	-		76	6,043	1,721	7,765
		WASHDOWN DRAIN TANK		2.00 TN	-	-		8	640	182	822
		CT LUBE OIL SYSTEM		3.00 TN	-	-		15	1,199	342	1,541
		STEEL EXHAUST STACK	55 FT X 10 FT DIA	20.00 TN	-	-		41	3,238	922	4,160
		MECHANICAL EQUIPMENT						899	71,826	20,459	92,285
	10.35.00	PIPING									
		LARGE BORE PIPING, VALVES AND HANGERS	3550 LF	24.00 TN	-	-		49	3,885	1,107	4,992
		SMALL BORE PIPING, VALVES AND HANGERS		8.00 TN	-	-		16	1,295	369	1,664
		FIRE LINES AND HYDRANTS		1.00 LT	-	-		80	6,395	1,822	8,217
		PIPING						145	11,575	3,297	14,872
	10.41.00	ELECTRICAL EQUIPMENT									
		TRANSFORMERS	ONE (1) 13.8 KV / 4.16 KV, ONE (1)	9.00 TN	-	-		24	1,922	548	2,470

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.41.00	ELECTRICAL EQUIPMENT									
		TRANSFORMERS	13.8 KV / 480 V	9.00 TN	-	-		24	1,922	548	2,470
		OUTDOOR LIGHT POLE / FIXTURE		1.00 LT	-	-		150	11,991	3,416	15,407
		MISCELLANEOUS ELECTRICAL EQUIPMENT		103.00 TN	-	-		367	29,337	8,356	37,693
		ELECTRICAL EQUIPMENT						541	43,251	12,319	55,570
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
		CONDUIT		12,000.00 LF	-	-		120	9,593	2,732	12,325
		CABLE TRAY		2,500.00 LF	-	-		100	7,994	2,277	10,271
		RACEWAY, CABLE TRAY, & CONDUIT						220	17,587	5,009	22,596
	10.43.00	CABLE									
		COPPER WIRE / CABLE - MEDIUM VOLTAGE		4,500.00 LF	-	-		90	7,195	2,049	9,244
		COPPER WIRE / CABLE - LOW VOLTAGE		25,000.00 LF	-	-		250	19,985	5,693	25,678
		CABLE						340	27,180	7,742	34,921
	10.44.00	CONTROL & INSTRUMENTATION									
		CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	7,994	2,277	10,271
		CONTROL & INSTRUMENTATION						100	7,994	2,277	10,271
		WHOLE PLANT DEMOLITION						**3,604**	**296,981**	**86,240**	**383,221**
18.00.00		**SCRAP VALUE**									
	18.10.00	MIXED STEEL									
		CARBON STEEL		-78.00 TN	-	(13,650)	-	0			(13,650)
		CARBON STEEL		-253.00 TN	-	(44,275)	-	0			(44,275)
		CARBON STEEL	BUILDINGS	-5.32 TN	-	(931)	-	0			(931)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-15.78 TN	-	(2,761)	-	0			(2,761)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-7.50 TN	-	(1,312)	-	0			(1,312)
		CARBON STEEL		-88.00 TN	-	(15,400)	-	0			(15,400)
		CARBON STEEL	MISCELLANEOUS ELECTRICAL EQUIPMENT	-103.00 TN	-	(18,025)	-	0			(18,025)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-9.00 TN	-	(3,150)	-	0			(3,150)
		MIXED STEEL				(99,505)		0			(99,505)
	18.30.00	COPPER									
		#2 SOLID COPPER / TUBING	BUS BAR	-0.20 TN	-	(1,229)	-				(1,229)
		#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-	0			(9,760)
		COPPER				(10,989)		0			(10,989)
		SCRAP VALUE				**(110,494)**		**0**			**(110,494)**
21.00.00		**CIVIL WORK**									
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	308.00 CY	6,160	-					6,160
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	111.00 CY	2,220	-					2,220
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	273.00 CY	5,460	-					5,460
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	28.00 CY	560	-					560
		HAULING			14,400						14,400
	21.21.00	MASS FILL									
		MASS FILL, COMMON EARTH 6 INCHES THICK	COVER DISTURBED AREAS OF SITE WITH 1' OF BACKFILL MATERIAL	652.00 CY	-	-	13,040	23	2,079	2,190	17,310
		MASS FILL					13,040	23	2,079	2,190	17,310
	21.52.00	WASTE DISPOSAL									
		DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	20.00 CY	600	-					600
		WASTE DISPOSAL			600						600

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	21.57.00	ROAD, PARKING AREA, & SURFACED AREA									
		COVER DISTURBED AREAS OF SITE WITH 2.5" OF ASPHALT OVER 4" OF CRUSHED ROCK BASE	NEW PARKING LOT	1,955.00 SY	-	-	78,200	450	37,411	10,369	125,980
		ROAD, PARKING AREA, & SURFACED AREA					78,200	450	37,411	10,369	125,980
		CIVIL WORK			**15,000**		**91,240**	**472**	**39,490**	**12,559**	**158,289**

APPENDIX B. CONCEPTUAL ESTIMATE OF COST — FERC ACCOUNTS

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	11/30/21
Reviewed By	BA
Approved By	BA
Estimate No.	33965B

SAN DIEGO GAS & ELECTRIC
CAYAMACA PEAK ENERGY PLANT
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Area	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
341	OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS	11,017	(16,331)	182,667	1,048	219,215	62,705	459,273
342	OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES	3,618	(13,650)		316	65,033	14,713	69,713
344	OTHER PRODUCTION - GENERATORS	8,898	(44,275)		1,479	299,831	69,030	333,484
345	OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT	913	(36,238)		1,233	242,879	58,034	265,588

Estimate Totals

Description	Amount	Totals	Hours
Labor	826,958		4.076
Material	182,667		
Subcontract	24,445		
Construction Equipment	204,483		
Scrap Value	(110,494)		
	1,128,059	1,128,059	
General Conditions			
Additional Labor Costs			
Site Overheads			
Other Construction Indirects			
		1,128,059	
Project Indirect Costs			
		1,128,059	
Contingency			
		1,128,059	
Escalation			
		1,128,059	
Total		**1,128,059**	

General Conditions, Indirect Costs and Contingency are allocated in the line items above.

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
341			**OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			REMOVE FENCE		370.00 LF	-	-		44	9,696	4,244	13,939
			INCORPORATE EXISTING PAVED SURFACES INTO NEW PARKING LOT	EXISTING PAVED SURFACES (IF NOT DISTURBED, WILL NOT BE DEMOLISHED)	1,500.00 SY	-	-		180	39,307	17,204	56,511
			CIVIL WORK						224	49,002	21,448	70,450
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	850 LF OF PERIMETER CURB	45.00 CY	-	-		51	11,104	2,304	13,408
			BUILDING/EQUIPMENT FOUNDATION/PAD	CONTROL / SWITCHGEAR BUILDING	22.00 CY	-	-		25	5,428	1,126	6,555
			CONCRETE						75	16,532	3,430	19,962
		10.23.00	STEEL									
			STRUCTURAL, GIRT AND GALLERY STEEL		57.00 TN	-	-		58	12,178	2,021	14,199
			PERIMETER SHEET METAL WALL	INCLUDES STEEL COLUMNS	31.00 TN	-	-		84	17,601	2,921	20,521
			STEEL						142	29,779	4,942	34,720
		10.24.00	ARCHITECTURAL									
			CONTROL / SWITCHGEAR BUILDING	13' X 40' X 12'H	6,240.00 CF	-	-		19	3,829	1,074	4,904
			ELECTRICAL BUILDING	12' X 50' X 12'H	7,200.00 CF	-	-		22	4,418	1,240	5,658
			MASONRY WALLS	80'L X 22'H X 2' THICK	1,760.00 SF	-	-		14	2,880	808	3,688
			ARCHITECTURAL						54	11,128	3,122	14,250
		10.35.00	PIPING									
			FIRE LINES AND HYDRANTS		1.00 LT	-	-		80	15,718	3,770	19,488
			PIPING						80	15,718	3,770	19,488
			WHOLE PLANT DEMOLITION						576	122,159	36,712	158,871
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	BUILDINGS	-5.32 TN	-	(931)	-	0			(931)
			CARBON STEEL		-88.00 TN	-	(15,400)	-	0			(15,400)
			MIXED STEEL				(16,331)		0			(16,331)
			SCRAP VALUE				(16,331)		0			(16,331)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	308.00 CY	10,039	-					10,039
			HAULING			10,039						10,039
		21.21.00	MASS FILL									
			MASS FILL, COMMON EARTH 6 INCHES THICK	COVER DISTURBED AREAS OF SITE WITH 1' OF BACKFILL MATERIAL	652.00 CY	-	-	26,107	23	5,111	4,533	35,750
			MASS FILL					26,107	23	5,111	4,533	35,750
		21.52.00	WASTE DISPOSAL									
			DISPOSAL AND TRANSPORTATION FEE	RUBBISH & TENANT DEBRIS	20.00 CY	978	-					978
			WASTE DISPOSAL			978						978
		21.57.00	ROAD, PARKING AREA, & SURFACED AREA									
			COVER DISTURBED AREAS OF SITE WITH 2.5" OF ASPHALT OVER 4" OF CRUSHED ROCK BASE	NEW PARKING LOT	1,955.00 SY	-	-	156,560	450	91,946	21,460	269,967
			ROAD, PARKING AREA, & SURFACED AREA					156,560	450	91,946	21,460	269,967
			CIVIL WORK			11,017		182,667	472	97,057	25,994	316,734
			341 OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS			**11,017**	**(16,331)**	**182,667**	**1,048**	**219,215**	**62,705**	**459,273**
342			**OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	RAW AND DEMIN WATER TANKS	84.00 CY	-	-		95	20,727	4,301	25,027
			BUILDING/EQUIPMENT FOUNDATION/PAD	AMMONIA AND WASH DOWN TANK CURBS AND WALL	27.00 CY	-	-		30	6,662	1,382	8,045

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			CONCRETE						125	27,389	5,683	33,072
		10.31.00	MECHANICAL EQUIPMENT									
			TANKS AND SILOS	47,000 GAL, RAW WATER STORAGE TANK	12.00 TN	-	-		32	6,366	1,527	7,893
			TANKS AND SILOS	47,000 GAL, DEMINERALIZED WATER TANK	12.00 TN	-	-		32	6,366	1,527	7,893
			TANKS AND SILOS	12,000 GAL, AQUEOUS AMMONIA TANK	5.00 TN	-	-		14	2,652	636	3,289
			MISCELLANEOUS EQUIPMENT		15.00 TN	-	-		41	7,957	1,909	9,866
			WASHDOWN DRAIN TANK		2.00 TN	-	-		8	1,572	377	1,949
			MECHANICAL EQUIPMENT						127	24,913	5,976	30,888
		10.35.00	PIPING									
			LARGE BORE PIPING, VALVES AND HANGERS	3550 LF	24.00 TN	-	-		49	9,549	2,290	11,839
			SMALL BORE PIPING, VALVES AND HANGERS		8.00 TN	-	-		16	3,183	763	3,946
			PIPING						65	12,731	3,054	15,785
			WHOLE PLANT DEMOLITION						316	65,033	14,713	79,745
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-78.00 TN	-	(13,650)	-	0			(13,650)
			MIXED STEEL				(13,650)		0			(13,650)
			SCRAP VALUE				(13,650)		0			(13,650)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	111.00 CY	3,618	-					3,618
			HAULING			3,618						3,618
			CIVIL WORK			3,618						3,618
			342 OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES			**3,618**	**(13,650)**		**316**	**65,033**	**14,713**	**69,713**
344			**OTHER PRODUCTION - GENERATORS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	SCR	89.00 CY	-	-		100	21,960	4,557	26,517
			BUILDING/EQUIPMENT FOUNDATION/PAD	STACK FDN	36.00 CY	-	-		41	8,883	1,843	10,726
			TURBINE GENERATOR FDN	BOTH CT'S AND GENERATOR	148.00 CY	-	-		266	58,429	12,124	70,554
			CONCRETE						407	89,272	18,525	107,797
		10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
			MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		300	58,942	14,138	73,080
			MISCELLANEOUS STRUCTURAL ITEM						300	58,942	14,138	73,080
		10.31.00	MECHANICAL EQUIPMENT									
			COMBUSTION TURBINE	FT8 SWIFTPAC (2 CTs W/GENERATOR AND ACCESSORIES	119.00 TN	-	-		417	81,830	19,628	101,459
			SCR CASING		19.00 TN	-	-		51	10,079	2,418	12,497
			SCR CAVITY DUCTWORK		39.00 TN	-	-		105	20,688	4,962	25,651
			FUEL GAS COMPRESSOR AND GAS CONDITIONING SKID		25.00 TN	-	-		68	13,262	3,181	16,443
			CT AIR INTAKE SYSTEM W DUCTS & SILENCER	2 CT'S	28.00 TN	-	-		76	14,853	3,563	18,416
			CT LUBE OIL SYSTEM		3.00 TN	-	-		15	2,947	707	3,654
			STEEL EXHAUST STACK	55 FT X 10 FT DIA	20.00 TN	-	-		41	7,957	1,909	9,866
			MECHANICAL EQUIPMENT						772	151,617	36,368	187,985
			WHOLE PLANT DEMOLITION						1,479	299,831	69,030	368,861
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-253.00 TN	-	(44,275)	-	0			(44,275)
			MIXED STEEL				(44,275)		0			(44,275)
			SCRAP VALUE				(44,275)		0			(44,275)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	273.00 CY	8,898	-					8,898
			HAULING			8,898						8,898

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			CIVIL WORK			8,898						8,898
			344 OTHER PRODUCTION - GENERATORS			**8,898**	**(44,275)**		**1,479**	**299,831**	**69,030**	**333,484**
345			**OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	SWITCHYARD AND MAIN TRANSFORMER FDN	20.00 CY	-	-		23	4,935	1,024	5,959
			BUILDING/EQUIPMENT FOUNDATION/PAD	AUX TRANSFORMERS FDN	8.00 CY	-	-		9	1,974	410	2,384
			CONCRETE						32	6,909	1,434	8,343
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	ONE (1) 13.8 KV / 4.16 KV, ONE (1) 13.8 KV / 480 V	9.00 TN	-	-		24	4,725	1,133	5,858
			OUTDOOR LIGHT POLE / FIXTURE		1.00 LT	-	-		150	29,471	7,069	36,540
			MISCELLANEOUS ELECTRICAL EQUIPMENT		103.00 TN	-	-		367	72,103	17,295	89,398
			ELECTRICAL EQUIPMENT						541	106,299	25,497	131,796
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT		12,000.00 LF	-	-		120	23,577	5,655	29,232
			CABLE TRAY		2,500.00 LF	-	-		100	19,647	4,713	24,360
			RACEWAY, CABLE TRAY, & CONDUIT						220	43,224	10,368	53,592
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE		4,500.00 LF	-	-		90	17,682	4,241	21,924
			COPPER WIRE / CABLE - LOW VOLTAGE		25,000.00 LF	-	-		250	49,118	11,782	60,900
			CABLE						340	66,800	16,023	82,823
		10.44.00	CONTROL & INSTRUMENTATION									
			CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	19,647	4,713	24,360
			CONTROL & INSTRUMENTATION						100	19,647	4,713	24,360
			WHOLE PLANT DEMOLITION						1,233	242,879	58,034	300,913
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-15.78 TN	-	(2,761)	-	0			(2,761)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-7.50 TN	-	(1,312)	-	0			(1,312)
			CARBON STEEL	MISCELLANEOUS ELECTRICAL EQUIPMENT	-103.00 TN	-	(18,025)	-	0			(18,025)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-9.00 TN	-	(3,150)	-	0			(3,150)
			MIXED STEEL				(25,249)		0			(25,249)
		18.30.00	COPPER									
			SOLID COPPER	BUS BAR	-0.20 TN	-	(1,229)	-				(1,229)
			#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-	0			(9,760)
			COPPER				(10,989)		0			(10,989)
			SCRAP VALUE				(36,238)		0			(36,238)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	28.00 CY	913	-					913
			HAULING			913						913
			CIVIL WORK			913						913
			345 OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT			**913**	**(36,238)**		**1,233**	**242,879**	**58,034**	**265,588**

APPENDIX C. EXPLANATION OF VARIANACE FROM THE PREVIOUS COST STUDY

Cost Category	2021 Cost Estimate		2016 Cost Estimate		Delta	% of total cost	Discussion
Labor							
Labor - Direct		$336,471					
Labor Supervision	$20,188						The 2016 estimate included all demolition contractor costs in labor. The 2021 cost estimate broke out demolition contractor costs (subcontracts, construction equipment, general conditions - labor).
Show-up time	$6,729						
Construction Management	$36,339						
Field Office Expenses	$7,995						
Safety	$7,179						Average labor hourly labor cost increased by 9.4%.
Temporary Facilities	$5,462						
Mob/Demob	$5,756						
Small tools & consumables	$3,634						
General Liability Insurance	$3,634						
Constr Equip Mob/Demob	$9,880						
Legal Expenses/Claims	$850						
General Conditions (Indirect) - Labor		$107,646					
Subcontract		$15,000					
Construction Equipment		$98,799					
Labor Subtotal		**$557,916**		**$510,052**	**9.4%**	**4.2%**	
Material							
Material w/o freight	$91,240						The 2021 cost estimate for material is 13.5% more than 2016.
General Conditions -Freight on Material	$4,562						
Material Subtotal		**$95,802**		**$84,371**	**13.5%**	**1.0%**	
Scrap							The 2021 cost estimate for scrap is 22.7% less than 2016. The main reasons are: (a) cost for scrap mixed steel increased by 114%. Cost for mixed steel in 2021 based on a 12-month average is $175 per ton as compared to 2016 based on a 3-month average of $87 per ton (b) cost for copper decreased by -98.6%. Cost for copper in 2021 was broken out into #2 copper (solid) and #2 (insulated wire) as compared to 2016 which was based on #1 copper (solid bright)
Mixed Steel	-$99,505		-$46,101				
Copper	-$10,989		-$96,880				
Subtotal Scrap Value		**-$110,494**		**-$142,981**	**-22.7%**	**2.9%**	
Subtotal - Direct & Indirect Demolition		**$543,224**		**$451,442**	**20.3%**	**8.1%**	
Contractor G&A and Profit							
Contractor G&A	$43,764		$25,503		71.6%		Contractor G&A is 71.6% higher. 2021 estimate is 7% of labor, equipment, and materials. 2016 estimate was 5% of labor and materials.
Contractor Profit	$62,520		$47,554		31.5%		Contractor Profit is 31.5%t higher. 2021 estimate is 10% of labor, equipment, and materials. 2016 estimate was 8% of labor and materials.
Subcontractor Contractor G&A and Profit		**$106,284**		**$73,057**	**45.5%**	**2.9%**	Increase in Contractor G&A and profit based on S&L database of actual demolition cost since 2016
Indirect							
Engineering	$47,000		$45,000 `				Higher cost due to SDGE internal costs in support of demolition as compared to 2016 where no SDGE internal costs were included
Construction Management	$0		$10,490				
Other SDGE Internal Costs	$270,000		$0				
Subtotal Indirect Costs		**$317,000**		**$55,490**	**471%**	**23.2%**	
Contingency		$161,550		$173,190	-6.7%	**-1.0%**	Contingency is less (-6.7%). Contingency in 2021 is 15% and not applied to scrap. Contingency in 2016 was 20% and applied to scrap.
Total		**$1,128,058**		**$753,179**	**49.8%**		

SCRAP	$/ton	tons	$/ton	tons	
Carbon Steel	$175	551	$87	529	Carbon steel scrap quantity is essentially the same
Steel/Copper mix (large transformers)	$350	9			Carbon/copper is for transformer.
# 1 Copper			$3,460	28	Copper in 2016 was based on solid bright (#1 grade) copper
#2 Copper	$6,145	0.2			Copper broken out into solid bar and insulated copper wire
#2 Insulated Copper Wire	$2,440	4			Lower copper quantity in 2021 due to copper included in steel/copper mix for larger transformers

Labor hours	4,076 hours	4,465 hours	-8.7%	The labor hours for the 2021 cost estimate are -8.7% less than the 2016 cost estimate. The main reason is that the 2021 cost estimate includes subcontracts (w/o labor hours), based on updated S&L standards

SL-016628.D_SDGE Decom(Desert Star)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Desert Star Energy Center

Prepared by Sargent & Lundy

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Sargent & Lundy is one of the oldest and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Sargent & Lundy delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public and private sector clients in the power and energy, gas distribution, industrial, and government sectors.

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ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
ACC	air-cooled condenser
CCW	closed cooling water
CT	combustion turbine
Desert Star	Desert Star Energy Center
FERC	Federal Energy Regulatory Commission
GSU	generator step-up transformer
HRSG	heat recovery steam generator
Owner	San Diego Gas & Electric Company
PCB	polychlorinated biphenyl
S&L	Sargent & Lundy, L.L.C.
SCR	selective catalytic reduction
SDG&E	San Diego Gas & Electric Company
ST	steam turbine

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of the Desert Star Energy Center (Desert Star) and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate and the benchmarking analysis for the facility.

METHODOLOGY

The S&L methodology for developing the cost estimate consists of three elements: (1) S&L experience in developing plant demolition costs and the existing S&L database for numerous other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by SDG&E. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment. Additionally, S&L performed a site walkdown to evaluate the site for dismantlement and determine any project-specific requirements. This site walkdown was performed in 2016, but recent discussions with the Owner and facility management confirmed that no significant modifications have occurred since that time. This information was used with unit cost factors developed by S&L based on industry data and experience. The unit cost factors for concrete removal, steel removal, and cost cutting were developed from labor and material cost information, and S&L estimated the quantities of recoverable metals that could be recovered and sold for scrap. As such, the estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

The benchmarking analysis considers publicly available data to determine the average service life of similar facilities.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning Desert Star is shown in Table ES-1. The cost estimate, divided into FERC accounts, is shown in Table ES-2. All costs are in 2021 U.S. dollars, and the total is the same in both tables: $11,226,187. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

Table ES-1 — Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$7,496,912**	**–**
Labor	–	$4,069,698
Subcontracts	–	$253,380
Equipment	–	$1,928,009
Material	–	$1,245,825
General Conditions (Decommissioning Contractor Indirect) Costs	**$2,873,137**	**–**
Scrap Value	**($1,978,169)**	**–**
Subtotal Demolition Contractor Costs	**$8,391,880**	**–**
Project Indirect Costs	**$1,112,000**	**–**
Engineering	–	$210,000
SDG&E Internal Costs	–	$902,000
Contingency Costs	**$1,722,307**	**–**
Total Demolition Costs	**$11,226,187**	**–**

Table ES-2 — FERC Account Cost Estimate Summary

FERC No.	Description	Total Cost
311	Structures & Improvements	$3,671,588
312	Boiler Plant Equipment	$2,243,392
314	Turbo Generator Units	$1,316,775
315	Accessory Electrical Equipment	$412,082
316	Miscellaneous Power Plant Equipment	$39,201
341	Other Production – Structures & Improvements	$2,455,075
342	Other Production – Fuel Holders, Producers, and Accessories	$12,092
344	Other Production – Generators	$844,735
345	Other Production – Accessory Electric Equipment	$231,248
–	General Conditions	Included Above
–	Engineering	Included Above
–	SDG&E Internal Costs	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$11,226,188**

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the dismantlement of the Desert Star Energy Center (Desert Star) and estimate the average service life of the facility's peer group. The work scope included updating the 2016 conceptual demolition cost estimate, report, and benchmarking analysis.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers over the years, the Sargent & Lundy Consulting Group has become one of the premier power project consultants in the power industry, and this commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineering services—including decommissioning cost estimations and average service life evaluations—for both global and domestic electric power assets.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimonial services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations expertise to support consulting services such as those performed for Desert Star.

1.3. FACILITY DESCRIPTION

Desert Star is a 2x2x1 gas-fired, combined-cycle power plant located about 40 miles southeast of Las Vegas, Nevada. The plant is rated at 490 MW and became operational in May 2000. The plant consists of two Siemens-Westinghouse 501FC+ combustion turbine (CT) generators and a Westinghouse BB 33-65 steam turbine (ST). Each gas turbine generator is rated for 160 MW, and the ST is rated for 170 MW. Each CT exhausts into a separate Nooter Ericksen triple-pressure heat recovery steam generator (HRSG) equipped with selective catalytic reduction (SCR). The steam produced by the two HRSGs drives the single ST generator, and the exhaust steam is condensed in a 30 Bay GEA air-cooled condenser (ACC).

Views of the overall sites, the Unit 2 HRSG, and the ACC are shown in Figure 1-1, Figure 1-2, and Figure 1-3, respectively.

Figure 1-1 — Desert Star Overview

Figure 1-2 — Desert Star Unit 2 HRSG

Figure 1-3 — Desert Star ACC

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of deterministic and stochastic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, linear feet of piping, equipment, etc.). Stochastic methods were also used if quantitative information (e.g., fire lines and hydrants, miscellaneous electrical equipment, etc.) was unavailable.

The cost estimate was developed based on drawings, documents, and data provided by the Owner. These drawings and documents were used to estimate the building foundation sizes, building volumes, steel quantities, and the quantity of piping, valves, and other equipment.

The S&L methodology for developing the cost estimate consists of three elements: (1) S&L experience in developing plant demolition cost and the existing S&L database for other projects; (2) use of the unit cost factor methodology; and (3) quotes from previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates include both summaries and details for each type of work performed, indirect costs, and contingencies. The database report lists costs by buildings, plant systems, and other categories.

S&L developed an inventory of plant piping, valves, equipment, HVAC ducts, concrete, galleries, cable trays, and other equipment based on a review of drawings and a site walkdown that evaluated dismantlement and determined any project-specific requirements. This information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for concrete removal, steel removal, cost cutting, and other tasks were developed from labor and material cost information. S&L also estimated the quantities of recoverable metals that could be recovered and sold for scrap. As such, the estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

S&L worked from site general arrangement drawings and company documentation for the facilities, including information about any existing metal cleaning storage ponds, asbestos inventories, polychlorinated biphenyl (PCB) inventories, or sludge ponds. S&L relied on SDG&E to identify the location of environmental issues that need to be considered in the estimates (S&L's scope of work excludes a detailed survey and testing program to identify such problems).

2.2. COST ESTIMATE SUMMARY

The summary of the Desert Star decommissioning cost estimate is shown in Table 2-1. The commercial and technical basis for the estimate is described in Section 3, and the detailed estimate is included in Appendix A. The cost estimate breakdown into FERC accounts is shown in Table 2-2, and the allocation of FERC accounts is shown in Appendix B. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

The 2021 cost estimate format was changed to be consistent with S&L's current standards. The variance between the 2021 and 2016 cost estimate is shown in Appendix C.

Table 2-1 — Desert Star Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$7,496,912**	**–**
Labor	–	$4,069,698
Subcontracts	–	$253,380
Equipment	–	$1,928,009
Material	–	$1,245,825
General Conditions (Decommissioning Contractor Indirect) Costs	**$2,873,137**	**–**
Scrap Value	**($1,978,169)**	**–**
Subtotal Demolition Contractor Costs	**$8,391,880**	**–**
Project Indirect Costs	**$1,112,000**	**–**
Engineering	–	$210,000
SDG&E Internal Costs	–	$902,000
Contingency Costs	**$1,722,307**	**–**
Total Demolition Costs	**$11,226,187**	**–**

Table 2-2 — Desert Star Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
311	Structures & Improvements	$3,671,588
312	Boiler Plant Equipment	$2,243,392
314	Turbo Generator Units	$1,316,775
315	Accessory Electrical Equipment	$412,082
316	Miscellaneous Power Plant Equipment	$39,201
341	Other Production – Structures & Improvements	$2,455,075
342	Other Production – Fuel Holders, Producers, and Accessories	$12,092
344	Other Production – Generators	$844,735
345	Other Production – Accessory Electric Equipment	$231,248
–	General Conditions	Included Above
–	Engineering	Included Above
–	SDG&E Internal Costs	Included Above
–	Contingency	Included Above
–	**Total Project Cost**	**$11,226,188**

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for Las Vegas, Nevada as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever prevails in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for arrival time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from supplied engineering information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included in the decommissioning contractor indirect costs for the following:

   - Labor supervision (additional compensation for the labor foreman/supervisors)
   - Construction management
   - Field office expenses
   - Safety
   - Temporary facilities
   - Mobilization/demobilization
   - Legal expenses/claims
   - Small tools and consumables
   - General liability insurance
   - Construction equipment mobilization/demobilization
   - Freight on material
   - Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], materials [direct material cost and freight cost], and equipment)
   - Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], materials [direct material cost and freight cost], and equipment)

5. Scrap

Scrap metals are a globally traded commodity and part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions; as such, the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) in the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is estimated at $30/ton, resulting in the values shown in Table 3-2:

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
#2 Copper	6145
#2 Insulated Copper Wire	2440

Note: 1 ton = 2000 lbs.

6. Project Schedule

Desert Star has an 18-month construction schedule.

7. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, the engineering required to place the plant in a safe shutdown, and any unique engineering required during demolition.
- SDG&E internal costs are included to cover costs in support of decommissioning the facility.

Table 3-2 — SDG&E Internal Costs in Support of Decommissioning

Activity	Estimated Cost
Labor to prepare the site for demolition, including drain oils, drain reagents, de-energization of the power buses, etc.	$602,000
Site security	$80,000
Subcontracts to remove chemicals, oils, and reagents from the site	$100,000
SDG&E project management, permitting, and procurement	$120,000
Total	**$902,000**

8. Escalation Rates

Escalation rates were excluded from the estimates.

[1] www.americanrecycler.com

9. Sales and Use Taxes

Sales and use taxes were excluded from the estimates.

10. Contingency

- A 15% contingency is applied for labor, material, equipment, subcontracting, and indirect costs. General conditions (indirect demolition contractor costs) are allocated across labor, material, and equipment.
- There is no contingency on scrap value.

11. Contract Basis

The contracting strategy is a multiple lump sum for the estimate.

12. Assumptions

- The facility will be in safe-shutdown mode and ready for a decommissioning contractor to begin work.
- All chemicals and lubricating oils will be removed from the facilities to be properly disposed of by the utility before demolition. Chemical removal will include ammonia hydroxide and 25,000 gallons of CCW glycol. Oil removal will include all oil-filled systems and equipment such as lubrication systems, transformers, ACC fans, CCW fans, etc.
- No extraordinary environmental costs for demolition will be needed.
- There will be no PCBs on site at the time of demolition.
- Switchyards within the plant boundaries are not part of the scope, nor are access roads to these facilities.
- All items above grade and to a depth of one foot—including foundations—will be demolished. Any other items buried more than one foot deep will remain in place.
- Underground piping will be abandoned in place.
- Underground piping larger than four feet in diameter will be filled with sand or slurry and capped at the ends to prevent collapse (though there was no such piping noted at the site). Non-metal pipes will be collapsed.
- All demolished materials are considered debris, except for organic combustibles and non-embedded metals, which have scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- Handling onsite and offsite disposal of hazardous materials will be performed in compliance with methods approved by SDG&E's Environmental Services Department.
- All borrow (fill) material will be from offsite sources.
- Catalyst will be removed and returned to the original equipment manufacturer before demolition.

- Most of the water in the evaporation ponds will evaporate after retirement. Removing the solids and/or any pond liner after evaporation is not included in the estimate as an SDG&E internal cost or as a demolition cost.
- The entire site (ponds included) will be covered with 6 inches of material. Pond berms are to be leveled without consideration to the final topography or elevation of the ponds.
- The water from the demineralized water/reverse-osmosis tanks will be removed from the tanks by SDG&E prior to demolition (up to 500,000 gallons).

4. REFERENCES

1. Sargent & Lundy Cost Database
2. RS Means Cost Data, 2021
3. Engineering drawings, equipment lists, and other information provided by San Diego Gas & Electric Company
4. 2020 Form EIA-860 Data – Schedule 3, “Generator Data” (retired and canceled units only)
5. *Scrap Metals MarketWatch* – West Coast (Zone 1), www.americanrecycler.com
6. Lease Agreement – The City of Boulder City and El Dorado Energy, LLC
7. Lease Agreement – First Renewal Option, 2016

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DISMANTLE DESERT STAR

Estimator	GA
Labor rate table	21NVLAS
Project No.	A14520.001
Estimate Date	03/12/2022
Reviewed By	BA
Approved By	BA
Estimate No.	31088D

Group	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00	WHOLE PLANT DEMOLITION				45,045	3,323,442	1,082,369	4,405,811
18.00.00	SCRAP VALUE		(1,978,169)					(1,978,169)
21.00.00	CIVIL WORK	253,380		1,245,825	8,811	746,256	845,639	3,091,101
	TOTAL DIRECT	253,380	(1,978,169)	1,245,825	53,856	4,069,698	1,928,009	5,518,743

Estimate Totals

Description	Amount	Totals	Hours
Labor	4,069,698		53,856
Material	1,245,825		
Subcontract	253,380		
Construction Equipment	1,928,009		
Scrap Value	(1,978,169)		
	5,518,743	**5,518,743**	
General Conditions			
Additional Labor Costs			
90-1 Labor Supervision	244,182		
90-2 Show-up Time	81,394		
90-3 Cost Due To OT 5-10's			
90-4 Cost Due To OT 6-10's			
90-5 Per Diem			
Site Overheads			
91-1 Construction Management	439,527		
91-2 Field Office Expenses	96,696		
91-3 Material&Quality Control			
91-4 Site Services			
91-5 Safety	86,829		
91-6 Temporary Facilities	66,061		
91-7 Temporary Utilities			
91-8 Mobilization/Demob.	69,621		
91-9 Legal Expenses/Claims	10,285		
Other Construction Indirects			
92-1 Small Tools & Consumables	43,953		
92-2 Scaffolding			
92-3 General Liability Insur.	43,953		
92-4 Constr. Equip. Mob/Demob	192,801		
92-5 Freight on Material	62,291		
92-6 Freight on Scrap			
92-7 Sales Tax			
92-8 Contractors G&A	591,106		
92-9 Contractors Profit	844,438		
	2,873,137	**8,391,880**	
Project Indirect Costs			
93-1 Engineering Services	210,000		
93-2 CM Support			
93-3 Start-Up/Commissioning			
93-4 Start-Up/Spare Parts			
93-5 Excess Liability Insur.			
93-6 Sales Tax On Indirects			
93-7 SDG&E Internal Cost	902,000		
93-8 EPC Fee			
	1,112,000	**9,503,880**	
Contingency			
94-1 Contingency on Const Eq	367,286		
94-3 Contingency on Material	229,574		
94-4 Contingency on Labor	920,640		
94-5 Contingency on Subcontr.	38,007		
94-6 Contingency on Scrap			
94-7 Contingency on Indirect	166,800		
	1,722,307	**11,226,187**	
Escalation			
96-1 Escalation on Const Equip			
96-3 Escalation on Material			
96-4 Escalation on Labor			
96-5 Escalation on Subcontract			
96-6 Escalation on Scrap			
96-7 Escalation on Indirects			
		11,226,187	
98 Interest During Constr			
		11,226,187	
Total		**11,226,187**	

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00		**WHOLE PLANT DEMOLITION**									
	10.21.00	**CIVIL WORK**									
		REMOVE FENCE		8,260.00 LF	-	-		330	27,093	15,258	42,351
		PAVED SURFACES, 6 IN THICK	STEAM PLANT	9,029.00 SY	-	-		1,083	88,845	50,035	138,880
		PAVED SURFACES, 6 IN THICK	OTHER PRODUCTION	9,029.00 SY	-	-		1,083	88,845	50,035	138,880
		CIVIL WORK						**2,497**	**204,784**	**115,328**	**320,112**
	10.22.00	**CONCRETE**									
		HRSG / STACK FDN	U-1, S-030 REV D	480.00 CY	-	-		540	44,545	11,875	56,419
		HRSG / STACK FDN	U-2, S-033 REV D	480.00 CY	-	-		540	44,545	11,875	56,419
		CEMS ENCLOSURE	U-1, S-031 REVD, 8'X21'X1'	6.00 CY	-	-		7	557	148	705
		CEMS ENCLOSURE	U-12 S-031 REVD, 8'X21'X1'	6.00 CY	-	-		7	557	148	705
		AIR COMPRESSOR	S-034 HRSG FOUNDATION AREA	3.00 CY	-	-		3	278	74	353
		AIR DRYER	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	93	25	118
		AIR RECEIVER	S-034 HRSG FOUNDATION AREA	35.00 CY	-	-		39	3,248	866	4,114
		BOILER FEED PUMPS (4)	S-034 HRSG FOUNDATION AREA	33.00 CY	-	-		37	3,062	816	3,879
		SCR SKID	S-034 HRSG FOUNDATION AREA	8.00 CY	-	-		9	742	198	940
		BURNER SKID	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	93	25	118
		BURNER BLOWER SKID	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	93	25	118
		BLOWDOWN TANK	S-034 HRSG FOUNDATION AREA	2.00 CY	-	-		2	186	49	235
		EXCITATION SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	6.00 CY	-	-		7	557	148	705
		EXCITATION TRANSFORMER	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	4.00 CY	-	-		5	371	99	470
		STEAM TURBINE LUBE OIL MODULE	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	24.00 CY	-	-		27	2,227	594	2,821
		SEAL OIL SUPPLY SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	8.00 CY	-	-		9	742	198	940
		GLAND STEAM CONDENSER SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	3.00 CY	-	-		3	278	74	353
		GLAND STEAM SUPPLY SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	9.00 CY	-	-		10	835	223	1,058
		MAIN & AUX TRANSFORMER FDNS	S-045 MAIN & AUX TRANSFORMERS (1)	148.00 CY	-	-		167	13,735	3,661	17,396
		MAIN & AUX TRANSFORMER FDNS	S-047 MAIN & AUX TRANSFORMERS (2)	160.00 CY	-	-		180	14,848	3,958	18,806
		SPARE TRANSFORMER (ALSTOM) PAD AND CONTAINMENT)		22.00 CY	-	-		25	2,042	544	2,586
		SPARE TRANSFORMER (ALSTOM) PAD AND CONTAINMENT)		57.00 CY	-	-		64	5,290	1,410	6,700
		AQUEOUS AMMONIA STORAGE TANK AND UNLOADING AREA FDNS	S-076	196.00 CY	-	-		221	18,189	4,849	23,038
		PIPE RACK FOUNDATION	S-048	218.00 CY	-	-		245	20,231	5,393	25,624
		AIR COOLED CONDENSER FDN	S-60 REV J	440.00 CY	-	-		495	40,833	10,885	51,718
		AIR COOLED CONDENSER AREA MISC FDN	S-61 REVG	60.00 CY	-	-		68	5,568	1,484	7,052
		FLASH TANK AND TRANSFER PUMP FDN	S-062	23.00 CY	-	-		26	2,134	569	2,703
		CCW HEAT EXCHANGER, PUMP AND HEAD TANK FDNS	S-068	62.00 CY	-	-		70	5,754	1,534	7,287
		FIRE WATER STORAGE TANK FDN	S-070, Steam Plant	25.00 CY	-	-		28	2,320	618	2,939
		FIRE WATER STORAGE TANK FDN	S-070, Other Plant	25.00 CY	-	-		28	2,320	618	2,939
		DEMIN WATER STORAGE TANK FDN	S-070	50.00 CY	-	-		56	4,640	1,237	5,877
		WATER TREATMENT FDNS		130.00 CY	-	-		146	12,064	3,216	15,280
		MISC FDNS		80.00 CY	-	-		90	7,424	1,979	9,403
		CONTROL/ADMINISTRATION BLDG	S-043 Steam Plant @ 50%	352.00 CY	-	-		396	32,666	8,708	41,374
		CONTROL/ADMINISTRATION BLDG	S-043, Other Plant @ 50%	352.00 CY	-	-		396	32,666	8,708	41,374
		SAMPLE BUILDING	DWG S-073	27.00 CY	-	-		30	2,506	668	3,174
		BULK STORAGE BUILDING	S-074 , 50% Steam Plant	28.00 CY	-	-		32	2,598	693	3,291
		BULK STORAGE BUILDING	S-074 , 50% Other Plant	28.00 CY	-	-		32	2,598	693	3,291
		SAMPLE PANEL BUILDING	28'X22'X12 HIGH STEEL BLDG	29.00 CY	-	-		33	2,691	717	3,409
		WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG 50% Steam Plant	28.00 CY	-	-		32	2,598	693	3,291
		WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Other Plant	28.00 CY	-	-		32	2,598	693	3,291
		VISITOR CENTER	24'X64'X10' STEEL BLDG	72.00 CY	-	-		81	6,682	1,781	8,463
		PHOTOVOLTAIC ARRAY SUPPORTS	72 CAISSONS	25.00 CY	-	-		28	2,320	618	2,939
		NEW EQUIPMENT BUILDING	Steam Plant @ 50%	94.00 CY	-	-		106	8,723	2,325	11,049
		NEW EQUIPMENT BUILDING	Other Plant @ 50%	94.00 CY	-	-		106	8,723	2,325	11,049
		NEW WAREHOUSE #3	Steam Plant @ 50%	104.00 CY	-	-		117	9,651	2,573	12,224
		NEW WAREHOUSE #3	Other Plant @ 50%	104.00 CY	-	-		117	9,651	2,573	12,224

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.22.00	CONCRETE									
		TURBINE PEDESTAL	U-1, S-021 REV F	720.00 CY	-	-		1,296	106,907	28,499	135,406
		TURBINE PEDESTAL	U-2, S-025 REV F	720.00 CY	-	-		1,296	106,907	28,499	135,406
		STEAM TURBINE GEN COLUMNS	S-036, S-037	673.00 CY	-	-		1,211	99,928	26,639	126,567
		CONCRETE						**8,496**	**700,817**	**186,822**	**887,639**
	10.23.00	STEEL									
		PIPE RACK	50% Steam Plant S-052,-53,-54 & -55	85.00 TN	-	-		86	6,723	1,456	8,179
		PIPE RACK	50% other plant S-052,-53,-54 & -55	85.00 TN	-	-		86	6,723	1,456	8,179
		MISCELLANEOUS STEEL	CCW PIPE RACK, PIPE SUPPORTS , MISC BRACING ETC.	100.00 TN	-	-		102	7,910	1,713	9,623
		GALLERIES	S-056 + NEW PLATFORMS FOR GENERATOR AND HRSG DOORS	40.00 TN	-	-		41	3,164	685	3,849
		S-056 + NEW PLATFORMS FOR GENERATOR AND HRSG DOORS	PV-1 & 2	10.00 TN	-	-		10	791	171	962
		STEEL						**325**	**25,311**	**5,482**	**30,792**
	10.24.00	ARCHITECTURAL									
		CONTROL/ADMINISTRATION BLDG	188'X79'X12' HIGH STEEL BLDG, 50% Steam Plant	89,112.00 CF	-	-		267	20,029	7,413	27,442
		CONTROL/ADMINISTRATION BLDG	188'X79'X12' HIGH STEEL BLDG, 50% Otther Plant	89,112.00 CF	-	-		267	20,029	7,413	27,442
		SAMPLE BUILDING	30X24X10' HIGH STEEL BLDG	7,200.00 CF	-	-		22	1,618	599	2,217
		BULK STORAGE BUILDING	56'X13'X12 HIGH STEEL BLDG, 50% Steam Plant	4,368.00 CF	-	-		13	982	363	1,345
		BULK STORAGE BUILDING	56'X13'X12 HIGH STEEL BLDG, 50% Other Plant	4,368.00 CF	-	-		13	982	363	1,345
		SAMPLE PANEL BUILDING	28'X22'X12 HIGH STEEL BLDG	7,392.00 CF	-	-		22	1,661	615	2,276
		WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Steam Plant	19,200.00 CF	-	-		58	4,315	1,597	5,913
		WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Other Plant	19,200.00 CF	-	-		58	4,315	1,597	5,913
		VISITOR CENTER (AT PHOTOVOLTAIC FIELD)	24'X64'X10' STEEL BLDG	15,360.00 CF	-	-		46	3,452	1,278	4,730
		NEW EQUIPMENT BUILDING	45'X90'X26' HIGH STEEL BLDG, 50% Steam Plant	52,650.00 CF	-	-		158	11,834	4,380	16,214
		NEW EQUIPMENT BUILDING	45'X90'X26' HIGH STEEL BLDG, 50% Other Plant	52,650.00 CF	-	-		158	11,834	4,380	16,214
		NEW WAREHOUSE #3	45'X100'X21' HIGH STEEL BLDG, 50% Steam Plant	47,250.00 CF	-	-		142	10,620	3,931	14,551
		NEW WAREHOUSE #3	45'X100'X21' HIGH STEEL BLDG, 50% Other Plant	47,250.00 CF	-	-		142	10,620	3,931	14,551
		ARCHITECTURAL						**1,365**	**102,291**	**37,861**	**140,152**
	10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
		MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		500	35,385	11,385	46,770
		MISCELLANEOUS STRUCTURAL ITEM						**500**	**35,385**	**11,385**	**46,770**
	10.31.00	MECHANICAL EQUIPMENT									
		COMBUSTION TURBINE	U-1, SIEMENS STG6-5000F (501FC+)C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS	213.00 TN	-	-		746	52,759	16,975	69,734
		COMBUSTION TURBINE	U-2, SIEMENS STG6-5000F (501FC+)C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS	213.00 TN	-	-		746	52,759	16,975	69,734
		HEAT RECOVERY STEAM GENERATOR	U-1, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	534,030	171,822	705,853
		HEAT RECOVERY STEAM GENERATOR	U-2, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	534,030	171,822	705,853
		STEAM TURBINE GENERATOR	SIEMENS/WESTINGHOUSE	465.00 TN	-	-		1,628	115,178	37,058	152,236

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.31.00	MECHANICAL EQUIPMENT									
		STEAM TURBINE GENERATOR	B33/65CC, 175 MW CONDENSING REHEAT TURBINE W STANDARD ACCESSORIES	465.00 TN	-	-		1,628	115,178	37,058	152,236
		AIR COMPRESSOR, CENTRIFUGAL	2 @ 1335 SCFM STATION	9.00 TN	-	-		18	1,290	415	1,705
		CCW HEAT EXCHANGER	10 CELLS @ 30,000 LB EA	150.00 TN	-	-		304	21,496	6,916	28,413
		DEMIN WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH	30.00 TN	-	-		81	5,732	1,844	7,577
		RAW/FIRE WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH , 50% Steam Plant	15.00 TN	-	-		41	2,866	922	3,788
		RAW/FIRE WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH , 50% Other Plant	15.00 TN	-	-		41	2,866	922	3,788
		AQUEOUS AMMONIA STORAGE TANK	20,000 GALLON,	6.00 TN	-	-		16	1,146	369	1,515
		WATER TREATMENT DEMINERALIZATION & CHEMICAL TREATMENT EQUIPMENT		30.00 TN	-	-		61	4,299	1,383	5,683
		AIR COOLED CONDENSER & ACCESSORIES	250K BUNDLES @ 12 TN EA, 50D BUNDLES @ 10 TN EA & 30-200 HP FANS	3,500.00 TN	-	-		7,088	501,582	161,382	662,965
		BOILER FEED PUMPS	U-1, 2 @ 1350 GPM FOR HRSGS, 2150 HP	22.00 TN	-	-		59	4,204	1,353	5,556
		BOILER FEED PUMPS	U-2, 2 @ 1350 GPM FOR HRSGS, 2150 HP	22.00 TN	-	-		59	4,204	1,353	5,556
		CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-1	3.00 TN	-	-		12	849	273	1,122
		CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-2	3.00 TN	-	-		12	849	273	1,122
		CLOSED COOLING WATER PUMPS	2 @ 7000 GPM @ 213 TDH, 550 HP	4.00 TN	-	-		16	1,132	364	1,497
		CONDENSATE COLLECTION TANK	10,000 GALLON,	4.00 TN	-	-		16	1,132	364	1,497
		FUEL GAS PREHEAT	2 SHELL & TUBE HT EX	1.00 TN	-	-		5	354	114	468
		FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP, Steam Plant	0.80 TN	-	-		4	283	91	374
		FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP, Other Plant	0.80 TN	-	-		4	283	91	374
		MISCELLANEOUS PUMPS	14 SMALL PUMPS E.G. TRANSFER, DEMIN WTR RAW WATER, VACUUM , BLOWDOWN SUMPS AND SUMP PUMPS	2.50 TN	-	-		13	885	285	1,169
		CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.00 TN	-	-		20	1,415	455	1,871
		MECHANICAL EQUIPMENT						**26,079**	**1,845,627**	**593,824**	**2,439,451**
	10.35.00	PIPING									
		PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT, 67 % Steam Plant	182.00 TN	-	-		369	26,082	8,392	34,474
		PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT, 33 % Other Plant	90.00 TN	-	-		182	12,898	4,150	17,048
		PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT, 67% Steam Plant	196.00 TN	-	-		397	28,089	9,037	37,126
		PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT, 33% Other Plant	97.00 TN	-	-		196	13,901	4,473	18,374
		FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Steam Plant	1.00 LT	-	-		40	2,831	911	3,742
		FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Other Plant	1.00 LT	-	-		40	2,831	911	3,742
		PIPING						**1,224**	**86,631**	**27,873**	**114,505**
	10.41.00	ELECTRICAL EQUIPMENT									
		TRANSFORMERS	U-1, U-2, 67% Steam Plant	261.00 TN	-	-		697	49,354	15,880	65,234
		TRANSFORMERS	U-1, U-2, 33% Other Plant	129.00 TN	-	-		345	24,394	7,849	32,242
		MISC ELECT EQUIPMENT	U-1, U-2, 33% Other Plant	60.00 TN	-	-		160	11,346	3,650	14,996
		MISC ELECT EQUIPMENT	U-1, U-2, 67% Steam Plant	122.00 TN	-	-		326	23,070	7,423	30,493
		OUTDOOR LIGHT POLE / FIXTURE	U-0	1.00 LT	-	-		150	10,616	3,416	14,031
		ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Steam Plant	1.00 LT	-	-		50	3,539	1,139	4,677
		ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Other Plant	1.00 LT	-	-		50	3,539	1,139	4,677
		ELECTRICAL EQUIPMENT						**1,778**	**125,856**	**40,494**	**166,350**
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
		CONDUIT	Steam Plant 67% U-1	30,150.00 LF	-	-		302	21,337	6,865	28,202
		CONDUIT	Other Plant 33% U-1	14,850.00 LF	-	-		149	10,509	3,381	13,891
		CONDUIT	Steam Plant 67% U-2	30,150.00 LF	-	-		302	21,337	6,865	28,202
		CONDUIT	Other Plant 33% U-2	14,850.00 LF	-	-		149	10,509	3,381	13,891
		CABLE TRAY	Steam Plant 67% U-1	1,675.00 LF	-	-		67	4,742	1,526	6,267
		CABLE TRAY	Other Plant 33% U-1	825.00 LF	-	-		33	2,335	751	3,087

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
		CABLE TRAY	Steam Plant 67% U-2	1,675.00 LF	-	-		67	4,742	1,526	6,267
		CABLE TRAY	Other Plant 33% U-2	825.00 LF	-	-		33	2,335	751	3,087
		RACEWAY, CABLE TRAY, & CONDUIT						1,100	77,847	25,047	102,894
	10.43.00	CABLE									
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-1	19,430.00 LF	-	-		194	13,751	4,424	18,175
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-1	9,570.00 LF	-	-		96	6,773	2,179	8,952
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-2	19,430.00 LF	-	-		194	13,751	4,424	18,175
		COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-2	9,570.00 LF	-	-		96	6,773	2,179	8,952
		COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-1	67,000.00 LF	-	-		335	23,708	7,628	31,336
		COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-1	33,000.00 LF	-	-		165	11,677	3,757	15,434
		COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-2	67,000.00 LF	-	-		335	23,708	7,628	31,336
		COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-2	33,000.00 LF	-	-		165	11,677	3,757	15,434
		CABLE						1,580	111,817	35,977	147,793
	10.44.00	CONTROL & INSTRUMENTATION									
		CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	7,077	2,277	9,354
		CONTROL & INSTRUMENTATION						100	7,077	2,277	9,354
		WHOLE PLANT DEMOLITION						**45,045**	**3,323,442**	**1,082,369**	**4,405,811**
18.00.00		**SCRAP VALUE**									
	18.10.00	MIXED STEEL									
		CARBON STEEL		-4,526.00 TN	-	(792,050)	-				(792,050)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-79.00 TN	-	(13,825)	-				(13,825)
		CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-39.00 TN	-	(6,825)	-				(6,825)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-10.00 TN	-	(1,750)	-				(1,750)
		CARBON STEEL	CABLE TRAY, 6 LBS/LF	-4.95 TN	-	(866)	-				(866)
		CARBON STEEL		-4,601.00 TN	-	(805,175)	-				(805,175)
		CARBON STEEL		-11.50 TN	-	(2,012)	-				(2,012)
		CARBON STEEL		-10.80 TN	-	(1,890)	-				(1,890)
		CARBON STEEL		-101.80 TN	-	(17,815)	-				(17,815)
		CARBON STEEL		-659.00 TN	-	(115,325)	-				(115,325)
		CARBON STEEL	MISC ELECT EQUIPMENT	-60.00 TN	-	(10,500)	-				(10,500)
		CARBON STEEL	BUILDINGS	-80.00 TN	-	(14,000)	-				(14,000)
		CARBON STEEL	BUILDINGS	-80.00 TN	-	(14,000)	-				(14,000)
		CARBON STEEL	FENCE	-20.00 TN	-	(3,500)	-				(3,500)
		CARBON STEEL	MISC ELECT EQUIPMENT	-122.00 TN	-	(21,350)	-				(21,350)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-261.00 TN	-	(91,350)	-				(91,350)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-129.00 TN	-	(45,150)	-				(45,150)
		MIXED STEEL				(1,957,384)					(1,957,384)
	18.30.00	COPPER									
		#2 SOLID COPPER / TUBING	BUS BAR	-0.67 TN	-	(4,117)	-				(4,117)
		#2 SOLID COPPER / TUBING	BUS BAR	-0.33 TN	-	(2,028)	-				(2,028)
		#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-				(9,760)
		#2 INSULATED COPPER WIRE		-2.00 TN	-	(4,880)	-				(4,880)
		COPPER				(20,785)					(20,785)
		SCRAP VALUE				**(1,978,169)**					**(1,978,169)**
21.00.00		**CIVIL WORK**									
	21.17.00	EXCAVATION									
		EXCAVATION, BULLDOZER	LEVEL POND BERMS	190,163.00 CY	-	-		5,705	483,204	547,555	1,030,760
		EXCAVATION						5,705	483,204	547,555	1,030,760
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	662.00 CY	13,240	-					13,240
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,636.00 CY	32,720	-					32,720
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED.	1,312.00 CY	26,240	-					26,240

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	21.18.00	HAULING									
		HAULING TO RECYCLE FACILITY	NO DISPOSAL FEE	1,312.00 CY	26,240	-					26,240
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	170.00 CY	3,400	-					3,400
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	119.00 CY	2,380	-					2,380
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	703.00 CY	14,060	-					14,060
		HAULING TO RECYCLE FACILITY	CONCRETE PAVING DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,505.00 CY	30,100	-					30,100
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	25.00 CY	500	-					500
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,440.00 CY	28,800	-					28,800
		HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	217.00 CY	4,340	-					4,340
		HAULING TO RECYCLE FACILITY	CONCRETE PAVING DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,505.00 CY	30,100	-					30,100
		HAULING			185,880						185,880
	21.21.00	MASS FILL									
		MASS FILL, COMMON EARTH 6 INCHES THICK		86,981.00 CY	-	-	1,221,213	3,044	257,855	292,195	1,771,264
		MASS FILL, COMMON EARTH 6 INCHES THICK, C/T SPECIFIC OTHER PLANT		607.00 CY	-	-	8,522	21	1,799	2,039	12,361
		MASS FILL, COMMON EARTH 6 INCHES THICK, PHOTOVOLTAIC PLANT		1,146.00 CY	-	-	16,090	40	3,397	3,850	23,337
		MASS FILL					1,245,825	3,106	263,052	298,084	1,806,961
	21.52.00	WASTE DISPOSAL									
		DISPOSAL AND TRANSPORTATION FEE	CONCRETE DEBRIS, DISPOSED ON SITE	CY		-					
		DISPOSAL AND TRANSPORTATION FEE	RUBBISH &TENANT DEBRIS	2,250.00 CY	67,500	-					67,500
		WASTE DISPOSAL			67,500						67,500
		CIVIL WORK			**253,380**		**1,245,825**	**8,811**	**746,256**	**845,639**	**3,091,101**

APPENDIX B. CONCEPTUAL COST ESTIMATE — FERC ACCOUNTS

Estimator	GA
Labor rate table	21NVLAS
Project No.	A14520.001
Estimate Date	3/12/2022
Reviewed By	BA
Approved By	BA
Estimate No.	31088D

SAN DIEGO GAS & ELECTRIC
DESERT STAR
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Area	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
311	STRUCTURES AND IMPROVEMENTS	141,134	(17,500)	1,910,307	6,255	989,139	648,508	3,671,588
312	BOILER PLANT EQUIPMENT	41,663	(792,050)		17,132	2,365,834	627,946	2,243,392
314	TURBO GENERATOR UNITS	33,412	(805,175)		11,852	1,655,531	433,007	1,316,775
315	ACCESSORY ELECTRIC EQUIPMENT	4,329	(142,152)		3,160	433,782	116,124	412,082
316	MISCELLANEOUS POWER PLANT EQUIPMENT	3,030	(2,012)		205	30,818	7,365	39,201
341	OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS	56,230	(15,890)	38,500	8,379	1,339,656	1,036,579	2,455,075
342	OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES	637	(17,815)		164	24,093	5,177	12,092
344	OTHER PRODUCTION - GENERATORS	36,672	(115,325)		5,026	741,969	181,419	844,735
345	OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT	5,526	(70,249)		1,684	234,288	61,683	231,248

SAN DIEGO GAS & ELECTRIC
DESERT STAR
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Estimate Totals

Description	Amount	Totals	Hours
Labor	7,815,109		53,856
Material	1,948,807		
Subcontract	322,633		
Construction Equipment	3,117,808		
Process Equipment	(1,978,169)		
	11,226,188	11,226,188	
General Conditions			
Additional Labor Costs			
Site Overheads			
Other Construction Indirects			
		11,226,188	
Project Indirect Costs			
		11,226,188	
Contingency			
		11,226,188	
Escalation			
		11,226,188	
Total		**11,226,188**	

General Conditions, Indirect Costs and Contingency are allocated in the line items above.

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
311			STRUCTURES AND IMPROVEMENTS									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			REMOVE FENCE		8,260.00 LF	-	-		330	52,027	24,674	76,700
			PAVED SURFACES, 6 IN THICK	STEAM PLANT	9,029.00 SY	-	-		1,083	170,611	80,912	251,524
			CIVIL WORK						1,414	222,638	105,586	328,224
		10.22.00	CONCRETE									
			AQUEOUS AMMONIA STORAGE TANK AND UNLOADING AREA FDNS	S-076	196.00 CY	-	-		221	34,929	7,841	42,770
			CONTROL/ADMINISTRATION BLDG	S-043 Steam Plant @ 50%	352.00 CY	-	-		396	62,729	14,082	76,811
			SAMPLE BUILDING	DWG S-073	27.00 CY	-	-		30	4,812	1,080	5,892
			BULK STORAGE BUILDING	S-074 , 50% Steam Plant	28.00 CY	-	-		32	4,990	1,120	6,110
			SAMPLE PANEL BUILDING	28'X22'X12 HIGH STEEL BLDG	29.00 CY	-	-		33	5,168	1,160	6,328
			WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG 50% Steam Plant	28.00 CY	-	-		32	4,990	1,120	6,110
			NEW EQUIPMENT BUILDING	Steam Plant @ 50%	94.00 CY	-	-		106	16,752	3,761	20,512
			NEW WAREHOUSE #3	Steam Plant @ 50%	104.00 CY	-	-		117	18,534	4,161	22,694
			CONCRETE						965	152,902	34,325	187,227
		10.24.00	ARCHITECTURAL									
			CONTROL/ADMINISTRATION BLDG	188'X79'X12' HIGH STEEL BLDG, 50% Steam Plant	89,112.00 CF	-	-		267	38,462	11,988	50,450
			SAMPLE BUILDING	30X24X10' HIGH STEEL BLDG	7,200.00 CF	-	-		22	3,108	969	4,076
			BULK STORAGE BUILDING	56'X13'X12 HIGH STEEL BLDG, 50% Steam Plant	4,368.00 CF	-	-		13	1,885	588	2,473
			SAMPLE PANEL BUILDING	28'X22'X12 HIGH STEEL BLDG	7,392.00 CF	-	-		22	3,190	994	4,185
			WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Steam Plant	19,200.00 CF	-	-		58	8,287	2,583	10,870
			NEW EQUIPMENT BUILDING	45'X90'X26' HIGH STEEL BLDG, 50% Steam Plant	52,650.00 CF	-	-		158	22,724	7,083	29,807
			NEW WAREHOUSE #3	45'X100'X21' HIGH STEEL BLDG, 50% Steam Plant	47,250.00 CF	-	-		142	20,394	6,356	26,750
			ARCHITECTURAL						682	98,050	30,561	128,611
		10.41.00	ELECTRICAL EQUIPMENT									
			OUTDOOR LIGHT POLE / FIXTURE	U-0	1.00 LT	-	-		150	20,385	5,523	25,908
			ELECTRICAL EQUIPMENT						150	20,385	5,523	25,908
			WHOLE PLANT DEMOLITION						3,211	493,975	175,995	669,970
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	BUILDINGS	-80.00 TN	-	(14,000)	-				(14,000)
			CARBON STEEL	FENCE	-20.00 TN	-	(3,500)	-				(3,500)
			MIXED STEEL				(17,500)					(17,500)
			SCRAP VALUE				(17,500)					(17,500)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	662.00 CY	16,859	-					16,859
			HAULING TO RECYCLE FACILITY	CONCRETE PAVING DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,505.00 CY	38,327	-					38,327
			HAULING			55,186						55,186
		21.21.00	MASS FILL									
			MASS FILL, COMMON EARTH 6 INCHES THICK	OFFSITE SUPPLY - 10 MILE ROUND TRIP AND SPREADING	86,981.00 CY	-	-	1,910,307	3,044	495,164	472,513	2,877,984
			MASS FILL					1,910,307	3,044	495,164	472,513	2,877,984
		21.52.00	WASTE DISPOSAL									
			DISPOSAL AND TRANSPORTATION FEE	CONCRETE DEBRIS, DISPOSED ON SITE	CY		-					
			DISPOSAL AND TRANSPORTATION FEE	RUBBISH &TENANT DEBRIS	2,250.00 CY	85,949	-					85,949
			WASTE DISPOSAL			85,949						85,949
			CIVIL WORK			141,134		1,910,307	3,044	495,164	472,513	3,019,118
			311 STRUCTURES AND IMPROVEMENTS			141,134	(17,500)	1,910,307	6,255	989,139	648,508	3,671,588
312			BOILER PLANT EQUIPMENT									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.22.00	CONCRETE									
			HRSG / STACK FDN	U-1, S-030 REV D	480.00 CY	-	-		540	85,540	19,203	104,742
			HRSG / STACK FDN	U-2, S-033 REV D	480.00 CY	-	-		540	85,540	19,203	104,742
			CEMS ENCLOSURE	U-1, S-031 REVD, 8'X21'X1'	6.00 CY	-	-		7	1,069	240	1,309
			CEMS ENCLOSURE	U-12 S-031 REVD, 8'X21'X1'	6.00 CY	-	-		7	1,069	240	1,309
			BOILER FEED PUMPS (4)	S-034 HRSG FOUNDATION AREA	33.00 CY	-	-		37	5,881	1,320	7,201
			SCR SKID	S-034 HRSG FOUNDATION AREA	8.00 CY	-	-		9	1,426	320	1,746
			BURNER SKID	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	178	40	218
			BURNER BLOWER SKID	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	178	40	218
			BLOWDOWN TANK	S-034 HRSG FOUNDATION AREA	2.00 CY	-	-		2	356	80	436
			PIPE RACK FOUNDATION	S-048	218.00 CY	-	-		245	38,849	8,721	47,570
			FIRE WATER STORAGE TANK FDN	S-070, Steam Plant	25.00 CY	-	-		28	4,455	1,000	5,455
			DEMIN WATER STORAGE TANK FDN	S-070	50.00 CY	-	-		56	8,910	2,000	10,911
			WATER TREATMENT FDNS		130.00 CY	-	-		146	23,167	5,201	28,368
			CONCRETE						1,620	256,619	57,608	314,227
		10.23.00	STEEL									
			PIPE RACK	50% Steam Plant S-052,-53,-54 & -55	85.00 TN	-	-		86	12,911	2,355	15,265
			STEEL						86	12,911	2,355	15,265
		10.31.00	MECHANICAL EQUIPMENT									
			HEAT RECOVERY STEAM GENERATOR	U-1, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	1,025,508	277,856	1,303,364
			HEAT RECOVERY STEAM GENERATOR	U-2, 3-PRESS HRSG W/REHEAT SUPPLEMENTAL DUCT BURNERS INCL INTERGRAL DEAERATOR, SCR INC 110' STACK	2,156.00 TN	-	-		7,546	1,025,508	277,856	1,303,364
			DEMIN WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH	30.00 TN	-	-		81	11,008	2,983	13,991
			RAW/FIRE WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH , 50% Steam Plant	15.00 TN	-	-		41	5,504	1,491	6,995
			AQUEOUS AMMONIA STORAGE TANK	20,000 GALLON,	6.00 TN	-	-		16	2,202	597	2,798
			WATER TREATMENT DEMINERALIZATION & CHEMICAL TREATMENT EQUIPMENT		30.00 TN	-	-		61	8,256	2,237	10,493
			BOILER FEED PUMPS	U-1, 2 @ 1350 GPM FOR HRSGS, 2150 HP	22.00 TN	-	-		59	8,073	2,187	10,260
			BOILER FEED PUMPS	U-2, 2 @ 1350 GPM FOR HRSGS, 2150 HP	22.00 TN	-	-		59	8,073	2,187	10,260
			CONDENSATE COLLECTION TANK	10,000 GALLON,	4.00 TN	-	-		16	2,174	589	2,764
			MECHANICAL EQUIPMENT						15,425	2,096,304	567,983	2,664,287
			WHOLE PLANT DEMOLITION						17,132	2,365,834	627,946	2,993,779
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-4,526.00 TN	-	(792,050)	-				(792,050)
			MIXED STEEL				(792,050)					(792,050)
			SCRAP VALUE				(792,050)					(792,050)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,636.00 CY	41,663	-					41,663
			HAULING			41,663						41,663
			CIVIL WORK			41,663						41,663
			312 BOILER PLANT EQUIPMENT			**41,663**	**(792,050)**		**17,132**	**2,365,834**	**627,946**	**2,243,392**
314			**TURBO GENERATOR UNITS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			EXCITATION SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	6.00 CY	-	-		7	1,069	240	1,309
			EXCITATION TRANSFORMER	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	4.00 CY	-	-		5	713	160	873
			STEAM TURBINE LUBE OIL MODULE	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	24.00 CY	-	-		27	4,277	960	5,237
			SEAL OIL SUPPLY SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	8.00 CY	-	-		9	1,426	320	1,746
			GLAND STEAM CONDENSER SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	3.00 CY	-	-		3	535	120	655
			GLAND STEAM SUPPLY SKID	S-039 STEAM TURBINE/GENERATOR EQUIPMENT FDNS	9.00 CY	-	-		10	1,604	360	1,964
			AIR COOLED CONDENSER FDN	S-60 REV J	440.00 CY	-	-		495	78,411	17,602	96,014
			AIR COOLED CONDENSER AREA MISC FDN	S-61 REV J	60.00 CY	-	-		68	10,692	2,400	13,093

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.22.00	CONCRETE									
			FLASH TANK AND TRANSFER PUMP FDN	S-062	23.00 CY	-	-		26	4,099	920	5,019
			CCW HEAT EXCHANGER, PUMP AND HEAD TANK FDNS	S-068	62.00 CY	-	-		70	11,049	2,480	13,529
			STEAM TURBINE GEN COLUMNS	S-036, S-037	673.00 CY	-	-		1,211	191,894	43,078	234,972
			CONCRETE						1,930	305,769	68,641	374,410
		10.23.00	STEEL									
			MISCELLANEOUS STEEL	CCW PIPE RACK, PIPE SUPPORTS , MISC BRACING ETC.	100.00 TN	-	-		102	15,189	2,770	17,959
			STEEL						102	15,189	2,770	17,959
		10.31.00	MECHANICAL EQUIPMENT									
			STEAM TURBINE GENERATOR	SIEMENS/WESTINGHOUSE B33/65CC, 175 MW CONDENSING REHEAT TURBINE W STANDARD ACCESSORIES	465.00 TN	-	-		1,628	221,179	59,927	281,106
			CCW HEAT EXCHANGER	10 CELLS @ 30,000 LB EA	150.00 TN	-	-		304	41,280	11,185	52,465
			AIR COOLED CONDENSER & ACCESSORIES	250K BUNDLES @ 12 TN EA, 50D BUNDLES @ 10 TN EA & 30-200 HP FANS	3,500.00 TN	-	-		7,088	963,197	260,974	1,224,171
			CLOSED COOLING WATER PUMPS	2 @ 7000 GPM @ 213 TDH, 550 HP	4.00 TN	-	-		16	2,174	589	2,764
			CONDENSATE PUMPS	U-0, 3 @ 1400 GPM & 625 TDH, 300 HP	4.00 TN	-	-		20	2,718	736	3,454
			MECHANICAL EQUIPMENT						9,055	1,230,548	333,411	1,563,959
		10.35.00	PIPING									
			PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT, 67 % Steam Plant	182.00 TN	-	-		369	50,086	13,571	63,657
			PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT, 67% Steam Plant	196.00 TN	-	-		397	53,939	14,615	68,554
			PIPING						765	104,025	28,185	132,210
			WHOLE PLANT DEMOLITION						11,852	1,655,531	433,007	2,088,538
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-4,601.00 TN	-	(805,175)	-				(805,175)
			MIXED STEEL				(805,175)					(805,175)
			SCRAP VALUE				(805,175)					(805,175)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,312.00 CY	33,412	-					33,412
			HAULING			33,412						33,412
			CIVIL WORK			33,412						33,412
			314 TURBO GENERATOR UNITS			**33,412**	**(805,175)**		**11,852**	**1,655,531**	**433,007**	**1,316,775**
315			**ACCESSORY ELECTRIC EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			MAIN & AUX TRANSFORMER FDNS	S-045 MAIN & AUX TRANSFORMERS (1)	148.00 CY	-	-		167	26,375	5,921	32,296
			SPARE TRANSFORMER (ALSTOM) PAD AND CONTAINMENT)		22.00 CY	-	-		25	3,921	880	4,801
			CONCRETE						191	30,295	6,801	37,096
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	U-1, U-2, 67% Steam Plant	261.00 TN	-	-		697	94,776	25,679	120,455
			MISC ELECT EQUIPMENT	U-1, U-2, 67% Steam Plant	122.00 TN	-	-		326	44,302	12,003	56,305
			ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Steam Plant	1.00 LT	-	-		50	6,795	1,841	8,636
			ELECTRICAL EQUIPMENT						1,073	145,873	39,524	185,396
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT	Steam Plant 67% U-1	30,150.00 LF	-	-		302	40,974	11,102	52,076
			CONDUIT	Steam Plant 67% U-2	30,150.00 LF	-	-		302	40,974	11,102	52,076
			CABLE TRAY	Steam Plant 67% U-1	1,675.00 LF	-	-		67	9,105	2,467	11,572
			CABLE TRAY	Steam Plant 67% U-2	1,675.00 LF	-	-		67	9,105	2,467	11,572
			RACEWAY, CABLE TRAY, & CONDUIT						737	100,159	27,138	127,297
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-1	19,430.00 LF	-	-		194	26,406	7,154	33,560
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Steam Plant 67% U-2	19,430.00 LF	-	-		194	26,406	7,154	33,560
			COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-1	67,000.00 LF	-	-		335	45,527	12,335	57,862
			COPPER WIRE / CABLE - LOW VOLTAGE	Steam Plant 67% U-2	67,000.00 LF	-	-		335	45,527	12,335	57,862
			CABLE						1,059	143,865	38,979	182,844

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.44.00	CONTROL & INSTRUMENTATION									
			CONTROL & INSTRUMENTATION		1.00 LT	-	-		100	13,590	3,682	17,272
			CONTROL & INSTRUMENTATION						100	13,590	3,682	17,272
			WHOLE PLANT DEMOLITION						3,160	433,782	116,124	549,905
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-79.00 TN	-	(13,825)	-				(13,825)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-10.00 TN	-	(1,750)	-				(1,750)
			CARBON STEEL	MISC ELECT EQUIPMENT	-122.00 TN	-	(21,350)	-				(21,350)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-261.00 TN	-	(91,350)	-				(91,350)
			MIXED STEEL				(128,275)					(128,275)
		18.30.00	COPPER									
			#2 SOLID COPPER / TUBING	BUS BAR	-0.67 TN	-	(4,117)	-				(4,117)
			#2 INSULATED COPPER WIRE		-4.00 TN	-	(9,760)	-				(9,760)
			COPPER				(13,877)					(13,877)
			SCRAP VALUE				(142,152)					(142,152)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	170.00 CY	4,329	-					4,329
			HAULING			4,329						4,329
			CIVIL WORK			4,329						4,329
			315 ACCESSORY ELECTRIC EQUIPMENT			4,329	(142,152)		3,160	433,782	116,124	412,082
316			MISCELLANEOUS POWER PLANT EQUIPMENT									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			AIR COMPRESSOR	S-034 HRSG FOUNDATION AREA	3.00 CY	-	-		3	535	120	655
			AIR DRYER	S-034 HRSG FOUNDATION AREA	1.00 CY	-	-		1	178	40	218
			AIR RECEIVER	S-034 HRSG FOUNDATION AREA	35.00 CY	-	-		39	6,237	1,400	7,637
			MISC FDNS		80.00 CY	-	-		90	14,257	3,200	17,457
			CONCRETE						134	21,207	4,761	25,967
		10.31.00	MECHANICAL EQUIPMENT									
			AIR COMPRESSOR, CENTRIFUGAL	2 @ 1335 SCFM STATION	9.00 TN	-	-		18	2,477	671	3,148
			MISCELLANEOUS PUMPS	14 SMALL PUMPS E.G. TRANSFER, DEMIN WTR RAW WATER, VACUUM , BLOWDOWN SUMPS AND SUMP PUMPS	2.50 TN	-	-		13	1,699	460	2,159
			MECHANICAL EQUIPMENT						31	4,176	1,131	5,307
		10.35.00	PIPING									
			FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Steam Plant	1.00 LT	-	-		40	5,436	1,473	6,909
			PIPING						40	5,436	1,473	6,909
			WHOLE PLANT DEMOLITION						205	30,818	7,365	38,183
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-11.50 TN	-	(2,012)	-				(2,012)
			MIXED STEEL				(2,012)					(2,012)
			SCRAP VALUE				(2,012)					(2,012)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	119.00 CY	3,030	-					3,030
			HAULING			3,030						3,030
			CIVIL WORK			3,030						3,030
			316 MISCELLANEOUS POWER PLANT EQUIPMENT			3,030	(2,012)		205	30,818	7,365	39,201
341			OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS									

SAN DIEGO GAS & ELECTRIC
DESERT STAR
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			PAVED SURFACES, 6 IN THICK	OTHER PRODUCTION	9,029.00 SY	-	-		1,083	170,611	80,912	251,524
			CIVIL WORK						1,083	170,611	80,912	251,524
		10.22.00	CONCRETE									
			CONTROL/ADMINISTRATION BLDG	S-043, Other Plant @ 50%	352.00 CY	-	-		396	62,729	14,082	76,811
			BULK STORAGE BUILDING	S-074 , 50% Other Plant	28.00 CY	-	-		32	4,990	1,120	6,110
			WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Other Plant	28.00 CY	-	-		32	4,990	1,120	6,110
			VISITOR CENTER	24'X64'X10' STEEL BLDG	72.00 CY	-	-		81	12,831	2,880	15,711
			PHOTOVOLTAIC ARRAY SUPPORTS	72 CAISSONS	25.00 CY	-	-		28	4,455	1,000	5,455
			NEW EQUIPMENT BUILDING	Other Plant @ 50%	94.00 CY	-	-		106	16,752	3,761	20,512
			NEW WAREHOUSE #3	Other Plant @ 50%	104.00 CY	-	-		117	18,534	4,161	22,694
			CONCRETE						791	125,280	28,124	153,404
		10.23.00	STEEL									
			S-056 + NEW PLATFORMS FOR GENERATOR AND HRSG DOORS	PV-1 & 2	10.00 TN	-	-		10	1,519	277	1,796
			STEEL						10	1,519	277	1,796
		10.24.00	ARCHITECTURAL									
			CONTROL/ADMINISTRATION BLDG	188'X79'X12' HIGH STEEL BLDG, 50% Otther Plant	89,112.00 CF	-	-		267	38,462	11,988	50,450
			BULK STORAGE BUILDING	56'X13'X12 HIGH STEEL BLDG, 50% Other Plant	4,368.00 CF	-	-		13	1,885	588	2,473
			WAREHOUSE #2	30'X40'X24' HIGH STEEL BLDG, 50% Other Plant	19,200.00 CF	-	-		58	8,287	2,583	10,870
			VISITOR CENTER (AT PHOTOVOLTAIC FIELD)	24'X64'X10' STEEL BLDG	15,360.00 CF	-	-		46	6,630	2,066	8,696
			NEW EQUIPMENT BUILDING	45'X90'X26' HIGH STEEL BLDG, 50% Other Plant	52,650.00 CF	-	-		158	22,724	7,083	29,807
			NEW WAREHOUSE #3	45'X100'X21' HIGH STEEL BLDG, 50% Other Plant	47,250.00 CF	-	-		142	20,394	6,356	26,750
			ARCHITECTURAL						684	98,381	30,664	129,045
		10.31.00	MECHANICAL EQUIPMENT									
			FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP, Other Plant	0.80 TN	-	-		4	544	147	691
			MECHANICAL EQUIPMENT						4	544	147	691
		10.35.00	PIPING									
			FIRE LINES & HYDRANTS	U-0, ABANDON UNDERGND LINES REMOVE HYDRANTS, 50% Other Plant	1.00 LT	-	-		40	5,436	1,473	6,909
			PIPING						40	5,436	1,473	6,909
			WHOLE PLANT DEMOLITION						2,612	401,771	141,598	543,369
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-10.80 TN	-	(1,890)	-				(1,890)
			CARBON STEEL	BUILDINGS	-80.00 TN	-	(14,000)	-				(14,000)
			MIXED STEEL				(15,890)					(15,890)
			SCRAP VALUE				(15,890)					(15,890)
	21.00.00		CIVIL WORK									
		21.17.00	EXCAVATION									
			EXCAVATION, BULLDOZER	LEVEL POND BERMS	190,163.00 CY	-	-		5,705	927,905	885,459	1,813,364
			EXCAVATION						5,705	927,905	885,459	1,813,364
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	703.00 CY	17,903	-					17,903
			HAULING TO RECYCLE FACILITY	CONCRETE PAVING DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,505.00 CY	38,327	-					38,327
			HAULING			56,230						56,230
		21.21.00	MASS FILL									
			MASS FILL, COMMON EARTH 6 INCHES THICK, C/T SPECIFIC OTHER PLANT	OFFSITE SUPPLY - 10 MILE ROUND TRIP AND SPREADING	607.00 CY	-	-	13,331	21	3,456	3,297	20,084
			MASS FILL, COMMON EARTH 6 INCHES THICK, PHOTOVOLTAIC PLANT	OFFSITE SUPPLY - 10 MILE ROUND TRIP AND SPREADING	1,146.00 CY	-	-	25,169	40	6,524	6,226	37,918

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			MASS FILL					38,500	61	9,979	9,523	58,002
			CIVIL WORK			56,230		38,500	5,766	937,885	894,982	1,927,596
			341 OTHER PRODUCTION - STRUCTURES & IMPROVEMENTS			**56,230**	**(15,890)**	**38,500**	**8,379**	**1,339,656**	**1,036,579**	**2,455,075**
342			**OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			FIRE WATER STORAGE TANK FDN	S-070, Other Plant	25.00 CY	-	-		28	4,455	1,000	5,455
			CONCRETE						28	4,455	1,000	5,455
		10.23.00	STEEL									
			PIPE RACK	50% other plant S-052,-53,-54 & -55	85.00 TN	-	-		86	12,911	2,355	15,265
			STEEL						86	12,911	2,355	15,265
		10.31.00	MECHANICAL EQUIPMENT									
			RAW/FIRE WATER STORAGE TANK	250,000 GALLON, 38' DIA X 30' HIGH , 50% Other Plant	15.00 TN	-	-		41	5,504	1,491	6,995
			FUEL GAS PREHEAT	2 SHELL & TUBE HT EX	1.00 TN	-	-		5	680	184	864
			FIRE PUMPS	U-0, 2 @ 1500 GPM @ 125 PSI, 300 HP, Steam Plant	0.80 TN	-	-		4	544	147	691
			MECHANICAL EQUIPMENT						50	6,727	1,823	8,550
			WHOLE PLANT DEMOLITION						164	24,093	5,177	29,270
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-101.80 TN	-	(17,815)	-				(17,815)
			MIXED STEEL				(17,815)					(17,815)
			SCRAP VALUE				(17,815)					(17,815)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	25.00 CY	637	-					637
			HAULING			637						637
			CIVIL WORK			637						637
			342 OTHER PRODUCTION - FUEL HOLDERS, PRODUCERS AND ACCESSORIES			**637**	**(17,815)**		**164**	**24,093**	**5,177**	**12,092**
344			**OTHER PRODUCTION - GENERATORS**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			TURBINE PEDESTAL	U-1, S-021 REV F	720.00 CY	-	-		1,296	205,295	46,086	251,382
			TURBINE PEDESTAL	U-2, S-025 REV F	720.00 CY	-	-		1,296	205,295	46,086	251,382
			CONCRETE						2,592	410,591	92,172	502,763
		10.23.00	STEEL									
			GALLERIES	S-056 + NEW PLATFORMS FOR GENERATOR AND HRSG DOORS	40.00 TN	-	-		41	6,076	1,108	7,184
			STEEL						41	6,076	1,108	7,184
		10.26.00	MISCELLANEOUS STRUCTURAL ITEM									
			MISCELLANEOUS SMALL OBSTACLE REMOVAL FROM SITE		1.00 LT	-	-		500	67,950	18,411	86,361
			MISCELLANEOUS STRUCTURAL ITEM						500	67,950	18,411	86,361
		10.31.00	MECHANICAL EQUIPMENT									
			COMBUSTION TURBINE	U-1, SIEMENS STG6-5000F (501FC+)C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS	213.00 TN	-	-		746	101,314	27,451	128,765
			COMBUSTION TURBINE	U-2, SIEMENS STG6-5000F (501FC+)C/T - NOMINAL 170 MW, FIRING NATURAL GAS ONLY, W DRY LOW NOX BURNERS	213.00 TN	-	-		746	101,314	27,451	128,765
			CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-1	3.00 TN	-	-		12	1,631	442	2,073
			CT LUBE OIL SYSTEM INCL FIN FAN COOLER	U-2	3.00 TN	-	-		12	1,631	442	2,073
			MECHANICAL EQUIPMENT						1,515	205,890	55,785	261,675

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
		10.35.00	PIPING									
			PIPING, VALVES AND HANGERS	U1, 14,000 LF/UNIT, 33 % Other Plant	90.00 TN	-	-		182	24,768	6,711	31,479
			PIPING, VALVES AND HANGERS	U2, 14,300 LF/UNIT, 33% Other Plant	97.00 TN	-	-		196	26,694	7,233	33,927
			PIPING						379	51,462	13,943	65,406
			WHOLE PLANT DEMOLITION						5,026	741,969	181,419	923,388
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL		-659.00 TN	-	(115,325)	-				(115,325)
			MIXED STEEL				(115,325)					(115,325)
			SCRAP VALUE				(115,325)					(115,325)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	1,440.00 CY	36,672	-					36,672
			HAULING			36,672						36,672
			CIVIL WORK			36,672						36,672
			344 OTHER PRODUCTION - GENERATORS			**36,672**	**(115,325)**		**5,026**	**741,969**	**181,419**	**844,735**
345			**OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.22.00	CONCRETE									
			MAIN & AUX TRANSFORMER FDNS	S-047 MAIN & AUX TRANSFORMERS (2)	160.00 CY	-	-		180	28,513	6,401	34,914
			SPARE TRANSFORMER (ALSTOM) PAD AND CONTAINMENT)		57.00 CY	-	-		64	10,158	2,280	12,438
			CONCRETE						244	38,671	8,681	47,352
		10.41.00	ELECTRICAL EQUIPMENT									
			TRANSFORMERS	U-1, U-2, 33% Other Plant	129.00 TN	-	-		345	46,843	12,692	59,535
			MISC ELECT EQUIPMENT	U-1, U-2, 33% Other Plant	60.00 TN	-	-		160	21,788	5,903	27,691
			ELECTRICAL EQUIPMENT	U-0, CONTROL RM, 50% Other Plant	1.00 LT	-	-		50	6,795	1,841	8,636
			ELECTRICAL EQUIPMENT						555	75,426	20,436	95,862
		10.42.00	RACEWAY, CABLE TRAY, & CONDUIT									
			CONDUIT	Other Plant 33% U-1	14,850.00 LF	-	-		149	20,181	5,468	25,649
			CONDUIT	Other Plant 33% U-2	14,850.00 LF	-	-		149	20,181	5,468	25,649
			CABLE TRAY	Other Plant 33% U-1	825.00 LF	-	-		33	4,485	1,215	5,700
			CABLE TRAY	Other Plant 33% U-2	825.00 LF	-	-		33	4,485	1,215	5,700
			RACEWAY, CABLE TRAY, & CONDUIT						363	49,332	13,366	62,698
		10.43.00	CABLE									
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-1	9,570.00 LF	-	-		96	13,006	3,524	16,530
			COPPER WIRE / CABLE - MEDIUM VOLTAGE	Other Plant 33% U-2	9,570.00 LF	-	-		96	13,006	3,524	16,530
			COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-1	33,000.00 LF	-	-		165	22,424	6,076	28,499
			COPPER WIRE / CABLE - LOW VOLTAGE	Other Plant 33% U-2	33,000.00 LF	-	-		165	22,424	6,076	28,499
			CABLE						521	70,859	19,199	90,058
			WHOLE PLANT DEMOLITION						1,684	234,288	61,683	295,970
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			CARBON STEEL	CONDUIT, 1.5" DIA. AVG SIZE, 2.63 LBS/LF	-39.00 TN	-	(6,825)	-				(6,825)
			CARBON STEEL	CABLE TRAY, 6 LBS/LF	-4.95 TN	-	(866)	-				(866)
			CARBON STEEL	MISC ELECT EQUIPMENT	-60.00 TN	-	(10,500)	-				(10,500)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA		-129.00 TN	-	(45,150)	-				(45,150)
			MIXED STEEL				(63,341)					(63,341)
		18.30.00	COPPER									
			#2 SOLID COPPER / TUBING	BUS BAR	-0.33 TN	-	(2,028)	-				(2,028)
			#2 INSULATED COPPER WIRE		-2.00 TN	-	(4,880)	-				(4,880)
			COPPER				(6,908)					(6,908)
			SCRAP VALUE				(70,249)					(70,249)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING TO RECYCLE FACILITY	CONCRETE DEBRIS IS RECYCLED. NO DISPOSAL FEE	217.00 CY	5,526	-					5,526

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			HAULING			5,526						5,526
			CIVIL WORK			5,526						5,526
			345 OTHER PRODUCTION - ACCESSORY ELECTRIC EQUIPMENT			**5,526**	**(70,249)**		**1,684**	**234,288**	**61,683**	**231,248**

APPENDIX C. EXPLANATION OF VARIANACE FROM THE PREVIOUS COST STUDY

Cost Category, Desert Star	2021 Cost Estimate		2016 Cost Estimate	Delta	% of total cost	Discussion
Labor						
Labor - Direct		$4,069,698				
Labor Supervision	$244,182					The 2016 estimate included all demolition contractor costs in labor. The 2021 cost estimate broke out demolition contractor costs (subcontracts, construction equipment, general conditions - labor).
Show-up time	$81,394					
Construction Management	$439,527					
Field Office Expenses	$96,696					Average hourly labor cost increased by 19%. The average labor cost for the 2021 cost estimate is $69.99/hr. as compared to the 2016 cost estimate of $58.66.
Safety	$86,829					
Temporary Facilities	$66,061					
Mob/Demob	$69,621					The 2021 estimate includes the cost of leveling the pond berms. Per SDGE direction, this was not included in the 2016 estimate.
Small tools & consumables	$43,953					
General Liability Insurance	$43,953					
Constr Equip Mob/Demob	$192,801					
Legal Expenses/Claims	$10,285					
General Conditions (Indirect) - Labor		$1,375,302				
Subcontract		$253,380				
Construction Equipment		$1,928,009				
Labor Subtotal		**$7,626,389**	**$6,486,187**	**17.6%**	**10.2%**	
Material						
Material w/o freight	$1,245,825					The 2021 cost estimate for material is -6.1% less than 2016.
General Conditions -Freight on Material	$62,291					
Material Subtotal		**$1,308,116**	**$1,393,132**	**-6.1%**	**-0.8%**	
Scrap						The 2021 cost estimate for scrap is -19.5% less than 2016. The main reasons are: (a) cost for scrap mixed steel increased by 114%. Cost for mixed steel in 2021 based on a 12-month average is $175 per ton as compared to 2016 based on a 3-month average of $87 per ton (b) cost for copper decreased by -98.6%. Cost for copper in 2021 was broken out into #2 copper (solid) and #2 (insulated wire) as compared to 2016 which was based on #1 copper (solid bright)
Mixed Steel	-$1,957,384		-$950,092			
Copper	-$20,785		-$1,507,072			
Subtotal Scrap Value		**-$1,978,169**	**-$2,457,164**	**-19.5%**	**4.3%**	
Subtotal - Direct & Indirect Demolition		**$6,956,336**	**$5,422,155**	**28.3%**	**13.7%**	
Contractor G&A and Profit						
Contractor G&A	$591,106		$324,309	82.3%		Contractor G&A is 82.3 percent higher. 2021 estimate is 7% of labor, equipment, and materials. 2016 estimate was 5% of labor and materials.
Contractor Profit	$844,438		$630,346	34.0%		Contractor G&A is 34 percent higher. 2021 estimate is 10% of labor, equipment, and materials. 2016 estimate was 8% of labor and materials.
Subcontractor Contractor G&A and Profit		**$1,435,544**	**$954,655**	**50.4%**	**4.3%**	Increase in Contractor G&A and profit based on S&L database of actual demolition cost since 2016
Indirect						
Engineering	$210,000		$200,000 `			Higher cost due to SDGE internal costs in support of demolition as compared to 2016 where no SDGE internal costs were included
Construction Management	$0		$127,536			
Other SDGE Internal Costs	$902,000		$0			
Subtotal Indirect Costs		**$1,112,000**	**$327,536**	**240%**	**7.0%**	
Contingency		$1,722,307	$2,323,735	-25.9%	**-5.4%**	Contingency is less (-25.9%). Contingency in 2021 is 15% and not applied to scrap. Contingency in 2016 was 20% and applied to scrap.
Total		**$11,226,187**	**$9,028,081**	**24.3%**		

SCRAP	$/ton	tons	$/ton	tons	
Carbon Steel	$175	10,845	$87	10,738	Carbon steel scrap quantity is essentially the same
Steel/Copper mix (large transformers)	$350	390			Carbon/copper is for transformer.
# 1 Copper			$3,460	436	Copper in 2016 was based on solid bright (#1 grade) copper
#2 Copper	$6,145	1			Copper broken out into solid bar and insulated copper wire
#2 Insulated Copper Wire	$2,440	6			Lower copper quantity in 2021 due to copper included in steel/copper mix for larger transformers

Labor hours	53,856 hours	56,934 hours	-5.4%	The labor hours for the 2021 cost estimate are -5.4% less than the 2016 cost estimate. The main reason is that the 2021 cost estimate includes subcontracts (w/o labor hours), based on updated S&L standards, and no planting or seeding.

SL-016628.E_SDGE Decom(PV)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Photovoltaic (PV Sites)

Prepared by Sargent & Lundy

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Final	March 30, 2022	N/A

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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Kevin Hopkins Principal Consultant & Project Manager	March 30, 2022 Date

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
AC	alternating current
BESS(s)	battery energy storage system(s)
DC	direct current
FERC	Federal Energy Regulatory Commission
LID	light-induced degradation
O&M	operations and maintenance
Owner	San Diego Gas & Electric Company
PV	photovoltaic
S&L	Sargent & Lundy LLC
SDG&E	San Diego Gas & Electric Company

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual decommissioning cost estimate SDG&E's portfolio of photovoltaic (PV) generation sites. The work scope included updating the 2016 conceptual demolition cost estimate and report as well as the benchmarking analysis.

METHODOLOGY

The S&L methodology for developing the cost estimate consisted of three elements: (i) S&L experience in developing plant demolition costs and the S&L database for numerous other projects; (ii) the use of the unit cost factor methodology; and (iii) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by SDG&E, including the number of PV panels at each site. These drawings and documents were used to steel quantities, electrical equipment quantities, and other related items. S&L performed a site walkdown of a typical roof-installed PV site and a canopy-type PV installation to review the site components and determine any unique site-specific requirements. This site walkdown was performed in 2016; however, recent discussions with SDG&E confirmed that no significant modifications have occurred since that time other than the removal of six sites from the portfolio.

The gathered information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for panel removal, concrete removal, steel removal, cutting costs, etc. were developed from labor and material cost information. S&L estimated the quantities of metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life. Solar panels were assumed to be recycled by a company such as We Recycle Solar at a cost to SDG&E of $20/panel based on a publication by the National Renewable Energy Laboratory and verbal information from We Recycle Solar.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning the SDG&E PV sites is shown in Table ES-1. The cost estimate broken into FERC accounts is shown in Table ES-2. All costs are in 2021 U.S. dollars, and the total in both tables is $8,499,701. Decommissioning costs are expected to increase by the end of service life due to escalation.

Table ES-1 — Cost Estimate Summary for PV Sites

	Customer	Location	Includes Contingency: Subcontract Cost	Labor Cost	Subcontractor Indirect Cost	SDG&E Internal Costs	Scrap Value	G&A and Profit	Total Cost
Roof Top PV Sites									
1	X-nth (formerly TKG)	Roof	$ 82,271	$ 57,890	$ 12,518	$ 15,195	$ (7,452)	$ 19,453	**$ 179,875**
2	Reuben H Fleet (Science Center)	Roof	$ 168,176	$ 149,951	$ 28,149	$ 34,170	$ (19,320)	$ 43,743	**$ 404,868**
3	Hunter Industries	Roof	$ 151,685	$ 133,005	$ 25,204	$ 30,595	$ (17,163)	$ 39,167	**$ 362,494**
4	The Towers at Bressi Ranch	Roof	$ 127,397	$ 104,876	$ 20,611	$ 25,019	$ (13,571)	$ 32,029	**$ 296,360**
5	Del Sur Elementary	Roof	$ 77,717	$ 52,732	$ 11,667	$ 14,163	$ (6,780)	$ 18,131	**$ 167,631**
6	Ladera Ranch 555	Roof	$ 94,018	$ 68,942	$ 14,529	$ 17,637	$ (8,894)	$ 22,578	**$ 208,809**
7	High Tech High Chula Vista	Roof	$ 159,827	$ 140,368	$ 26,580	$ 32,265	$ (18,071)	$ 41,305	**$ 382,274**
8	Hanna Gabriel Wells	Roof	$ 48,116	$ 18,562	$ 6,081	$ 7,382	$ (2,389)	$ 9,451	**$ 87,203**
9	San Diego CC Skills Center	Roof	$ 102,557	$ 79,098	$ 16,168	$ 19,627	$ (10,162)	$ 25,126	**$ 232,414**
10	Alterra Apartments	Roof	$ 104,075	$ 80,420	$ 16,416	$ 19,927	$ (10,373)	$ 25,510	**$ 235,975**
11	Thomas Jefferson School of Law	Roof	$ 79,045	$ 54,055	$ 11,895	$ 14,440	$ (7,004)	$ 18,485	**$ 170,916**
12	Broadway Pier Cruise Ship Terminal	Roof	$ 61,778	$ 34,023	$ 8,633	$ 10,480	$ (4,389)	$ 13,416	**$ 123,941**
13	Wilco	Roof	$ 459,770	$ 466,635	$ 81,549	$ 98,992	$ (60,119)	$ 126,727	**$ 1,173,553**
14	High Tech High North County	Roof	$ 98,003	$ 73,792	$ 15,303	$ 18,576	$ (9,499)	$ 23,781	**$ 219,957**
15	Urban Corps	Roof	$ 54,378	$ 25,778	$ 7,262	$ 8,816	$ (3,314)	$ 11,286	**$ 104,206**
16	Pacific Ridge School	Roof	$ 51,532	$ 22,530	$ 6,731	$ 8,171	$ (2,869)	$ 10,460	**$ 96,555**
17	Sanford Burnham Medical Research	Roof	$ 173,489	$ 155,991	$ 29,141	$ 35,375	$ (20,117)	$ 45,286	**$ 419,164**
18	High Tech High Chula Vista K-8	Roof	$ 160,586	$ 141,412	$ 26,740	$ 32,460	$ (18,168)	$ 41,555	**$ 384,585**
19	CSUSM - Public Safety Building	Roof	$ 66,332	$ 39,328	$ 9,494	$ 11,525	$ (5,089)	$ 14,754	**$ 136,345**
20	SDG&E EIC (roof)	Roof	$ 76,579	$ 51,262	$ 11,437	$ 13,883	$ (6,620)	$ 17,773	**$ 164,314**
21	UCSD - Revelle College	Roof	$ 69,368	$ 43,017	$ 10,086	$ 12,243	$ (5,529)	$ 15,674	**$ 144,859**
22	Soledad	Roof	$ 123,982	$ 101,348	$ 20,009	$ 24,289	$ (13,031)	$ 31,094	**$ 287,692**
23	Pacific Station	Roof	$ 130,813	$ 109,152	$ 21,287	$ 25,841	$ (14,074)	$ 33,080	**$ 306,099**
24	UCSD - Structural & Materials Engr	Roof	$ 143,716	$ 124,173	$ 23,734	$ 28,811	$ (15,987)	$ 36,883	**$ 341,329**
25	UCSD MESOM	Roof	$ 89,654	$ 64,078	$ 13,721	$ 16,656	$ (8,250)	$ 21,323	**$ 197,182**
26	Village Lindo Paseo	Roof	$ 60,640	$ 32,553	$ 8,402	$ 10,200	$ (4,229)	$ 13,057	**$ 120,623**
27	Del Lago Academy	Roof	$ 180,700	$ 164,383	$ 30,510	$ 37,036	$ (21,172)	$ 47,413	**$ 438,870**
Subtotal - Roof									***$ 7,388,093***

	Customer	Location	Includes Contingency: Subcontract Cost	Labor Cost	Subcontractor Indirect Cost	SDG&E Internal Costs	Scrap Value	G&A and Profit	Total Cost
Carport PV Sites									
28	Sony Corporation	Carport - Canopy	$ 21,574	$ 213,014	$ 13,041	$ 15,831	$ (64,508)	$ 23,712	**$ 222,664**
29	County Operations Center Parking Structure A	Carport - Canopy	$ 45,448	$ 470,350	$ 28,494	$ 34,589	$ (143,774)	$ 51,807	**$ 486,913**
30	SDG&E EIC (parking)	Carport, Free-standing, Multi-axis	$ 6,486	$ 72,326	$ 4,416	$ 5,361	$ (21,303)	$ 8,029	**$ 75,314**
31	Sharp Rees Stealy Wellness Center	Carport - Canopy	$ 8,602	$ 83,979	$ 5,209	$ 6,324	$ (24,790)	$ 9,472	**$ 88,796**
32	San Diego Zoo	Carport - Canopy	$ 10,764	$ 104,625	$ 6,459	$ 7,841	$ (31,257)	$ 11,744	**$ 110,175**
33	Fast EV Suncharge/Del Lago Park N Ride	Carport - Canopy	$ 2,162	$ 18,058	$ 1,228	$ 1,490	$ (4,452)	$ 2,232	**$ 20,717**
34	Agua Hedionda	Carport - Canopy	$ 2,116	$ 10,048	$ 822	$ 998	$ (1,787)	$ 1,495	**$ 13,692**
35	Civita Westpark Apartments	Carport	$ 8,648	$ 88,813	$ 5,474	$ 6,645	$ (26,199)	$ 9,954	**$ 93,336**
Subtotal - Carport									***$ 1,111,608***
	TOTAL Rooftop + Carport								**$ 8,499,701**

Table ES-2 — Cost Estimate Summary by FERC Account for PV Sites

	Customer	*Location*	E344.1: Generators - Solar	E345.1: Accessory Electrical Equipment	*TOTAL COST*
Roof Top PV Sites					
1	X-nth (formerly TKG)	Roof	$ 172,680	$ 7,195	$ 179,875
2	Reuben H Fleet (Science Center)	Roof	$ 388,673	$ 16,195	$ 404,868
3	Hunter Industries	Roof	$ 347,994	$ 14,500	$ 362,494
4	The Towers at Bressi Ranch	Roof	$ 284,506	$ 11,854	$ 296,360
5	Del Sur Elementary	Roof	$ 160,925	$ 6,705	$ 167,631
6	Ladera Ranch 555	Roof	$ 200,457	$ 8,352	$ 208,809
7	High Tech High Chula Vista	Roof	$ 366,983	$ 15,291	$ 382,274
8	Hanna Gabriel Wells	Roof	$ 83,715	$ 3,488	$ 87,203
9	San Diego CC Skills Center	Roof	$ 223,118	$ 9,297	$ 232,414
10	Alterra Apartments	Roof	$ 226,536	$ 9,439	$ 235,975
11	Thomas Jefferson School of Law	Roof	$ 164,079	$ 6,837	$ 170,916
12	Broadway Pier Cruise Ship Terminal	Roof	$ 118,983	$ 4,958	$ 123,941
13	Wilco	Roof	$ 1,126,611	$ 46,942	$ 1,173,553
14	High Tech High North County	Roof	$ 211,158	$ 8,798	$ 219,957
15	Urban Corps	Roof	$ 100,037	$ 4,168	$ 104,206
16	Pacific Ridge School	Roof	$ 92,693	$ 3,862	$ 96,555
17	Sanford Burnham Medical Research	Roof	$ 402,398	$ 16,767	$ 419,164
18	High Tech High Chula Vista K-8	Roof	$ 369,202	$ 15,383	$ 384,585
19	CSUSM - Public Safety Building	Roof	$ 130,891	$ 5,454	$ 136,345
20	SDG&E EIC (roof)	Roof	$ 157,741	$ 6,573	$ 164,314
21	UCSD - Revelle College	Roof	$ 139,065	$ 5,794	$ 144,859
22	Soledad	Roof	$ 276,184	$ 11,508	$ 287,692
23	Pacific Station	Roof	$ 293,855	$ 12,244	$ 306,099
24	UCSD - Structural & Materials Engr	Roof	$ 327,676	$ 13,653	$ 341,329
25	UCSD MESOM	Roof	$ 189,295	$ 7,887	$ 197,182
26	Village Lindo Paseo	Roof	$ 115,799	$ 4,825	$ 120,623
27	Del Lago Academy	Roof	$ 421,315	$ 17,555	$ 438,870
Subtotal - Roof			*$ 7,092,569*	*$ 295,524*	*$ 7,388,093*
Carport PV Sites					
28	Sony Corporation	Carport - Canopy	$ 213,757	$ 8,907	$ 222,664
29	County Operations Center Parking Structur	Carport - Canopy	$ 467,437	$ 19,477	$ 486,913
30	SDG&E EIC (parking)	standing, Multi-axis	$ 72,302	$ 3,013	$ 75,314
31	Sharp Rees Stealy Wellness Center	Carport - Canopy	$ 85,244	$ 3,552	$ 88,796
32	San Diego Zoo	Carport - Canopy	$ 105,768	$ 4,407	$ 110,175
33	Fast EV Suncharge/Del Lago Park N Ride	Carport - Canopy	$ 19,889	$ 829	$ 20,717
34	Agua Hedionda	Carport - Canopy	$ 13,144	$ 548	$ 13,692
35	Civita Westpark Apartments	Carport	$ 89,602	$ 3,733	$ 93,336
Subtotal - Carport			*$ 1,067,144*	*$ 44,464*	*$ 1,111,608*
TOTAL Rooftop + Carport			**$ 8,159,713**	**$ 339,988**	$ 8,499,701

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform a conceptual cost estimate for the dismantlement of the SDG&E portfolio of rooftop and carport photovoltaic (PV) generation sites. The work scope included updating the 2016 conceptual demolition cost estimate and report. The estimate for the 4950-kW utility-scale Ramona PV site is summarized under a separate report.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers, over the years Sargent & Lundy Consulting has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineer services, including decommissioning cost estimation.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations experience to support consulting services such as those performed for the PV sites.

1.3. PV ROOFTOP AND CARPORT DESCRIPTIONS

SDG&E's portfolio of PV sites consists of three types of installations: rooftop, canopy, and utility-scale sites. The rooftop and canopy sites are addressed in this report, and a separate S&L report summarizes the Ramona utility-scale site decommissioning estimate. Many of the rooftop and canopy sites are part of the San Diego Sustainable Communities program that engages local partners to be involved with renewable energy projects in the area. Descriptions of the sites are as follows:

- Most rooftop installations are fixed-tilt PV panels located on commercial buildings, school and university buildings, and other structures. The oldest rooftop PV installation was energized in 2004, and they range in size from 16 to 384 kW.
- Canopy-mounted PV sites are primarily freestanding carport canopies located in parking lots. "Solar tree" canopy installations are multi-axial while the rest are fixed-tilt. The oldest canopy site installed was energized in 2009, and the sites range in size from 5 to 359 kW.

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of stochastic and deterministic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of PV panels, steel framing, etc.). Stochastic methods were also used if quantitative information (e.g., quantity of conduits, miscellaneous electrical equipment) was unavailable.

The cost estimate was developed based on the list of PV projects, typical drawings, and data provided by the Owner and found in the S&L database. (Satellite images from Google Maps were used to determine the installation type for some canopy sites.) These drawings and documents were used to estimate the quantity of aluminum framing, the quantity of steel in canopy and in-ground frames, and other components. The number of panels at each site was provided by SDG&E.

The methodology for developing the cost estimate consisted of three elements: (i) S&L experience in developing plant demolition costs and the existing S&L database for numerous other projects; (ii) the use of the unit cost factor methodology; and (iii) quotes from previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates include details for each type of work performed, indirect costs, and contingencies.

The SDG&E portfolio of PV sites provided the number of panels, power rating, and type of installation. S&L visited a representative rooftop installation and solar tree site at the SDG&E Energy Innovation Center in 2016. This information was used with unit cost factors developed by S&L based on industry data alongside S&L experience. Unit cost factors for PV panel removal, roof repair, steel removal for canopy sites, and other tasks were developed from labor and material cost information. S&L estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life. Solar panels were assumed to be recycled by a company such as We Recycle Solar at a cost to SDG&E of $20/panel based on a publication by the National Renewable Energy Laboratory and verbal information from We Recycle Solar.

S&L relied on SDG&E to identify the location of environmental problems that need to be considered in the estimates (none were identified). The S&L scope of work excludes a detailed survey and testing program to identify such problems.

2.2. COST ESTIMATE SUMMARY

2.2.1. PV Energy Sites

The summary of the cost estimate for decommissioning the portfolio of PV energy sites is shown in Table 2-1. The commercial and technical basis for the estimate is included in Section 3, and the detailed estimate is included in Appendix A. The cost estimate breakdown into FERC accounts is shown in Table 2-2. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of service life of the asset due to escalation and other factors.

Table 2-1 — Cost Estimate Summary for PV Sites

			Includes Contingency						
	Customer	*Location*	*Subcontract Cost*	*Labor Cost*	*Subcontractor Indirect Cost*	*SDG&E Internal Costs*	*Scrap Value*	*G&A and Profit*	*Total Cost*
Roof Top PV Sites									
1	X-nth (formerly TKG)	Roof	$ 82,271	$ 57,890	$ 12,518	$ 15,195	$ (7,452)	$ 19,453	**$ 179,875**
2	Reuben H Fleet (Science Center)	Roof	$ 168,176	$ 149,951	$ 28,149	$ 34,170	$ (19,320)	$ 43,743	**$ 404,868**
3	Hunter Industries	Roof	$ 151,685	$ 133,005	$ 25,204	$ 30,595	$ (17,163)	$ 39,167	**$ 362,494**
4	The Towers at Bressi Ranch	Roof	$ 127,397	$ 104,876	$ 20,611	$ 25,019	$ (13,571)	$ 32,029	**$ 296,360**
5	Del Sur Elementary	Roof	$ 77,717	$ 52,732	$ 11,667	$ 14,163	$ (6,780)	$ 18,131	**$ 167,631**
6	Ladera Ranch 555	Roof	$ 94,018	$ 68,942	$ 14,529	$ 17,637	$ (8,894)	$ 22,578	**$ 208,809**
7	High Tech High Chula Vista	Roof	$ 159,827	$ 140,368	$ 26,580	$ 32,265	$ (18,071)	$ 41,305	**$ 382,274**
8	Hanna Gabriel Wells	Roof	$ 48,116	$ 18,562	$ 6,081	$ 7,382	$ (2,389)	$ 9,451	**$ 87,203**
9	San Diego CC Skills Center	Roof	$ 102,557	$ 79,098	$ 16,168	$ 19,627	$ (10,162)	$ 25,126	**$ 232,414**
10	Alterra Apartments	Roof	$ 104,075	$ 80,420	$ 16,416	$ 19,927	$ (10,373)	$ 25,510	**$ 235,975**
11	Thomas Jefferson School of Law	Roof	$ 79,045	$ 54,055	$ 11,895	$ 14,440	$ (7,004)	$ 18,485	**$ 170,916**
12	Broadway Pier Cruise Ship Terminal	Roof	$ 61,778	$ 34,023	$ 8,633	$ 10,480	$ (4,389)	$ 13,416	**$ 123,941**
13	Wilco	Roof	$ 459,770	$ 466,635	$ 81,549	$ 98,992	$ (60,119)	$ 126,727	**$ 1,173,553**
14	High Tech High North County	Roof	$ 98,003	$ 73,792	$ 15,303	$ 18,576	$ (9,499)	$ 23,781	**$ 219,957**
15	Urban Corps	Roof	$ 54,378	$ 25,778	$ 7,262	$ 8,816	$ (3,314)	$ 11,286	**$ 104,206**
16	Pacific Ridge School	Roof	$ 51,532	$ 22,530	$ 6,731	$ 8,171	$ (2,869)	$ 10,460	**$ 96,555**
17	Sanford Burnham Medical Research	Roof	$ 173,489	$ 155,991	$ 29,141	$ 35,375	$ (20,117)	$ 45,286	**$ 419,164**
18	High Tech High Chula Vista K-8	Roof	$ 160,586	$ 141,412	$ 26,740	$ 32,460	$ (18,168)	$ 41,555	**$ 384,585**
19	CSUSM - Public Safety Building	Roof	$ 66,332	$ 39,328	$ 9,494	$ 11,525	$ (5,089)	$ 14,754	**$ 136,345**
20	SDG&E EIC (roof)	Roof	$ 76,579	$ 51,262	$ 11,437	$ 13,883	$ (6,620)	$ 17,773	**$ 164,314**
21	UCSD - Revelle College	Roof	$ 69,368	$ 43,017	$ 10,086	$ 12,243	$ (5,529)	$ 15,674	**$ 144,859**
22	Soledad	Roof	$ 123,982	$ 101,348	$ 20,009	$ 24,289	$ (13,031)	$ 31,094	**$ 287,692**
23	Pacific Station	Roof	$ 130,813	$ 109,152	$ 21,287	$ 25,841	$ (14,074)	$ 33,080	**$ 306,099**
24	UCSD - Structural & Materials Engr	Roof	$ 143,716	$ 124,173	$ 23,734	$ 28,811	$ (15,987)	$ 36,883	**$ 341,329**
25	UCSD MESOM	Roof	$ 89,654	$ 64,078	$ 13,721	$ 16,656	$ (8,250)	$ 21,323	**$ 197,182**
26	Village Lindo Paseo	Roof	$ 60,640	$ 32,553	$ 8,402	$ 10,200	$ (4,229)	$ 13,057	**$ 120,623**
27	Del Lago Academy	Roof	$ 180,700	$ 164,383	$ 30,510	$ 37,036	$ (21,172)	$ 47,413	**$ 438,870**
Subtotal - Roof									***$ 7,388,093***

			Includes Contingency						
	Customer	*Location*	*Subcontract Cost*	*Labor Cost*	*Subcontractor Indirect Cost*	*SDG&E Internal Costs*	*Scrap Value*	*G&A and Profit*	*Total Cost*
Carport PV Sites									
28	Sony Corporation	Carport - Canopy	$ 21,574	$ 213,014	$ 13,041	$ 15,831	$ (64,508)	$ 23,712	**$ 222,664**
29	County Operations Center Parking Structure A	Carport - Canopy	$ 45,448	$ 470,350	$ 28,494	$ 34,589	$ (143,774)	$ 51,807	**$ 486,913**
30	SDG&E EIC (parking)	Carport, Free-standing, Multi-axis	$ 6,486	$ 72,326	$ 4,416	$ 5,361	$ (21,303)	$ 8,029	**$ 75,314**
31	Sharp Rees Stealy Wellness Center	Carport - Canopy	$ 8,602	$ 83,979	$ 5,209	$ 6,324	$ (24,790)	$ 9,472	**$ 88,796**
32	San Diego Zoo	Carport - Canopy	$ 10,764	$ 104,625	$ 6,459	$ 7,841	$ (31,257)	$ 11,744	**$ 110,175**
33	Fast EV Suncharge/Del Lago Park N Ride	Carport - Canopy	$ 2,162	$ 18,058	$ 1,228	$ 1,490	$ (4,452)	$ 2,232	**$ 20,717**
34	Agua Hedionda	Carport - Canopy	$ 2,116	$ 10,048	$ 822	$ 998	$ (1,787)	$ 1,495	**$ 13,692**
35	Civita Westpark Apartments	Carport	$ 8,648	$ 88,813	$ 5,474	$ 6,645	$ (26,199)	$ 9,954	**$ 93,336**
Subtotal - Carport									***$ 1,111,608***
	TOTAL Rooftop + Carport								**$ 8,499,701**

Table 2-2 — Cost Estimate Summary by FERC Account for PV Sites

	Customer	*Location*	E344.1: Generators - Solar	E345.1: Accessory Electrical Equipment	*TOTAL COST*
Roof Top PV Sites					
1	X-nth (formerly TKG)	Roof	$ 172,680	$ 7,195	$ 179,875
2	Reuben H Fleet (Science Center)	Roof	$ 388,673	$ 16,195	$ 404,868
3	Hunter Industries	Roof	$ 347,994	$ 14,500	$ 362,494
4	The Towers at Bressi Ranch	Roof	$ 284,506	$ 11,854	$ 296,360
5	Del Sur Elementary	Roof	$ 160,925	$ 6,705	$ 167,631
6	Ladera Ranch 555	Roof	$ 200,457	$ 8,352	$ 208,809
7	High Tech High Chula Vista	Roof	$ 366,983	$ 15,291	$ 382,274
8	Hanna Gabriel Wells	Roof	$ 83,715	$ 3,488	$ 87,203
9	San Diego CC Skills Center	Roof	$ 223,118	$ 9,297	$ 232,414
10	Alterra Apartments	Roof	$ 226,536	$ 9,439	$ 235,975
11	Thomas Jefferson School of Law	Roof	$ 164,079	$ 6,837	$ 170,916
12	Broadway Pier Cruise Ship Terminal	Roof	$ 118,983	$ 4,958	$ 123,941
13	Wilco	Roof	$ 1,126,611	$ 46,942	$ 1,173,553
14	High Tech High North County	Roof	$ 211,158	$ 8,798	$ 219,957
15	Urban Corps	Roof	$ 100,037	$ 4,168	$ 104,206
16	Pacific Ridge School	Roof	$ 92,693	$ 3,862	$ 96,555
17	Sanford Burnham Medical Research	Roof	$ 402,398	$ 16,767	$ 419,164
18	High Tech High Chula Vista K-8	Roof	$ 369,202	$ 15,383	$ 384,585
19	CSUSM - Public Safety Building	Roof	$ 130,891	$ 5,454	$ 136,345
20	SDG&E EIC (roof)	Roof	$ 157,741	$ 6,573	$ 164,314
21	UCSD - Revelle College	Roof	$ 139,065	$ 5,794	$ 144,859
22	Soledad	Roof	$ 276,184	$ 11,508	$ 287,692
23	Pacific Station	Roof	$ 293,855	$ 12,244	$ 306,099
24	UCSD - Structural & Materials Engr	Roof	$ 327,676	$ 13,653	$ 341,329
25	UCSD MESOM	Roof	$ 189,295	$ 7,887	$ 197,182
26	Village Lindo Paseo	Roof	$ 115,799	$ 4,825	$ 120,623
27	Del Lago Academy	Roof	$ 421,315	$ 17,555	$ 438,870
Subtotal - Roof			*$ 7,092,569*	*$ 295,524*	*$ 7,388,093*
Carport PV Sites					
28	Sony Corporation	Carport - Canopy	$ 213,757	$ 8,907	$ 222,664
29	County Operations Center Parking Structur	Carport - Canopy	$ 467,437	$ 19,477	$ 486,913
30	SDG&E EIC (parking)	standing, Multi-axis	$ 72,302	$ 3,013	$ 75,314
31	Sharp Rees Stealy Wellness Center	Carport - Canopy	$ 85,244	$ 3,552	$ 88,796
32	San Diego Zoo	Carport - Canopy	$ 105,768	$ 4,407	$ 110,175
33	Fast EV Suncharge/Del Lago Park N Ride	Carport - Canopy	$ 19,889	$ 829	$ 20,717
34	Agua Hedionda	Carport - Canopy	$ 13,144	$ 548	$ 13,692
35	Civita Westpark Apartments	Carport	$ 89,602	$ 3,733	$ 93,336
Subtotal - Carport			*$ 1,067,144*	*$ 44,464*	*$ 1,111,608*
TOTAL Rooftop + Carport			**$ 8,159,713**	**$ 339,988**	**$ 8,499,701**

The decommissioning cost of PV sites on a per-panel basis varies with site characteristics and the number of panels. In general, decommissioning costs at sites with fewer panels are higher per panel than sites with many panels due to economy of scale. For example, the SDG&E rooftop site “Pacific Ridge School” has 102 panels and a decommissioning cost of approximately $947 per panel. In contrast, the SDG&E rooftop site “Hunter Industries” has six times the number of panels, 608, and a decommissioning cost of

approximately $596 per panel. The trend between decommissioning costs per panel and the number of panels is asymptotic and levels out for sites with a significant number of panels.

2.2.2. Variance from 2016 Study

The following list summarizes the changes from S&L's 2016 report. Note that material quantities and labor hours in the estimate were unchanged from 2016.

- Six sites were removed from the list, and several of the remaining 35 sites were renamed. The removed sites were all rooftop installations, and they totaled 1259 kW.
- The 2016 estimates assumed that the panels would be disposed with rubbish removed from the site. This has been replaced with a higher cost, where SDG&E pays a company such as We Recycle Solar to recycle the panels for $20/panel. This cost is based on a publication by the National Renewable Energy Laboratory and a conversation with We Recycle Solar.
- The contractor general and administrative costs and profit were increased from 5% and 8%, respectively, to 7% and 10% based on the S&L database.
- SDG&E internal costs were added to the estimate. These were excluded from the 2016 estimate. The internal costs include disconnecting the units from the grid and securing and managing the contractor.
- The current estimates utilize updated labor rates, material costs, and scrap value to current 2021 values.

3. BASIS OF ESTIMATE

The basis for the cost estimates is as follows:

The decommissioning cost estimates in Section 2 and Appendix A are for the dismantlement and removal of 35 different PV sites. In general, the sites can be categorized into two groups: rooftop installations and canopy installations. The rooftop installations are mounted on bolts attached to roofs. The canopy installations are freestanding, and the demolition of the canopy's steel and concrete structure is included with the decommissioning costs.

The cost estimates are based primarily on the data provided by SDG&E and S&L's experience with similar projects.

3.1. PROCEDURE

In general, the methodology to decommission the PV sites is as follows:

- Rooftop Installations
    - De-energize the system.
    - Dismantle and remove all electrical equipment.
    - Remove solar panels.
    - Remove panel racking.
    - Remove mounting points on the rooftop.
    - Remove repair/patch roof holes/damage from removing mounting bolts.
    - Remove the inverter, combiner box, and electrical box aboveground conduits and wiring.
    - Remove transformers.
    - Attain scrap value for metals.
    - Recycle the panels.
    - Dispose of materials.
- Canopy Installations
    - De-energize the system.
    - Dismantle and remove all electrical equipment.
    - Remove the solar panels.
    - Remove the panel racking.
    - Remove the steel canopy structure and cut for scrap as necessary.

- Demolish the steel structures' concrete foundations and remove the concrete down to one foot.
- Cap and abandon the conduit.
- Remove the inverter, combiner box, and electrical box aboveground conduits and wiring.
- Remove the transformers.
- Attain scrap value for metals.
- Recycle the panels.
- Dispose of materials.

3.2. PRICING AND QUANTITIES

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for San Diego, California as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for show-up time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from engineering-supplied information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included in the cost estimate as direct costs as noted for the following:

   - Labor supervision
   - Construction management
   - Field office expenses
   - Safety
   - Temporary facilities
   - Mobilization/demobilization
   - Legal expenses/claims
   - Small tools and consumables
   - General liability insurance

- Construction equipment mobilization/demobilization
- Freight on material
- Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)
- Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

5. Scrap

Scrap metals are a globally traded commodity and are part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions; as such, the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is estimated at $30/ton, resulting in the values shown in Table 3-1:

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
Aluminum	1172
#2 Insulated Copper Wire	2440
Stainless Steel	1217

Note: 1 ton = 2000 lbs.

6. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, engineering required to place the relevant equipment in safe shutdown, and any unique engineering required during demolition.
- SDG&E internal costs are included to cover costs in support of decommissioning the stations such as disconnecting the units from the grid and securing and managing the contractor.

7. Escalation Rates

Escalation rates are not included.

8. Sales and Use Taxes

Sales and use taxes are not included.

9. Contingency

- A 15% contingency is applied for material, labor, and indirect expenses.

[1] www.americanrecycler.com

- There is no contingency on scrap value.

10. Contract Basis for Estimates

The contracting strategy is a multiple lump sum for the estimates.

11. Assumptions

- All electrical equipment and wiring is de-energized by SDG&E.
- Transmission/distribution equipment beyond each PV sites' step-up transformer is excluded from the estimate. This includes overhead transmission wires, switchyards, substations, etc.
- Per SDG&E's direction, all rooftop PV panels are assumed to be fixed to the roof by four bolts. A cost of $165/panel has been allocated for roof repair based on S&L's database of experience with similar repair work.
- No extraordinary environmental costs for demolition will be needed.
- All items above grade and to a depth of one foot will be demolished (canopy foundations). All foundations will be removed. Any other items buried more than one foot deep will remain in place.
- Solar panels are recycled by a company such as We Recycle Solar at a cost to SDG&E of $20/panel based on a publication by the National Renewable Energy Laboratory and verbal information from We Recycle Solar.
- All demolished materials are considered debris, except for non-embedded metals that have scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.

4. REFERENCES

12. Sargent & Lundy Cost Database.
13. RSMeans Cost Data, 2021.
14. Engineering Drawings, Equipment Lists and other information provided by San Diego Gas & Electric.
15. *Scrap Metals MarketWatch* – West Coast (Zone 1), www.americanrecycler.com.
16. Satellite images of sites (Google Maps).
17. *A Circular Economy for Solar Photovoltaic System Materials: Drivers, Barriers, Enablers, and U.S. Policy Considerations* by T. Curtis, H. Buchanan, L Smith, and G. Heath for the DOE National Renewable Energy Laboratory, Technical Report NREL/TP-6A20-74550, April 2021.

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DECOMMISSION PV SITES

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
1	XNT	X-nth (formerly TKG)	5670 Oberlin Dr, San Diego	Roof	PV	6/24/2004	40.70	264

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				9 /MH	$ 140.47	$ 1,264	$ 1,264
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Disconnect wiring at inverter		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		2 EA				21 /MH	$ 127.80	$ 2,684	$ 2,684
			Pull wire from combiners to inverter		2 EA				15 /MH	$ 127.80	$ 1,917	$ 1,917
			Disconnect and remove wiring at PV panels		264 EA				40 /MH	$ 127.80	$ 5,112	$ 5,112
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		264 EA				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Demo conduit from rack to tie point		1 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Demo conduit from rack to transformer		1 EA				7 /MH	$ 127.80	$ 895	$ 895
			Demo conduit from combiners to inverter		1 EA				38 /MH	$ 127.80	$ 4,856	$ 4,856
			Remove Conduits to inverters		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Remove inverters		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Remove PV panel and place in dumpster		264 EA				132 /MH	$ 127.80	$ 16,870	$ 16,870
			Remove points where panel is fixed to roof		264 EA				59 /MH	$ 127.80	$ 7,540	$ 7,540
			Remove lightning projection and other auxiliary equipment		1 EA				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Remove transformer		1 LT				10 /MH	$ 127.80	$ 1,278	$ 1,278
			Demolition			***$ -***	***$ -***	***$ -***			***$ 50,339***	***$ 50,339***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.18 TN		$ (32)		/MH			$ (32)
			Steel	Service rack components	0.07 TN		$ (12)		/MH			$ (12)
			Steel	Conduit and fittings	0.07 TN		$ (12)		/MH			$ (12)
			Steel	Transformers	2.15 TN		$ (376)		/MH			$ (376)
			Steel	Roof ladder, 1@ 350 lb each	0.03 TN		$ (5)		/MH			$ (5)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	1.8 TN		$ (2,110)		/MH			$ (2,110)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.06 TN		$ (146)		/MH			$ (146)
			Copper	Wire	0.4 TN		$ (976)		/MH			$ (976)
			Copper	Transformers	1.02 TN		$ (2,489)		/MH			$ (2,489)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	2112 LB		$ (1,285)		/MH			$ (1,285)
			Conduit and fittings	100 @ 1 lb each	14.77 LB		$ (9)		/MH			$ (9)
			Scrap Value			***$ -***	***$ (7,452)***	***$ -***			***$ -***	***$ (7,452)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1 EA	$ 1,800			/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 2,980***	***$ -***	***$ -***			***$ -***	***$ 2,980***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	264 EA	$ 43,560			/MH		$ -	$ 43,560
			Architectual			***$ 43,560***	***$ -***	***$ -***			***$ -***	***$ 43,560***
Direct Costs												*$ 89,427*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 71,540*	*$ (7,452)*	*$ -*			*$ 50,339*	*$ 114,427*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 8,010
		91.10	Contractor's Profit									$ 11,443
												$ 19,453
Direct Costs + Construction Indirect Costs						*$ 71,540*	*$ (7,452)*	*$ -*			*$ 50,339*	*$ 133,880*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 8,033
		93.2	Construction Management Support									$ 2,678
		93.3	SDG&E Internal Costs									$ 13,388
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 10,731						$ 10,731
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 7,551	$ 7,551
		95.5	Contingency on Indirect									$ 3,615
Total						**$ 82,271**	**$ (7,452)**	**$ -**			**$ 57,890**	**$ 179,875**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
2	RHF	Reuben H Fleet (Science Center)	1875 El Prado, San Diego	Roof	PV	3/30/2007	100.10	684

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				23	/MH	$ 140.47	$ 3,231	$ 3,231
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				24	/MH	$ 127.80	$ 3,067	$ 3,067
			Disconnect wiring at inverter		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at combiner boxes, remove boxes		5	EA				55	/MH	$ 127.80	$ 7,029	$ 7,029
			Pull wire from combiners to inverter		5	EA				40	/MH	$ 127.80	$ 5,112	$ 5,112
			Disconnect and remove wiring at PV panels		684	EA				103	/MH	$ 127.80	$ 13,163	$ 13,163
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		684	EA				28	/MH	$ 127.80	$ 3,578	$ 3,578
			Demo conduit from rack to tie point		1	EA				24	/MH	$ 127.80	$ 3,067	$ 3,067
			Demo conduit from rack to transformer		1	EA				18	/MH	$ 127.80	$ 2,300	$ 2,300
			Demo conduit from combiners to inverter		1	EA				98	/MH	$ 127.80	$ 12,524	$ 12,524
			Remove Conduits to inverters		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Remove inverters		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Remove PV panel and place in dumpster		684	EA				342	/MH	$ 127.80	$ 43,708	$ 43,708
			Remove points where panel is fixed to roof		684	EA				153	/MH	$ 127.80	$ 19,553	$ 19,553
			Remove lightning projection and other auxiliary equipment		1	EA				64	/MH	$ 127.80	$ 8,179	$ 8,179
			Remove transformer		1	LT				25	/MH	$ 127.80	$ 3,195	$ 3,195
			Demolition				***$ -***	***$ -***	***$ -***				***$ 130,392***	***$ 130,392***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.48	TN		$ (84)			/MH			$ (84)
			Steel	Service rack components	0.18	TN		$ (32)			/MH			$ (32)
			Steel	Conduit and fittings	0.19	TN		$ (33)			/MH			$ (33)
			Steel	Transformers	5.57	TN		$ (975)			/MH			$ (975)
			Steel	Roof ladder, 1@ 350 lb each	0.07	TN		$ (12)			/MH			$ (12)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	4.66	TN		$ (5,462)			/MH			$ (5,462)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.15	TN		$ (366)			/MH			$ (366)
			Copper	Wire	1.04	TN		$ (2,538)			/MH			$ (2,538)
			Copper	Transformers	2.65	TN		$ (6,466)			/MH			$ (6,466)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	5472	LB		$ (3,330)			/MH			$ (3,330)
			Conduit and fittings	100 @ 1 lb each	38.26	LB		$ (23)			/MH			$ (23)
			Scrap Value				***$ -***	***$ (19,320)***	***$ -***				***$ -***	***$ (19,320)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4	EA	$ 7,200				/MH			$ 7,200
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 8,380***	***$ -***	***$ -***				***$ -***	***$ 8,380***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	684	EA	$ 112,860				/MH		$ -	$ 112,860
			Architectual				***$ 112,860***	***$ -***	***$ -***				***$ -***	***$ 112,860***
Direct Costs														*$ 232,312*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 146,240*	*$ (19,320)*	*$ -*				*$ 130,392*	*$ 257,312*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 18,012
		91.10	Contractor's Profit											$ 25,731
														$ 43,743
Direct Costs + Construction Indirect Costs							*$ 146,240*	*$ (19,320)*	*$ -*				*$ 130,392*	*$ 301,055*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 18,063
		93.2	Construction Management Support											$ 6,021
		93.3	SDG&E Internal Costs											$ 30,105
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 21,936							$ 21,936.00
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 19,559	$ 19,559
		95.5	Contingency on Indirect											$ 8,128
Total							**$ 168,176**	**$ (19,320)**	**$ -**				**$ 149,951**	**$ 404,868**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
3	HUI	Hunter Industries	1840 La Costa Meadows Rd, San Marcos	Roof	PV	12/4/2007	101.80	608

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				20	/MH	$ 140.47	$ 2,809	$ 2,809
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				22	/MH	$ 127.80	$ 2,812	$ 2,812
			Disconnect wiring at inverter		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Disconnect wiring at combiner boxes, remove boxes		4	EA				49	/MH	$ 127.80	$ 6,262	$ 6,262
			Pull wire from combiners to inverter		4	EA				35	/MH	$ 127.80	$ 4,473	$ 4,473
			Disconnect and remove wiring at PV panels		608	EA				91	/MH	$ 127.80	$ 11,630	$ 11,630
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		608	EA				24	/MH	$ 127.80	$ 3,067	$ 3,067
			Demo conduit from rack to tie point		1	EA				22	/MH	$ 127.80	$ 2,812	$ 2,812
			Demo conduit from rack to transformer		1	EA				16	/MH	$ 127.80	$ 2,045	$ 2,045
			Demo conduit from combiners to inverter		1	EA				87	/MH	$ 127.80	$ 11,119	$ 11,119
			Remove Conduits to inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove inverters		1	EA				8	/MH	$ 127.80	$ 1,022	$ 1,022
			Remove PV panel and place in dumpster		608	EA				304	/MH	$ 127.80	$ 38,851	$ 38,851
			Remove points where panel is fixed to roof		608	EA				136	/MH	$ 127.80	$ 17,381	$ 17,381
			Remove lightning projection and other auxiliary equipment		1	EA				57	/MH	$ 127.80	$ 7,285	$ 7,285
			Remove transformer		1	LT				22	/MH	$ 127.80	$ 2,812	$ 2,812
			Demolition				***$ -***	***$ -***	***$ -***				***$ 115,657***	***$ 115,657***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.43	TN		$ (75)			/MH			$ (75)
			Steel	Service rack components	0.16	TN		$ (28)			/MH			$ (28)
			Steel	Conduit and fittings	0.17	TN		$ (30)			/MH			$ (30)
			Steel	Transformers	4.95	TN		$ (866)			/MH			$ (866)
			Steel	Roof ladder, 1@ 350 lb each	0.06	TN		$ (11)			/MH			$ (11)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	4.14	TN		$ (4,852)			/MH			$ (4,852)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.14	TN		$ (342)			/MH			$ (342)
			Copper	Wire	0.92	TN		$ (2,245)			/MH			$ (2,245)
			Copper	Transformers	2.35	TN		$ (5,734)			/MH			$ (5,734)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	4864	LB		$ (2,960)			/MH			$ (2,960)
			Conduit and fittings	100 @ 1 lb each	34	LB		$ (21)			/MH			$ (21)
			Scrap Value				***$ -***	***$ (17,163)***	***$ -***				***$ -***	***$ (17,163)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3	EA	$ 5,400				/MH			$ 5,400
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 6,580***	***$ -***	***$ -***				***$ -***	***$ 6,580***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	608	EA	$ 100,320				/MH		$ -	$ 100,320
			Architectual				***$ 100,320***	***$ -***	***$ -***				***$ -***	***$ 100,320***
Direct Costs														*$ 205,394*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 131,900*	*$ (17,163)*	*$ -*				*$ 115,657*	*$ 230,394*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 16,128
		91.10	Contractor's Profit											$ 23,039
														$ 39,167
Direct Costs + Construction Indirect Costs							*$ 131,900*	*$ (17,163)*	*$ -*				*$ 115,657*	*$ 269,561*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 16,174
		93.2	Construction Management Support											$ 5,391
		93.3	SDG&E Internal Costs											$ 26,956
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 19,785							$ 19,785
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 17,349	$ 17,349
		95.5	Contingency on Indirect											$ 7,278
Total							**$ 151,685**	**$ (17,163)**	**$ -**				**$ 133,005**	**$ 362,494**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
4	TBR	The Towers at Bressi Ranch	6156 Innovation Way, Carlsbad, CA	Roof	PV	2/28/2008	80.40	480

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				16	/MH	$ 140.47	$ 2,248	$ 2,248
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Disconnect wiring at inverter		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Disconnect wiring at combiner boxes, remove boxes		3	EA				38	/MH	$ 127.80	$ 4,856	$ 4,856
			Pull wire from combiners to inverter		3	EA				28	/MH	$ 127.80	$ 3,578	$ 3,578
			Disconnect and remove wiring at PV panels		480	EA				72	/MH	$ 127.80	$ 9,202	$ 9,202
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		480	EA				19	/MH	$ 127.80	$ 2,428	$ 2,428
			Demo conduit from rack to tie point		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Demo conduit from rack to transformer		1	EA				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Demo conduit from combiners to inverter		1	EA				69	/MH	$ 127.80	$ 8,818	$ 8,818
			Remove Conduits to inverters		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Remove inverters		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Remove PV panel and place in dumpster		480	EA				240	/MH	$ 127.80	$ 30,672	$ 30,672
			Remove points where panel is fixed to roof		480	EA				107	/MH	$ 127.80	$ 13,675	$ 13,675
			Remove lightning projection and other auxiliary equipment		1	EA				45	/MH	$ 127.80	$ 5,751	$ 5,751
			Remove transformer		1	LT				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Demolition				***$ -***	***$ -***	***$ -***				***$ 91,196***	***$ 91,196***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.34	TN		$ (60)			/MH			$ (60)
			Steel	Service rack components	0.13	TN		$ (23)			/MH			$ (23)
			Steel	Conduit and fittings	0.13	TN		$ (23)			/MH			$ (23)
			Steel	Transformers	3.91	TN		$ (684)			/MH			$ (684)
			Steel	Roof ladder, 1@ 350 lb each	0.05	TN		$ (9)			/MH			$ (9)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	3.27	TN		$ (3,832)			/MH			$ (3,832)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.11	TN		$ (268)			/MH			$ (268)
			Copper	Wire	0.73	TN		$ (1,781)			/MH			$ (1,781)
			Copper	Transformers	1.86	TN		$ (4,538)			/MH			$ (4,538)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	3840	LB		$ (2,337)			/MH			$ (2,337)
			Conduit and fittings	100 @ 1 lb each	26.85	LB		$ (16)			/MH			$ (16)
			Scrap Value				***$ -***	***$ (13,571)***	***$ -***				***$ -***	***$ (13,571)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3	EA	$ 5,400				/MH			$ 5,400
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 6,580***	***$ -***	***$ -***				***$ -***	***$ 6,580***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	480	EA	$ 79,200				/MH		$ -	$ 79,200
			Architectual				***$ 79,200***	***$ -***	***$ -***				***$ -***	***$ 79,200***
Direct Costs														*$ 163,405*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 110,780*	*$ (13,571)*	*$ -*				*$ 91,196*	*$ 188,405*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 13,188
		91.10	Contractor's Profit											$ 18,840
														$ 32,029
Direct Costs + Construction Indirect Costs							*$ 110,780*	*$ (13,571)*	*$ -*				*$ 91,196*	*$ 220,434*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 13,226
		93.2	Construction Management Support											$ 4,409
		93.3	SDG&E Internal Costs											$ 22,043
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 16,617							$ 16,617.00
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 13,679.45	$ 13,679
		95.5	Contingency on Indirect											$ 5,952
Total							**$ 127,397**	**$ (13,571)**	**$ -**				**$ 104,876**	**$ 296,360**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
5	DSE	Del Sur Elementary	15665 Paseo Del Sur, San Diego	Roof	PV	9/5/2008	42.40	240

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				8 /MH	$ 140.47	$ 1,124	$ 1,124
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Disconnect wiring at inverter		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		2 EA				19 /MH	$ 127.80	$ 2,428	$ 2,428
			Pull wire from combiners to inverter		2 EA				14 /MH	$ 127.80	$ 1,789	$ 1,789
			Disconnect and remove wiring at PV panels		240 EA				36 /MH	$ 127.80	$ 4,601	$ 4,601
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		240 EA				10 /MH	$ 127.80	$ 1,278	$ 1,278
			Demo conduit from rack to tie point		1 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Demo conduit from rack to transformer		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Demo conduit from combiners to inverter		1 EA				34 /MH	$ 127.80	$ 4,345	$ 4,345
			Remove Conduits to inverters		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Remove inverters		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Remove PV panel and place in dumpster		240 EA				120 /MH	$ 127.80	$ 15,336	$ 15,336
			Remove points where panel is fixed to roof		240 EA				54 /MH	$ 127.80	$ 6,901	$ 6,901
			Remove lightning projection and other auxiliary equipment		1 EA				23 /MH	$ 127.80	$ 2,939	$ 2,939
			Remove transformer		1 LT				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Demolition			***$ -***	***$ -***	***$ -***			***$ 45,854***	***$ 45,854***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.17 TN		$ (30)		/MH			$ (30)
			Steel	Service rack components	0.06 TN		$ (11)		/MH			$ (11)
			Steel	Conduit and fittings	0.07 TN		$ (12)		/MH			$ (12)
			Steel	Transformers	1.96 TN		$ (343)		/MH			$ (343)
			Steel	Roof ladder, 1@ 350 lb each	0.02 TN		$ (4)		/MH			$ (4)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	1.63 TN		$ (1,910)		/MH			$ (1,910)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.05 TN		$ (122)		/MH			$ (122)
			Copper	Wire	0.37 TN		$ (903)		/MH			$ (903)
			Copper	Transformers	0.93 TN		$ (2,269)		/MH			$ (2,269)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	1920 LB		$ (1,168)		/MH			$ (1,168)
			Conduit and fittings	100 @ 1 lb each	13.42 LB		$ (8)		/MH			$ (8)
			Scrap Value			***$ -***	***$ (6,780)***	***$ -***			***$ -***	***$ (6,780)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1 EA	$ 1,800			/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 2,980***	***$ -***	***$ -***			***$ -***	***$ 2,980***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	240 EA	$ 39,600			/MH		$ -	$ 39,600
			Architectual			***$ 39,600***	***$ -***	***$ -***			***$ -***	***$ 39,600***
Direct Costs												*$ 81,654*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 67,580*	*$ (6,780)*	*$ -*			*$ 45,854*	*$ 106,654*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 7,466
		91.10	Contractor's Profit									$ 10,665
												$ 18,131
Direct Costs + Construction Indirect Costs						*$ 67,580*	*$ (6,780)*	*$ -*			*$ 45,854*	*$ 124,785*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 7,487
		93.2	Construction Management Support									$ 2,496
		93.3	SDG&E Internal Costs									$ 12,479
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 10,137						$ 10,137.00
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 6,878	$ 6,878
		95.5	Contingency on Indirect									$ 3,369
Total						**$ 77,717**	**$ (6,780)**	**$ -**			**$ 52,732**	**$ 167,631**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
6	LRF	Ladera Ranch 555	555 Corporate Drive, Ladera Ranch	Roof	PV	9/17/2008	49.20	315

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				11 /MH	$ 140.47	$ 1,545	$ 1,545
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Disconnect wiring at inverter		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at combiner boxes, remove boxes		2 EA				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Pull wire from combiners to inverter		2 EA				18 /MH	$ 127.80	$ 2,300	$ 2,300
			Disconnect and remove wiring at PV panels		315 EA				47 /MH	$ 127.80	$ 6,007	$ 6,007
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		315 EA				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Demo conduit from rack to tie point		1 EA				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Demo conduit from rack to transformer		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Demo conduit from combiners to inverter		1 EA				45 /MH	$ 127.80	$ 5,751	$ 5,751
			Remove Conduits to inverters		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Remove inverters		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Remove PV panel and place in dumpster		315 EA				158 /MH	$ 127.80	$ 20,192	$ 20,192
			Remove points where panel is fixed to roof		315 EA				70 /MH	$ 127.80	$ 8,946	$ 8,946
			Remove lightning projection and other auxiliary equipment		1 EA				30 /MH	$ 127.80	$ 3,834	$ 3,834
			Remove transformer		1 LT				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Demolition			***$ -***	***$ -***	***$ -***			***$ 59,950***	***$ 59,950***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.22 TN		$ (39)		/MH			$ (39)
			Steel	Service rack components	0.08 TN		$ (14)		/MH			$ (14)
			Steel	Conduit and fittings	0.09 TN		$ (16)		/MH			$ (16)
			Steel	Transformers	2.57 TN		$ (450)		/MH			$ (450)
			Steel	Roof ladder, 1@ 350 lb each	0.03 TN		$ (5)		/MH			$ (5)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	2.14 TN		$ (2,508)		/MH			$ (2,508)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.07 TN		$ (171)		/MH			$ (171)
			Copper	Wire	0.48 TN		$ (1,171)		/MH			$ (1,171)
			Copper	Transformers	1.22 TN		$ (2,977)		/MH			$ (2,977)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	2520 LB		$ (1,533)		/MH			$ (1,533)
			Conduit and fittings	100 @ 1 lb each	17.62 LB		$ (11)		/MH			$ (11)
			Scrap Value			***$ -***	***$ (8,894)***	***$ -***			***$ -***	***$ (8,894)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	2 EA	$ 3,600			/MH			$ 3,600
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 4,780***	***$ -***	***$ -***			***$ -***	***$ 4,780***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	315 EA	$ 51,975			/MH		$ -	$ 51,975
			Architectual			***$ 51,975***	***$ -***	***$ -***			***$ -***	***$ 51,975***
Direct Costs												*$ 107,810*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 81,755*	*$ (8,894)*	*$ -*			*$ 59,950*	*$ 132,810*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 9,297
		91.10	Contractor's Profit									$ 13,281
												$ 22,578
Direct Costs + Construction Indirect Costs						*$ 81,755*	*$ (8,894)*	*$ -*			*$ 59,950*	*$ 155,388*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 9,323.30
		93.2	Construction Management Support									$ 3,107.77
		93.3	SDG&E Internal Costs									$ 15,539
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 12,263						$ 12,263.25
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 8,992	$ 8,992
		95.5	Contingency on Indirect									$ 4,195
Total						**$ 94,018**	**$ (8,894)**	**$ -**			**$ 68,942**	**$ 208,809**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
7	HTC	High Tech High Chula Vista	1945 Discovery Falls Drive, Chula Vista	Roof	PV	2/9/2009	101	640

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				21 /MH	$ 140.47	$ 2,950	$ 2,950
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				23 /MH	$ 127.80	$ 2,939	$ 2,939
			Disconnect wiring at inverter		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at combiner boxes, remove boxes		5 EA				51 /MH	$ 127.80	$ 6,518	$ 6,518
			Pull wire from combiners to inverter		5 EA				37 /MH	$ 127.80	$ 4,729	$ 4,729
			Disconnect and remove wiring at PV panels		640 EA				96 /MH	$ 127.80	$ 12,269	$ 12,269
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		640 EA				26 /MH	$ 127.80	$ 3,323	$ 3,323
			Demo conduit from rack to tie point		1 EA				23 /MH	$ 127.80	$ 2,939	$ 2,939
			Demo conduit from rack to transformer		1 EA				17 /MH	$ 127.80	$ 2,173	$ 2,173
			Demo conduit from combiners to inverter		1 EA				92 /MH	$ 127.80	$ 11,758	$ 11,758
			Remove Conduits to inverters		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Remove inverters		1 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Remove PV panel and place in dumpster		640 EA				320 /MH	$ 127.80	$ 40,896	$ 40,896
			Remove points where panel is fixed to roof		640 EA				143 /MH	$ 127.80	$ 18,275	$ 18,275
			Remove lightning projection and other auxiliary equipment		1 EA				60 /MH	$ 127.80	$ 7,668	$ 7,668
			Remove transformer		1 LT				23 /MH	$ 127.80	$ 2,939	$ 2,939
			Demolition			***$ -***	***$ -***	***$ -***			***$ 122,059***	***$ 122,059***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.45 TN		$ (79)		/MH			$ (79)
			Steel	Service rack components	0.17 TN		$ (30)		/MH			$ (30)
			Steel	Conduit and fittings	0.18 TN		$ (32)		/MH			$ (32)
			Steel	Transformers	5.22 TN		$ (914)		/MH			$ (914)
			Steel	Roof ladder, 1@ 350 lb each	0.06 TN		$ (11)		/MH			$ (11)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	4.36 TN		$ (5,110)		/MH			$ (5,110)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.14 TN		$ (342)		/MH			$ (342)
			Copper	Wire	0.97 TN		$ (2,367)		/MH			$ (2,367)
			Copper	Transformers	2.48 TN		$ (6,051)		/MH			$ (6,051)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	5120 LB		$ (3,116)		/MH			$ (3,116)
			Conduit and fittings	100 @ 1 lb each	35.79 LB		$ (22)		/MH			$ (22)
			Scrap Value			***$ -***	***$ (18,071)***	***$ -***			***$ -***	***$ (18,071)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4 EA	$ 7,200			/MH			$ 7,200
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 8,380***	***$ -***	***$ -***			***$ -***	***$ 8,380***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	640 EA	$ 105,600			/MH		$ -	$ 105,600
			Architectual			***$ 105,600***	***$ -***	***$ -***			***$ -***	***$ 105,600***
Direct Costs												*$ 217,969*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 138,980*	*$ (18,071)*	*$ -*			*$ 122,059*	*$ 242,969*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 17,008
		91.10	Contractor's Profit									$ 24,297
												$ 41,305
Direct Costs + Construction Indirect Costs						*$ 138,980*	*$ (18,071)*	*$ -*			*$ 122,059*	*$ 284,273*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 17,056.40
		93.2	Construction Management Support									$ 5,685.47
		93.3	SDG&E Internal Costs									$ 28,427
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 20,847.00						$ 20,847.00
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 18,308.92	$ 18,309
		95.5	Contingency on Indirect									$ 7,675
Total						**$ 159,827**	**$ (18,071)**	**$ -**			**$ 140,368**	**$ 382,274**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
8	HGW	Hanna Gabriel Wells	1955 Bacon St. San Diego	Roof	PV	3/12/2009	16.30	84

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				3 /MH	$ 140.47	$ 421	$ 421
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at inverter		1 EA				1 /MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		1 EA				7 /MH	$ 127.80	$ 895	$ 895
			Pull wire from combiners to inverter		1 EA				5 /MH	$ 127.80	$ 639	$ 639
			Disconnect and remove wiring at PV panels		84 EA				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		84 EA				3 /MH	$ 127.80	$ 383	$ 383
			Demo conduit from rack to tie point		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Demo conduit from rack to transformer		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Demo conduit from combiners to inverter		1 EA				12 /MH	$ 127.80	$ 1,534	$ 1,534
			Remove Conduits to inverters		1 EA				1 /MH	$ 127.80	$ 128	$ 128
			Remove inverters		1 EA				1 /MH	$ 127.80	$ 128	$ 128
			Remove PV panel and place in dumpster		84 EA				42 /MH	$ 127.80	$ 5,368	$ 5,368
			Remove points where panel is fixed to roof		84 EA				19 /MH	$ 127.80	$ 2,428	$ 2,428
			Remove lightning projection and other auxiliary equipment		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Remove transformer		1 LT				3 /MH	$ 127.80	$ 383	$ 383
			Demolition			***$ -***	***$ -***	***$ -***			***$ 16,141***	***$ 16,141***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.06 TN		$ (11)		/MH			$ (11)
			Steel	Service rack components	0.02 TN		$ (4)		/MH			$ (4)
			Steel	Conduit and fittings	0.02 TN		$ (4)		/MH			$ (4)
			Steel	Transformers	0.68 TN		$ (119)		/MH			$ (119)
			Steel	Roof ladder, 1@ 350 lb each	0.01 TN		$ (2)		/MH			$ (2)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	0.57 TN		$ (668)		/MH			$ (668)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.02 TN		$ (49)		/MH			$ (49)
			Copper	Wire	0.13 TN		$ (317)		/MH			$ (317)
			Copper	Transformers	0.33 TN		$ (805)		/MH			$ (805)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	672 LB		$ (409)		/MH			$ (409)
			Conduit and fittings	100 @ 1 lb each	4.7 LB		$ (3)		/MH			$ (3)
			Scrap Value			***$ -***	***$ (2,389)***	***$ -***			***$ -***	***$ (2,389)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1 EA	$ 1,800			/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 2,980***	***$ -***	***$ -***			***$ -***	***$ 2,980***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	84 EA	$ 13,860			/MH		$ -	$ 13,860
			Architectual			***$ 13,860***	***$ -***	***$ -***			***$ -***	***$ 13,860***
Direct Costs												$ 30,592
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 41,840*	*$ (2,389)*	*$ -*			*$ 16,141*	*$ 55,592*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 3,891
		91.10	Contractor's Profit									$ 5,559
												$ 9,451
Direct Costs + Construction Indirect Costs						*$ 41,840*	*$ (2,389)*	*$ -*			*$ 16,141*	*$ 65,042*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 3,903
		93.2	Construction Management Support									$ 1,301
		93.3	SDG&E Internal Costs									$ 6,504
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 6,276.00						$ 6,276
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 2,421.12	$ 2,421
		95.5	Contingency on Indirect									$ 1,756
Total						**$ 48,116**	**$ (2,389)**	**$ -**			**$ 18,562**	**$ 87,203**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
9	SDC	San Diego CC Skills Center	4343 Ocean View Blvd B, San Diego	Roof	PV	7/8/2009	56.90	360

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				12 /MH	$ 140.47	$ 1,686	$ 1,686
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Disconnect wiring at inverter		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at combiner boxes, remove boxes		3 EA				29 /MH	$ 127.80	$ 3,706	$ 3,706
			Pull wire from combiners to inverter		3 EA				21 /MH	$ 127.80	$ 2,684	$ 2,684
			Disconnect and remove wiring at PV panels		360 EA				54 /MH	$ 127.80	$ 6,901	$ 6,901
			Disconnect and remove grounding at PV panels and racks,									
			Remove ground rods		360 EA				14 /MH	$ 127.80	$ 1,789	$ 1,789
			Demo conduit from rack to tie point		1 EA				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Demo conduit from rack to transformer		1 EA				10 /MH	$ 127.80	$ 1,278	$ 1,278
			Demo conduit from combiners to inverter		1 EA				52 /MH	$ 127.80	$ 6,646	$ 6,646
			Remove Conduits to inverters		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Remove inverters		1 EA				5 /MH	$ 127.80	$ 639	$ 639
			Remove PV panel and place in dumpster		360 EA				180 /MH	$ 127.80	$ 23,004	$ 23,004
			Remove points where panel is fixed to roof		360 EA				81 /MH	$ 127.80	$ 10,352	$ 10,352
			Remove lightning projection and other auxiliary equipment		1 EA				34 /MH	$ 127.80	$ 4,345	$ 4,345
			Remove transformer		1 LT				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Demolition			***$ -***	***$ -***	***$ -***			***$ 68,781***	***$ 68,781***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.25 TN		$ (44)		/MH			$ (44)
			Steel	Service rack components	0.09 TN		$ (16)		/MH			$ (16)
			Steel	Conduit and fittings	0.1 TN		$ (18)		/MH			$ (18)
			Steel	Transformers	2.93 TN		$ (513)		/MH			$ (513)
			Steel	Roof ladder, 1@ 350 lb each	0.04 TN		$ (7)		/MH			$ (7)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	2.45 TN		$ (2,871)		/MH			$ (2,871)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.08 TN		$ (195)		/MH			$ (195)
			Copper	Wire	0.55 TN		$ (1,342)		/MH			$ (1,342)
			Copper	Transformers	1.39 TN		$ (3,392)		/MH			$ (3,392)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	2880 LB		$ (1,752)		/MH			$ (1,752)
			Conduit and fittings	100 @ 1 lb each	20.13 LB		$ (12)		/MH			$ (12)
			Scrap Value			***$ -***	***$ (10,162)***	***$ -***			***$ -***	***$ (10,162)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	2 EA	$ 3,600			/MH			$ 3,600
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 4,780***	***$ -***	***$ -***			***$ -***	***$ 4,780***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	360 EA	$ 59,400			/MH		$ -	$ 59,400
			Architectual			***$ 59,400***	***$ -***	***$ -***			***$ -***	***$ 59,400***
Direct Costs												*$ 122,799*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 89,180*	*$ (10,162)*	*$ -*			*$ 68,781*	*$ 147,799*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 10,346
		91.10	Contractor's Profit									$ 14,780
												$ 25,126
Direct Costs + Construction Indirect Costs						*$ 89,180*	*$ (10,162)*	*$ -*			*$ 68,781*	*$ 172,925*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 10,375
		93.2	Construction Management Support									$ 3,458
		93.3	SDG&E Internal Costs									$ 17,292
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 13,377						$ 13,377.00
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 10,317	$ 10,317
		95.5	Contingency on Indirect									$ 4,669
Total						**$ 102,557**	**$ (10,162)**	**$ -**			**$ 79,098**	**$ 232,414**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
10	GTA	Alterra Apartments	8717 Fletcher Parkway, La Mesa	Roof	PV	4/27/2010	64.70	368

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				12	/MH	$ 140.47	$ 1,686	$ 1,686
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Disconnect wiring at inverter		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at combiner boxes, remove boxes		3	EA				29	/MH	$ 127.80	$ 3,706	$ 3,706
			Pull wire from combiners to inverter		3	EA				21	/MH	$ 127.80	$ 2,684	$ 2,684
			Disconnect and remove wiring at PV panels		368	EA				55	/MH	$ 127.80	$ 7,029	$ 7,029
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		368	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Demo conduit from rack to tie point		1	EA				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Demo conduit from rack to transformer		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Demo conduit from combiners to inverter		1	EA				53	/MH	$ 127.80	$ 6,773	$ 6,773
			Remove Conduits to inverters		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Remove inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove PV panel and place in dumpster		368	EA				184	/MH	$ 127.80	$ 23,515	$ 23,515
			Remove points where panel is fixed to roof		368	EA				82	/MH	$ 127.80	$ 10,480	$ 10,480
			Remove lightning projection and other auxiliary equipment		1	EA				35	/MH	$ 127.80	$ 4,473	$ 4,473
			Remove transformer		1	LT				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Demolition				***$ -***	***$ -***	***$ -***				***$ 69,931***	***$ 69,931***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.26	TN		$ (46)			/MH			$ (46)
			Steel	Service rack components	0.1	TN		$ (18)			/MH			$ (18)
			Steel	Conduit and fittings	0.1	TN		$ (18)			/MH			$ (18)
			Steel	Transformers	3	TN		$ (525)			/MH			$ (525)
			Steel	Roof ladder, 1@ 350 lb each	0.04	TN		$ (7)			/MH			$ (7)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	2.5	TN		$ (2,930)			/MH			$ (2,930)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.08	TN		$ (195)			/MH			$ (195)
			Copper	Wire	0.56	TN		$ (1,366)			/MH			$ (1,366)
			Copper	Transformers	1.42	TN		$ (3,465)			/MH			$ (3,465)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	2944	LB		$ (1,791)			/MH			$ (1,791)
			Conduit and fittings	100 @ 1 lb each	20.58	LB		$ (13)			/MH			$ (13)
			Scrap Value				***$ -***	***$ (10,373)***	***$ -***				***$ -***	***$ (10,373)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	2	EA	$ 3,600				/MH			$ 3,600
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 4,780***	***$ -***	***$ -***				***$ -***	***$ 4,780***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	368	EA	$ 60,720				/MH		$ -	$ 60,720
			Architectual				***$ 60,720***	***$ -***	***$ -***				***$ -***	***$ 60,720***
Direct Costs														*$ 125,058*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 90,500*	*$ (10,373)*	*$ -*				*$ 69,931*	*$ 150,058*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 10,504
		91.10	Contractor's Profit											$ 15,006
														$ 25,510
Direct Costs + Construction Indirect Costs							*$ 90,500*	*$ (10,373)*	*$ -*				*$ 69,931*	*$ 175,568*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 10,534
		93.2	Construction Management Support											$ 3,511
		93.3	SDG&E Internal Costs											$ 17,557
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 13,575							$ 13,575
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 10,490	$ 10,490
		95.5	Contingency on Indirect											$ 4,740
Total							**$ 104,075**	**$ (10,373)**	**$ -**				**$ 80,420**	**$ 235,975**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
11	TJL	Thomas Jefferson School of Law	1155 Island Ave., San Diego	Roof	PV	1/13/2011	49.90	247

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				8	/MH	$ 140.47	$ 1,124	$ 1,124
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Disconnect wiring at inverter		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		2	EA				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Pull wire from combiners to inverter		2	EA				14	/MH	$ 127.80	$ 1,789	$ 1,789
			Disconnect and remove wiring at PV panels		247	EA				37	/MH	$ 127.80	$ 4,729	$ 4,729
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		247	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Demo conduit from rack to tie point		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Demo conduit from rack to transformer		1	EA				7	/MH	$ 127.80	$ 895	$ 895
			Demo conduit from combiners to inverter		1	EA				35	/MH	$ 127.80	$ 4,473	$ 4,473
			Remove Conduits to inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove inverters		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Remove PV panel and place in dumpster		247	EA				124	/MH	$ 127.80	$ 15,847	$ 15,847
			Remove points where panel is fixed to roof		247	EA				55	/MH	$ 127.80	$ 7,029	$ 7,029
			Remove lightning projection and other auxiliary equipment		1	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Remove transformer		1	LT				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Demolition				***$ -***	***$ -***	***$ -***				***$ 47,004***	***$ 47,004***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.17	TN		$ (30)			/MH			$ (30)
			Steel	Service rack components	0.06	TN		$ (11)			/MH			$ (11)
			Steel	Conduit and fittings	0.07	TN		$ (12)			/MH			$ (12)
			Steel	Transformers	2.01	TN		$ (352)			/MH			$ (352)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.68	TN		$ (1,969)			/MH			$ (1,969)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.06	TN		$ (146)			/MH			$ (146)
			Copper	Wire	0.38	TN		$ (927)			/MH			$ (927)
			Copper	Transformers	0.96	TN		$ (2,342)			/MH			$ (2,342)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	1976	LB		$ (1,202)			/MH			$ (1,202)
			Conduit and fittings	100 @ 1 lb each	13.81	LB		$ (8)			/MH			$ (8)
			Scrap Value				***$ -***	***$ (7,004)***	***$ -***				***$ -***	***$ (7,004)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	247	EA	$ 40,755				/MH		$ -	$ 40,755
			Architectual				***$ 40,755***	***$ -***	***$ -***				***$ -***	***$ 40,755***
Direct Costs														*$ 83,735*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 68,735*	*$ (7,004)*	*$ -*				*$ 47,004*	*$ 108,735*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 7,611
		91.10	Contractor's Profit											$ 10,874
														$ 18,485
Direct Costs + Construction Indirect Costs							*$ 68,735*	*$ (7,004)*	*$ -*				*$ 47,004*	*$ 127,220*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 7,633
		93.2	Construction Management Support											$ 2,544
		93.3	SDG&E Internal Costs											$ 12,722
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 10,310							$ 10,310
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 7,051	$ 7,051
		95.5	Contingency on Indirect											$ 3,435
Total							**$ 79,045**	**$ (7,004)**	**$ -**				**$ 54,055**	**$ 170,916**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
12	PSD	Broadway Pier Cruise Ship Terminal	1000 N Harbor Dr., San Diego	Roof	PV	12/16/2010	30	156

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				5	/MH	$ 140.47	$ 702	$ 702
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at inverter		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		1	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Pull wire from combiners to inverter		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Disconnect and remove wiring at PV panels		156	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		156	EA				6	/MH	$ 127.80	$ 767	$ 767
			Demo conduit from rack to tie point		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Demo conduit from rack to transformer		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Demo conduit from combiners to inverter		1	EA				22	/MH	$ 127.80	$ 2,812	$ 2,812
			Remove Conduits to inverters		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Remove inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove PV panel and place in dumpster		156	EA				78	/MH	$ 127.80	$ 9,968	$ 9,968
			Remove points where panel is fixed to roof		156	EA				35	/MH	$ 127.80	$ 4,473	$ 4,473
			Remove lightning projection and other auxiliary equipment		1	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Remove transformer		1	LT				6	/MH	$ 127.80	$ 767	$ 767
			Demolition				***$ -***	***$ -***	***$ -***				***$ 29,585***	***$ 29,585***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.11	TN		$ (19)			/MH			$ (19)
			Steel	Service rack components	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Conduit and fittings	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Transformers	1.27	TN		$ (222)			/MH			$ (222)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.06	TN		$ (1,242)			/MH			$ (1,242)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.03	TN		$ (73)			/MH			$ (73)
			Copper	Wire	0.24	TN		$ (586)			/MH			$ (586)
			Copper	Transformers	0.6	TN		$ (1,464)			/MH			$ (1,464)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	1248	LB		$ (759)			/MH			$ (759)
			Conduit and fittings	100 @ 1 lb each	8.72	LB		$ (5)			/MH			$ (5)
			Scrap Value				***$ -***	***$ (4,389)***	***$ -***				***$ -***	***$ (4,389)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	156	EA	$ 25,740				/MH		$ -	$ 25,740
			Architectual				***$ 25,740***	***$ -***	***$ -***				***$ -***	***$ 25,740***
Direct Costs														*$ 53,916*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 53,720*	*$ (4,389)*	*$ -*				*$ 29,585*	*$ 78,916*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 5,524
		91.10	Contractor's Profit											$ 7,892
														$ 13,416
Direct Costs + Construction Indirect Costs							*$ 53,720*	*$ (4,389)*	*$ -*				*$ 29,585*	*$ 92,332*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 5,540
		93.2	Construction Management Support											$ 1,847
		93.3	SDG&E Internal Costs											$ 9,233
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 8,058.00							$ 8,058
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 4,438	$ 4,438
		95.5	Contingency on Indirect											$ 2,493
Total							**$ 61,778**	**$ (4,389)**	**$ -**				**$ 34,023**	**$ 123,941**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
13	WCO	Wilco	2633 Progress St, Vista	Roof	PV	5/27/2010	384.30	2128

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				71	/MH	$ 140.47	$ 9,973	$ 9,973
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				76	/MH	$ 127.80	$ 9,713	$ 9,713
			Disconnect wiring at inverter		1	EA				19	/MH	$ 127.80	$ 2,428	$ 2,428
			Disconnect wiring at combiner boxes, remove boxes		15	EA				170	/MH	$ 127.80	$ 21,726	$ 21,726
			Pull wire from combiners to inverter		15	EA				124	/MH	$ 127.80	$ 15,847	$ 15,847
			Disconnect and remove wiring at PV panels		2128	EA				319	/MH	$ 127.80	$ 40,768	$ 40,768
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		2128	EA				86	/MH	$ 127.80	$ 10,991	$ 10,991
			Demo conduit from rack to tie point		1	EA				76	/MH	$ 127.80	$ 9,713	$ 9,713
			Demo conduit from rack to transformer		1	EA				57	/MH	$ 127.80	$ 7,285	$ 7,285
			Demo conduit from combiners to inverter		1	EA				305	/MH	$ 127.80	$ 38,979	$ 38,979
			Remove Conduits to inverters		1	EA				19	/MH	$ 127.80	$ 2,428	$ 2,428
			Remove inverters		1	EA				29	/MH	$ 127.80	$ 3,706	$ 3,706
			Remove PV panel and place in dumpster		2128	EA				1064	/MH	$ 127.80	$ 135,979	$ 135,979
			Remove points where panel is fixed to roof		2128	EA				476	/MH	$ 127.80	$ 60,833	$ 60,833
			Remove lightning projection and other auxiliary equipment		1	EA				200	/MH	$ 127.80	$ 25,560	$ 25,560
			Remove transformer		1	LT				77	/MH	$ 127.80	$ 9,841	$ 9,841
			Demolition				***$ -***	***$ -***	***$ -***				***$ 405,770***	***$ 405,770***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	1.49	TN		$ (261)			/MH			$ (261)
			Steel	Service rack components	0.56	TN		$ (98)			/MH			$ (98)
			Steel	Conduit and fittings	0.6	TN		$ (105)			/MH			$ (105)
			Steel	Transformers	17.34	TN		$ (3,035)			/MH			$ (3,035)
			Steel	Roof ladder, 1@ 350 lb each	0.21	TN		$ (37)			/MH			$ (37)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	14.48	TN		$ (16,971)			/MH			$ (16,971)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.48	TN		$ (1,171)			/MH			$ (1,171)
			Copper	Wire	3.24	TN		$ (7,906)			/MH			$ (7,906)
			Copper	Transformers	8.24	TN		$ (20,106)			/MH			$ (20,106)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	17024	LB		$ (10,359)			/MH			$ (10,359)
			Conduit and fittings	100 @ 1 lb each	119.02	LB		$ (72)			/MH			$ (72)
			Scrap Value				***$ -***	***$ (60,119)***	***$ -***				***$ -***	***$ (60,119)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	12	EA	$ 21,600				/MH			$ 21,600
			Dumpster, 40 CY Capacity	Fix point rods	2	EA	$ 1,800				/MH			$ 1,800
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 23,680***	***$ -***	***$ -***				***$ -***	***$ 23,680***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	2128	EA	$ 351,120				/MH		$ -	$ 351,120
			Architectual				***$ 351,120***	***$ -***	***$ -***				***$ -***	***$ 351,120***
Direct Costs														*$ 720,450*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 399,800*	*$ (60,119)*	*$ -*				*$ 405,770*	*$ 745,450*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 52,182
		91.10	Contractor's Profit											$ 74,545
														$ 126,727
Direct Costs + Construction Indirect Costs							*$ 399,800*	*$ (60,119)*	*$ -*				*$ 405,770*	*$ 872,177*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 52,331
		93.2	Construction Management Support											$ 17,444
		93.3	SDG&E Internal Costs											$ 87,218
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 59,970							$ 59,970
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 60,865	$ 60,865
		95.5	Contingency on Indirect											$ 23,549
Total							**$ 459,770**	**$ (60,119)**	**$ -**				**$ 466,635**	**$ 1,173,553**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
14	HTN	High Tech High North County	1420 West San Marcos Blvd., San Marcos	Roof	PV	3/11/2011	70.20	336

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				11	/MH	$ 140.47	$ 1,545	$ 1,545
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Disconnect wiring at inverter		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at combiner boxes, remove boxes		2	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Pull wire from combiners to inverter		2	EA				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Disconnect and remove wiring at PV panels		336	EA				50	/MH	$ 127.80	$ 6,390	$ 6,390
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		336	EA				14	/MH	$ 127.80	$ 1,789	$ 1,789
			Demo conduit from rack to tie point		1	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Demo conduit from rack to transformer		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Demo conduit from combiners to inverter		1	EA				48	/MH	$ 127.80	$ 6,134	$ 6,134
			Remove Conduits to inverters		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Remove inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove PV panel and place in dumpster		336	EA				168	/MH	$ 127.80	$ 21,470	$ 21,470
			Remove points where panel is fixed to roof		336	EA				75	/MH	$ 127.80	$ 9,585	$ 9,585
			Remove lightning projection and other auxiliary equipment		1	EA				32	/MH	$ 127.80	$ 4,090	$ 4,090
			Remove transformer		1	LT				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Demolition				***$ -***	***$ -***	***$ -***				***$ 64,167***	***$ 64,167***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.23	TN		$ (40)			/MH			$ (40)
			Steel	Service rack components	0.09	TN		$ (16)			/MH			$ (16)
			Steel	Conduit and fittings	0.09	TN		$ (16)			/MH			$ (16)
			Steel	Transformers	2.74	TN		$ (480)			/MH			$ (480)
			Steel	Roof ladder, 1@ 350 lb each	0.03	TN		$ (5)			/MH			$ (5)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	2.29	TN		$ (2,684)			/MH			$ (2,684)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.08	TN		$ (195)			/MH			$ (195)
			Copper	Wire	0.51	TN		$ (1,244)			/MH			$ (1,244)
			Copper	Transformers	1.3	TN		$ (3,172)			/MH			$ (3,172)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	2688	LB		$ (1,636)			/MH			$ (1,636)
			Conduit and fittings	100 @ 1 lb each	18.79	LB		$ (11)			/MH			$ (11)
			Scrap Value				***$ -***	***$ (9,499)***	***$ -***				***$ -***	***$ (9,499)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	2	EA	$ 3,600				/MH			$ 3,600
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 4,780***	***$ -***	***$ -***				***$ -***	***$ 4,780***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	336	EA	$ 55,440				/MH	$ -		$ 55,440
			Architectual				***$ 55,440***	***$ -***	***$ -***				***$ -***	***$ 55,440***
Direct Costs														*$ 114,888*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 85,220*	*$ (9,499)*	*$ -*				*$ 64,167*	*$ 139,888*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 9,792
		91.10	Contractor's Profit											$ 13,989
														$ 23,781
Direct Costs + Construction Indirect Costs							*$ 85,220*	*$ (9,499)*	*$ -*				*$ 64,167*	*$ 163,669*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 9,820
		93.2	Construction Management Support											$ 3,273
		93.3	SDG&E Internal Costs											$ 16,367
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 12,783							$ 12,783
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 9,625	$ 9,625
		95.5	Contingency on Indirect											$ 4,419
Total							**$ 98,003**	**$ (9,499)**	**$ -**				**$ 73,792**	**$ 219,957**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
1S	UCO	Urban Corps	3105 Jefferson St, San Diego	Roof	PV	6/17/2010	22.80	117

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top													
	11.00.00		**Demolition**										
		11.22.00	*Concrete*										
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				4 /MH	$ 140.47	$ 562	$ 562
		11.41.00	*Electrical Equipment*										
			Disconnect wiring and components at service rack		1	EA				4 /MH	$ 127.80	$ 511	$ 511
			Disconnect wiring at inverter		1	EA				1 /MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		1	EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Pull wire from combiners to inverter		1	EA				7 /MH	$ 127.80	$ 895	$ 895
			Disconnect and remove wiring at PV panels		117	EA				18 /MH	$ 127.80	$ 2,300	$ 2,300
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		117	EA				5 /MH	$ 127.80	$ 639	$ 639
			Demo conduit from rack to tie point		1	EA				4 /MH	$ 127.80	$ 511	$ 511
			Demo conduit from rack to transformer		1	EA				3 /MH	$ 127.80	$ 383	$ 383
			Demo conduit from combiners to inverter		1	EA				17 /MH	$ 127.80	$ 2,173	$ 2,173
			Remove Conduits to inverters		1	EA				1 /MH	$ 127.80	$ 128	$ 128
			Remove inverters		1	EA				2 /MH	$ 127.80	$ 256	$ 256
			Remove PV panel and place in dumpster		117	EA				59 /MH	$ 127.80	$ 7,540	$ 7,540
			Remove points where panel is fixed to roof		117	EA				26 /MH	$ 127.80	$ 3,323	$ 3,323
			Remove lightning projection and other auxiliary equipment		1	EA				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Remove transformer		1	LT				4 /MH	$ 127.80	$ 511	$ 511
			Demolition				***$ -***	***$ -***	***$ -***			***$ 22,416***	***$ 22,416***
	18.00.00		**Scrap Value**										
		18.10.00	*Mixed Steel*										
			Steel	1 EA, inverter 402 kW	0.08	TN		$ (14)		/MH			$ (14)
			Steel	Service rack components	0.03	TN		$ (5)		/MH			$ (5)
			Steel	Conduit and fittings	0.03	TN		$ (5)		/MH			$ (5)
			Steel	Transformers	0.95	TN		$ (166)		/MH			$ (166)
			Steel	Roof ladder, 1@ 350 lb each	0.01	TN		$ (2)		/MH			$ (2)
		18.20.00	*Stainless Steel*										
			Stainless Steel	1788 Racks, 13.61 lbs each	0.8	TN		$ (938)		/MH			$ (938)
		18.30.00	*Copper*										
			Copper	1 EA, 402 kW inverter	0.03	TN		$ (73)		/MH			$ (73)
			Copper	Wire	0.18	TN		$ (439)		/MH			$ (439)
			Copper	Transformers	0.45	TN		$ (1,098)		/MH			$ (1,098)
		18.50.00	*Aluminum*										
			PV Module	1788 Modules @ 8 lbs each	936	LB		$ (570)		/MH			$ (570)
			Conduit and fittings	100 @ 1 lb each	6.54	LB		$ (4)		/MH			$ (4)
			Scrap Value				***$ -***	***$ (3,314)***	***$ -***			***$ -***	***$ (3,314)***
	21.00.00		**Civil Work**										
		21.19.00	*Disposal*										
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800			/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*										
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280			/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***			***$ -***	***$ 2,980***
	24.00.00		**Architectural**										
		24.37.00	*Roofing*										
			Roof repair at fix points	Installation	117	EA	$ 19,305			/MH		$ -	$ 19,305
			Architectual				***$ 19,305***	***$ -***	***$ -***			***$ -***	***$ 19,305***
Direct Costs													*$ 41,387*
	61.00.00		**Construction Indirect**										
		61.99.00	*Miscellaneous*										
			Downspout / Chute		1	LS	$ 25,000			/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal							*$ 47,285*	*$ (3,314)*	*$ -*			*$ 22,416*	*$ 66,387*
	91.00.00		**Other Direct & Construction Indirect Costs**										
		91.09	Contractor's General and Administration Expense										$ 4,647
		91.10	Contractor's Profit										$ 6,639
													$ 11,286
Direct Costs + Construction Indirect Costs							*$ 47,285*	*$ (3,314)*	*$ -*			*$ 22,416*	*$ 77,672*
	93.00.00		**Indirect Costs**										
		93.1	Engineering, Procurement, & Project Services										$ 4,660
		93.2	Construction Management Support										$ 1,553
		93.3	SDG&E Internal Costs										$ 7,767
	95.00.00		**Contingency**										
		95.1	Contingency on Subcontractor				$ 7,093						$ 7,093
		95.2	Contingency on Scrap Value					$ -					$ -
		95.3	Contingency on Material						$ -				$ -
		95.4	Contingency on Labor									$ 3,362	$ 3,362
		95.5	Contingency on Indirect										$ 2,097
Total							**$ 54,378**	**$ (3,314)**	**$ -**			**$ 25,778**	**$ 104,206**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
16	PRS	Pacific Ridge School	6269 El Fuerte St., Carlsbad	Roof	PV	1/27/2011	20.90	102

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				3	/MH	$ 140.47	$ 421	$ 421
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Disconnect wiring at inverter		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		1	EA				8	/MH	$ 127.80	$ 1,022	$ 1,022
			Pull wire from combiners to inverter		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Disconnect and remove wiring at PV panels		102	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		102	EA				4	/MH	$ 127.80	$ 511	$ 511
			Demo conduit from rack to tie point		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Demo conduit from rack to transformer		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Demo conduit from combiners to inverter		1	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Remove Conduits to inverters		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Remove inverters		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Remove PV panel and place in dumpster		102	EA				51	/MH	$ 127.80	$ 6,518	$ 6,518
			Remove points where panel is fixed to roof		102	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Remove lightning projection and other auxiliary equipment		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Remove transformer		1	LT				4	/MH	$ 127.80	$ 511	$ 511
			Demolition				***$ -***	***$ -***	***$ -***				***$ 19,591***	***$ 19,591***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.07	TN		$ (12)			/MH			$ (12)
			Steel	Service rack components	0.03	TN		$ (5)			/MH			$ (5)
			Steel	Conduit and fittings	0.03	TN		$ (5)			/MH			$ (5)
			Steel	Transformers	0.83	TN		$ (145)			/MH			$ (145)
			Steel	Roof ladder, 1@ 350 lb each	0.01	TN		$ (2)			/MH			$ (2)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	0.69	TN		$ (809)			/MH			$ (809)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.02	TN		$ (49)			/MH			$ (49)
			Copper	Wire	0.16	TN		$ (390)			/MH			$ (390)
			Copper	Transformers	0.39	TN		$ (952)			/MH			$ (952)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	816	LB		$ (497)			/MH			$ (497)
			Conduit and fittings	100 @ 1 lb each	5.7	LB		$ (3)			/MH			$ (3)
			Scrap Value				***$ -***	***$ (2,869)***	***$ -***				***$ -***	***$ (2,869)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	102	EA	$ 16,830				/MH		$ -	$ 16,830
			Architectual				***$ 16,830***	***$ -***	***$ -***				***$ -***	***$ 16,830***
Direct Costs														*$ 36,532*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 44,810*	*$ (2,869)*	*$ -*				*$ 19,591*	*$ 61,532*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 4,307
		91.10	Contractor's Profit											$ 6,153
														$ 10,460
Direct Costs + Construction Indirect Costs							*$ 44,810*	*$ (2,869)*	*$ -*				*$ 19,591*	*$ 71,993*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 4,320
		93.2	Construction Management Support											$ 1,440
		93.3	SDG&E Internal Costs											$ 7,199
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 6,722							$ 6,722
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 2,939	$ 2,939
		95.5	Contingency on Indirect											$ 1,944
Total							**$ 51,532**	**$ (2,869)**	**$ -**				**$ 22,530**	**$ 96,555**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
17	SBR	Sanford Burnham Medical Research	10905 Road to the Cure, La Jolla	Roof	PV	1/28/2011	200.20	712

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				24 /MH	$ 140.47	$ 3,371	$ 3,371
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Disconnect wiring at inverter		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at combiner boxes, remove boxes		5 EA				57 /MH	$ 127.80	$ 7,285	$ 7,285
			Pull wire from combiners to inverter		5 EA				41 /MH	$ 127.80	$ 5,240	$ 5,240
			Disconnect and remove wiring at PV panels		712 EA				107 /MH	$ 127.80	$ 13,675	$ 13,675
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		712 EA				29 /MH	$ 127.80	$ 3,706	$ 3,706
			Demo conduit from rack to tie point		1 EA				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Demo conduit from rack to transformer		1 EA				19 /MH	$ 127.80	$ 2,428	$ 2,428
			Demo conduit from combiners to inverter		1 EA				102 /MH	$ 127.80	$ 13,036	$ 13,036
			Remove Conduits to inverters		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Remove inverters		1 EA				10 /MH	$ 127.80	$ 1,278	$ 1,278
			Remove PV panel and place in dumpster		712 EA				356 /MH	$ 127.80	$ 45,497	$ 45,497
			Remove points where panel is fixed to roof		712 EA				159 /MH	$ 127.80	$ 20,320	$ 20,320
			Remove lightning projection and other auxiliary equipment		1 EA				67 /MH	$ 127.80	$ 8,563	$ 8,563
			Remove transformer		1 LT				26 /MH	$ 127.80	$ 3,323	$ 3,323
			Demolition			***$ -***	***$ -***	***$ -***			***$ 135,644***	***$ 135,644***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.5 TN		$ (88)		/MH			$ (88)
			Steel	Service rack components	0.19 TN		$ (33)		/MH			$ (33)
			Steel	Conduit and fittings	0.2 TN		$ (35)		/MH			$ (35)
			Steel	Transformers	5.8 TN		$ (1,015)		/MH			$ (1,015)
			Steel	Roof ladder, 1@ 350 lb each	0.07 TN		$ (12)		/MH			$ (12)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	4.85 TN		$ (5,684)		/MH			$ (5,684)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.16 TN		$ (390)		/MH			$ (390)
			Copper	Wire	1.08 TN		$ (2,635)		/MH			$ (2,635)
			Copper	Transformers	2.76 TN		$ (6,734)		/MH			$ (6,734)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	5696 LB		$ (3,466)		/MH			$ (3,466)
			Conduit and fittings	100 @ 1 lb each	39.82 LB		$ (24)		/MH			$ (24)
			Scrap Value			***$ -***	***$ (20,117)***	***$ -***			***$ -***	***$ (20,117)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4 EA	$ 7,200			/MH			$ 7,200
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 8,380***	***$ -***	***$ -***			***$ -***	***$ 8,380***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	712 EA	$ 117,480			/MH		$ -	$ 117,480
			Architectual			***$ 117,480***	***$ -***	***$ -***			***$ -***	***$ 117,480***
Direct Costs												*$ 241,387*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 150,860*	*$ (20,117)*	*$ -*			*$ 135,644*	*$ 266,387*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 18,647
		91.10	Contractor's Profit									$ 26,639
												$ 45,286
Direct Costs + Construction Indirect Costs						*$ 150,860*	*$ (20,117)*	*$ -*			*$ 135,644*	*$ 311,673*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 18,700
		93.2	Construction Management Support									$ 6,233
		93.3	SDG&E Internal Costs									$ 31,167
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 22,629						$ 22,629
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 20,347	$ 20,347
		95.5	Contingency on Indirect									$ 8,415
Total						**$ 173,489**	**$ (20,117)**	**$ -**			**$ 155,991**	**$ 419,164**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
18	HCK	High Tech High Chula Vista K-8	1949 Discovery Falls Drive, Chula Vista	Roof	PV	8/8/2011	130.10	644

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				22	/MH	$ 140.47	$ 3,090	$ 3,090
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Disconnect wiring at inverter		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at combiner boxes, remove boxes		5	EA				52	/MH	$ 127.80	$ 6,646	$ 6,646
			Pull wire from combiners to inverter		5	EA				37	/MH	$ 127.80	$ 4,729	$ 4,729
			Disconnect and remove wiring at PV panels		644	EA				97	/MH	$ 127.80	$ 12,397	$ 12,397
			Disconnect and remove grounding at PV panels and racks,											
			Remove ground rods		644	EA				26	/MH	$ 127.80	$ 3,323	$ 3,323
			Demo conduit from rack to tie point		1	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Demo conduit from rack to transformer		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Demo conduit from combiners to inverter		1	EA				92	/MH	$ 127.80	$ 11,758	$ 11,758
			Remove Conduits to inverters		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Remove inverters		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Remove PV panel and place in dumpster		644	EA				322	/MH	$ 127.80	$ 41,152	$ 41,152
			Remove points where panel is fixed to roof		644	EA				144	/MH	$ 127.80	$ 18,403	$ 18,403
			Remove lightning projection and other auxiliary equipment		1	EA				61	/MH	$ 127.80	$ 7,796	$ 7,796
			Remove transformer		1	LT				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Demolition				***$ -***	***$ -***	***$ -***				***$ 122,967***	***$ 122,967***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.45	TN		$ (79)			/MH			$ (79)
			Steel	Service rack components	0.17	TN		$ (30)			/MH			$ (30)
			Steel	Conduit and fittings	0.18	TN		$ (32)			/MH			$ (32)
			Steel	Transformers	5.25	TN		$ (919)			/MH			$ (919)
			Steel	Roof ladder, 1@ 350 lb each	0.06	TN		$ (11)			/MH			$ (11)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	4.38	TN		$ (5,133)			/MH			$ (5,133)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.14	TN		$ (342)			/MH			$ (342)
			Copper	Wire	0.98	TN		$ (2,391)			/MH			$ (2,391)
			Copper	Transformers	2.49	TN		$ (6,076)			/MH			$ (6,076)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	5152	LB		$ (3,135)			/MH			$ (3,135)
			Conduit and fittings	100 @ 1 lb each	36.02	LB		$ (22)			/MH			$ (22)
			Scrap Value				***$ -***	***$ (18,168)***	***$ -***				***$ -***	***$ (18,168)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4	EA	$ 7,200				/MH			$ 7,200
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 8,380***	***$ -***	***$ -***				***$ -***	***$ 8,380***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	644	EA	$ 106,260				/MH	$ -		$ 106,260
			Architectual				***$ 106,260***	***$ -***	***$ -***				***$ -***	***$ 106,260***
Direct Costs														*$ 219,439*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 139,640*	*$ (18,168)*	*$ -*				*$ 122,967*	*$ 244,439*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 17,111
		91.10	Contractor's Profit											$ 24,444
														$ 41,555
Direct Costs + Construction Indirect Costs							*$ 139,640*	*$ (18,168)*	*$ -*				*$ 122,967*	*$ 285,993*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 17,160
		93.2	Construction Management Support											$ 5,720
		93.3	SDG&E Internal Costs											$ 28,599
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 20,946							$ 20,946
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 18,445	$ 18,445
		95.5	Contingency on Indirect											$ 7,722
Total							**$ 160,586**	**$ (18,168)**	**$ -**				**$ 141,412**	**$ 384,585**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
19	CSM	CSUSM - Public Safety Building	Campus View Dr & La Moree Rd, San Marcos	Roof	PV	1/19/2012	37.10	180

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				6	/MH	$ 140.47	$ 843	$ 843
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Disconnect wiring at inverter		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		1	EA				14	/MH	$ 127.80	$ 1,789	$ 1,789
			Pull wire from combiners to inverter		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect and remove wiring at PV panels		180	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		180	EA				7	/MH	$ 127.80	$ 895	$ 895
			Demo conduit from rack to tie point		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Demo conduit from rack to transformer		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Demo conduit from combiners to inverter		1	EA				26	/MH	$ 127.80	$ 3,323	$ 3,323
			Remove Conduits to inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove PV panel and place in dumpster		180	EA				90	/MH	$ 127.80	$ 11,502	$ 11,502
			Remove points where panel is fixed to roof		180	EA				40	/MH	$ 127.80	$ 5,112	$ 5,112
			Remove lightning projection and other auxiliary equipment		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Remove transformer		1	LT				7	/MH	$ 127.80	$ 895	$ 895
			Demolition				***$ -***	***$ -***	***$ -***				***$ 34,199***	***$ 34,199***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.13	TN		$ (23)			/MH			$ (23)
			Steel	Service rack components	0.05	TN		$ (9)			/MH			$ (9)
			Steel	Conduit and fittings	0.05	TN		$ (9)			/MH			$ (9)
			Steel	Transformers	1.47	TN		$ (257)			/MH			$ (257)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.23	TN		$ (1,442)			/MH			$ (1,442)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.04	TN		$ (98)			/MH			$ (98)
			Copper	Wire	0.27	TN		$ (659)			/MH			$ (659)
			Copper	Transformers	0.7	TN		$ (1,708)			/MH			$ (1,708)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	1440	LB		$ (876)			/MH			$ (876)
			Conduit and fittings	100 @ 1 lb each	10.07	LB		$ (6)			/MH			$ (6)
			Scrap Value				***$ -***	***$ (5,089)***	***$ -***				***$ -***	***$ (5,089)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	180	EA	$ 29,700				/MH	$ -		$ 29,700
			Architectual				***$ 29,700***	***$ -***	***$ -***				***$ -***	***$ 29,700***
Direct Costs														*$ 61,789*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 57,680*	*$ (5,089)*	*$ -*				*$ 34,199*	*$ 86,789*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 6,075
		91.10	Contractor's Profit											$ 8,679
														$ 14,754
Direct Costs + Construction Indirect Costs							*$ 57,680*	*$ (5,089)*	*$ -*				*$ 34,199*	*$ 101,543*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 6,093
		93.2	Construction Management Support											$ 2,031
		93.3	SDG&E Internal Costs											$ 10,154
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 8,652							$ 8,652
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 5,130	$ 5,130
		95.5	Contingency on Indirect											$ 2,742
Total							**$ 66,332**	**$ (5,089)**	**$ -**				**$ 39,328**	**$ 136,345**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
20	EIR	SDG&E EIC (roof)	4760 Clairemont Mesa Blvd, San Diego	Roof	PV	1/5/2012	47.33	234

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				8 /MH	$ 140.47	$ 1,124	$ 1,124
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Disconnect wiring at inverter		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		2 EA				19 /MH	$ 127.80	$ 2,428	$ 2,428
			Pull wire from combiners to inverter		2 EA				14 /MH	$ 127.80	$ 1,789	$ 1,789
			Disconnect and remove wiring at PV panels		234 EA				35 /MH	$ 127.80	$ 4,473	$ 4,473
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		234 EA				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Demo conduit from rack to tie point		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Demo conduit from rack to transformer		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Demo conduit from combiners to inverter		1 EA				34 /MH	$ 127.80	$ 4,345	$ 4,345
			Remove Conduits to inverters		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Remove inverters		1 EA				3 /MH	$ 127.80	$ 383	$ 383
			Remove PV panel and place in dumpster		234 EA				117 /MH	$ 127.80	$ 14,953	$ 14,953
			Remove points where panel is fixed to roof		234 EA				52 /MH	$ 127.80	$ 6,646	$ 6,646
			Remove lightning projection and other auxiliary equipment		1 EA				22 /MH	$ 127.80	$ 2,812	$ 2,812
			Remove transformer		1 LT				9 /MH	$ 127.80	$ 1,150	$ 1,150
			Demolition			***$ -***	***$ -***	***$ -***			***$ 44,576***	***$ 44,576***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.16 TN		$ (28)		/MH			$ (28)
			Steel	Service rack components	0.06 TN		$ (11)		/MH			$ (11)
			Steel	Conduit and fittings	0.07 TN		$ (12)		/MH			$ (12)
			Steel	Transformers	1.91 TN		$ (334)		/MH			$ (334)
			Steel	Roof ladder, 1@ 350 lb each	0.02 TN		$ (4)		/MH			$ (4)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	1.59 TN		$ (1,863)		/MH			$ (1,863)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.05 TN		$ (122)		/MH			$ (122)
			Copper	Wire	0.36 TN		$ (878)		/MH			$ (878)
			Copper	Transformers	0.91 TN		$ (2,220)		/MH			$ (2,220)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	1872 LB		$ (1,139)		/MH			$ (1,139)
			Conduit and fittings	100 @ 1 lb each	13.09 LB		$ (8)		/MH			$ (8)
			Scrap Value			***$ -***	***$ (6,620)***	***$ -***			***$ -***	***$ (6,620)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1 EA	$ 1,800			/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 2,980***	***$ -***	***$ -***			***$ -***	***$ 2,980***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	234 EA	$ 38,610			/MH		$ -	$ 38,610
			Architectual			***$ 38,610***	***$ -***	***$ -***			***$ -***	***$ 38,610***
Direct Costs												*$ 79,546*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 66,590*	*$ (6,620)*	*$ -*			*$ 44,576*	*$ 104,546*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 7,318
		91.10	Contractor's Profit									$ 10,455
												$ 17,773
Direct Costs + Construction Indirect Costs						*$ 66,590*	*$ (6,620)*	*$ -*			*$ 44,576*	*$ 122,319*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 7,339
		93.2	Construction Management Support									$ 2,446
		93.3	SDG&E Internal Costs									$ 12,232
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 9,989						$ 9,989
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 6,686	$ 6,686
		95.5	Contingency on Indirect									$ 3,303
Total						**$ 76,579**	**$ (6,620)**	**$ -**			**$ 51,262**	**$ 164,314**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
21	UCR	UCSD - Revelle College	9500 Gilman Dr, La Jolla	Roof	PV	10/13/2011	40.70	196

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				7	/MH	$ 140.47	$ 983	$ 983
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				7	/MH	$ 127.80	$ 895	$ 895
			Disconnect wiring at inverter		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		1	EA				16	/MH	$ 127.80	$ 2,045	$ 2,045
			Pull wire from combiners to inverter		1	EA				11	/MH	$ 127.80	$ 1,406	$ 1,406
			Disconnect and remove wiring at PV panels		196	EA				29	/MH	$ 127.80	$ 3,706	$ 3,706
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		196	EA				8	/MH	$ 127.80	$ 1,022	$ 1,022
			Demo conduit from rack to tie point		1	EA				7	/MH	$ 127.80	$ 895	$ 895
			Demo conduit from rack to transformer		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Demo conduit from combiners to inverter		1	EA				28	/MH	$ 127.80	$ 3,578	$ 3,578
			Remove Conduits to inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove inverters		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Remove PV panel and place in dumpster		196	EA				98	/MH	$ 127.80	$ 12,524	$ 12,524
			Remove points where panel is fixed to roof		196	EA				44	/MH	$ 127.80	$ 5,623	$ 5,623
			Remove lightning projection and other auxiliary equipment		1	EA				18	/MH	$ 127.80	$ 2,300	$ 2,300
			Remove transformer		1	LT				7	/MH	$ 127.80	$ 895	$ 895
			Demolition				***$ -***	***$ -***	***$ -***				***$ 37,406***	***$ 37,406***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.14	TN		$ (25)			/MH			$ (25)
			Steel	Service rack components	0.05	TN		$ (9)			/MH			$ (9)
			Steel	Conduit and fittings	0.05	TN		$ (9)			/MH			$ (9)
			Steel	Transformers	1.6	TN		$ (280)			/MH			$ (280)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.33	TN		$ (1,559)			/MH			$ (1,559)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.04	TN		$ (98)			/MH			$ (98)
			Copper	Wire	0.3	TN		$ (732)			/MH			$ (732)
			Copper	Transformers	0.76	TN		$ (1,854)			/MH			$ (1,854)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	1568	LB		$ (954)			/MH			$ (954)
			Conduit and fittings	100 @ 1 lb each	10.96	LB		$ (7)			/MH			$ (7)
			Scrap Value				***$ -***	***$ (5,529)***	***$ -***				***$ -***	***$ (5,529)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	196	EA	$ 32,340				/MH		$ -	$ 32,340
			Architectual				***$ 32,340***	***$ -***	***$ -***				***$ -***	***$ 32,340***
Direct Costs														*$ 67,197*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 60,320*	*$ (5,529)*	*$ -*				*$ 37,406*	*$ 92,197*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 6,454
		91.10	Contractor's Profit											$ 9,220
														$ 15,674
Direct Costs + Construction Indirect Costs							*$ 60,320*	*$ (5,529)*	*$ -*				*$ 37,406*	*$ 107,871*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 6,472
		93.2	Construction Management Support											$ 2,157
		93.3	SDG&E Internal Costs											$ 10,787
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 9,048							$ 9,048
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 5,611	$ 5,611
		95.5	Contingency on Indirect											$ 2,913
Total							**$ 69,368**	**$ (5,529)**	**$ -**				**$ 43,017**	**$ 144,859**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
22	SLD	Soledad	6465 Nancy Ridge Rd, San Diego	Roof	PV	1/30/2012	99.58	462

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				16	/MH	$ 140.47	$ 2,248	$ 2,248
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Disconnect wiring at inverter		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Disconnect wiring at combiner boxes, remove boxes		3	EA				37	/MH	$ 127.80	$ 4,729	$ 4,729
			Pull wire from combiners to inverter		3	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Disconnect and remove wiring at PV panels		462	EA				69	/MH	$ 127.80	$ 8,818	$ 8,818
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		462	EA				19	/MH	$ 127.80	$ 2,428	$ 2,428
			Demo conduit from rack to tie point		1	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Demo conduit from rack to transformer		1	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Demo conduit from combiners to inverter		1	EA				66	/MH	$ 127.80	$ 8,435	$ 8,435
			Remove Conduits to inverters		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Remove inverters		1	EA				6	/MH	$ 127.80	$ 767	$ 767
			Remove PV panel and place in dumpster		462	EA				231	/MH	$ 127.80	$ 29,522	$ 29,522
			Remove points where panel is fixed to roof		462	EA				103	/MH	$ 127.80	$ 13,163	$ 13,163
			Remove lightning projection and other auxiliary equipment		1	EA				43	/MH	$ 127.80	$ 5,495	$ 5,495
			Remove transformer		1	LT				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Demolition				***$ -***	***$ -***	***$ -***				***$ 88,129***	***$ 88,129***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.32	TN		$ (56)			/MH			$ (56)
			Steel	Service rack components	0.12	TN		$ (21)			/MH			$ (21)
			Steel	Conduit and fittings	0.13	TN		$ (23)			/MH			$ (23)
			Steel	Transformers	3.76	TN		$ (658)			/MH			$ (658)
			Steel	Roof ladder, 1@ 350 lb each	0.05	TN		$ (9)			/MH			$ (9)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	3.14	TN		$ (3,680)			/MH			$ (3,680)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.1	TN		$ (244)			/MH			$ (244)
			Copper	Wire	0.7	TN		$ (1,708)			/MH			$ (1,708)
			Copper	Transformers	1.79	TN		$ (4,368)			/MH			$ (4,368)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	3696	LB		$ (2,249)			/MH			$ (2,249)
			Conduit and fittings	100 @ 1 lb each	25.84	LB		$ (16)			/MH			$ (16)
			Scrap Value				***$ -***	***$ (13,031)***	***$ -***				***$ -***	***$ (13,031)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3	EA	$ 5,400				/MH			$ 5,400
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 6,580***	***$ -***	***$ -***				***$ -***	***$ 6,580***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	462	EA	$ 76,230				/MH		$ -	$ 76,230
			Architectual				***$ 76,230***	***$ -***	***$ -***				***$ -***	***$ 76,230***
Direct Costs														*$ 157,908*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 107,810*	*$ (13,031)*	*$ -*				*$ 88,129*	*$ 182,908*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 12,804
		91.10	Contractor's Profit											$ 18,291
														$ 31,094
Direct Costs + Construction Indirect Costs							*$ 107,810*	*$ (13,031)*	*$ -*				*$ 88,129*	*$ 214,003*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 12,840
		93.2	Construction Management Support											$ 4,280
		93.3	SDG&E Internal Costs											$ 21,400
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 16,172							$ 16,172
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 13,219	$ 13,219
		95.5	Contingency on Indirect											$ 5,778
Total							**$ 123,982**	**$ (13,031)**	**$ -**				**$ 101,348**	**$ 287,692**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
23	PST	Pacific Station	687 South Coast Highway 101, Encinitas	Roof	PV	5/15/2012	109	498

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Roof top												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7 /CY				17 /MH	$ 140.47	$ 2,388	$ 2,388
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				18 /MH	$ 127.80	$ 2,300	$ 2,300
			Disconnect wiring at inverter		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Disconnect wiring at combiner boxes, remove boxes		4 EA				40 /MH	$ 127.80	$ 5,112	$ 5,112
			Pull wire from combiners to inverter		4 EA				29 /MH	$ 127.80	$ 3,706	$ 3,706
			Disconnect and remove wiring at PV panels		498 EA				75 /MH	$ 127.80	$ 9,585	$ 9,585
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		498 EA				20 /MH	$ 127.80	$ 2,556	$ 2,556
			Demo conduit from rack to tie point		1 EA				18 /MH	$ 127.80	$ 2,300	$ 2,300
			Demo conduit from rack to transformer		1 EA				13 /MH	$ 127.80	$ 1,661	$ 1,661
			Demo conduit from combiners to inverter		1 EA				71 /MH	$ 127.80	$ 9,074	$ 9,074
			Remove Conduits to inverters		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Remove inverters		1 EA				7 /MH	$ 127.80	$ 895	$ 895
			Remove PV panel and place in dumpster		498 EA				249 /MH	$ 127.80	$ 31,822	$ 31,822
			Remove points where panel is fixed to roof		498 EA				111 /MH	$ 127.80	$ 14,186	$ 14,186
			Remove lightning projection and other auxiliary equipment		1 EA				47 /MH	$ 127.80	$ 6,007	$ 6,007
			Remove transformer		1 LT				18 /MH	$ 127.80	$ 2,300	$ 2,300
			Demolition			***$ -***	***$ -***	***$ -***			***$ 94,915***	***$ 94,915***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, inverter 402 kW	0.35 TN		$ (61)		/MH			$ (61)
			Steel	Service rack components	0.13 TN		$ (23)		/MH			$ (23)
			Steel	Conduit and fittings	0.14 TN		$ (25)		/MH			$ (25)
			Steel	Transformers	4.06 TN		$ (711)		/MH			$ (711)
			Steel	Roof ladder, 1@ 350 lb each	0.05 TN		$ (9)		/MH			$ (9)
		18.20.00	*Stainless Steel*									
			Stainless Steel	1788 Racks, 13.61 lbs each	3.39 TN		$ (3,973)		/MH			$ (3,973)
		18.30.00	*Copper*									
			Copper	1 EA, 402 kW inverter	0.11 TN		$ (268)		/MH			$ (268)
			Copper	Wire	0.76 TN		$ (1,854)		/MH			$ (1,854)
			Copper	Transformers	1.93 TN		$ (4,709)		/MH			$ (4,709)
		18.50.00	*Aluminum*									
			PV Module	1788 Modules @ 8 lbs each	3984 LB		$ (2,424)		/MH			$ (2,424)
			Conduit and fittings	100 @ 1 lb each	27.85 LB		$ (17)		/MH			$ (17)
			Scrap Value			***$ -***	***$ (14,074)***	***$ -***			***$ -***	***$ (14,074)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3 EA	$ 5,400			/MH			$ 5,400
			Dumpster, 40 CY Capacity	Fix point rods	1 EA	$ 900			/MH			$ 900
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	7 /CY	$ 280			/MH			$ 280
			Civil Work			***$ 6,580***	***$ -***	***$ -***			***$ -***	***$ 6,580***
	24.00.00		**Architectural**									
		24.37.00	*Roofing*									
			Roof repair at fix points	Installation	498 EA	$ 82,170			/MH		$ -	$ 82,170
			Architectual			***$ 82,170***	***$ -***	***$ -***			***$ -***	***$ 82,170***
Direct Costs												*$ 169,591*
	61.00.00		**Construction Indirect**									
		61.99.00	*Miscellaneous*									
			Downspout / Chute		1 LS	$ 25,000			/MH			$ 25,000
			Construction Indirect			***$ 25,000***	***$ -***	***$ -***			***$ -***	***$ 25,000***
Subtotal						*$ 113,750*	*$ (14,074)*	*$ -*			*$ 94,915*	*$ 194,591*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 13,621
		91.10	Contractor's Profit									$ 19,459
												$ 33,080
Direct Costs + Construction Indirect Costs						*$ 113,750*	*$ (14,074)*	*$ -*			*$ 94,915*	*$ 227,672*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 13,660
		93.2	Construction Management Support									$ 4,553
		93.3	SDG&E Internal Costs									$ 22,767
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 17,063						$ 17,063
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 14,237	$ 14,237
		95.5	Contingency on Indirect									$ 6,147
Total						**$ 130,813**	**$ (14,074)**	**$ -**			**$ 109,152**	**$ 306,099**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
24	UCS	UCSD - Structural & Materials Engr	Voigt Drive and Matthews Lane	Roof	PV	10/22/2012	119.93	566

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				19	/MH	$ 140.47	$ 2,669	$ 2,669
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Disconnect wiring at inverter		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Disconnect wiring at combiner boxes, remove boxes		4	EA				45	/MH	$ 127.80	$ 5,751	$ 5,751
			Pull wire from combiners to inverter		4	EA				33	/MH	$ 127.80	$ 4,217	$ 4,217
			Disconnect and remove wiring at PV panels		566	EA				85	/MH	$ 127.80	$ 10,863	$ 10,863
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		566	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Demo conduit from rack to tie point		1	EA				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Demo conduit from rack to transformer		1	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Demo conduit from combiners to inverter		1	EA				81	/MH	$ 127.80	$ 10,352	$ 10,352
			Remove Conduits to inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove inverters		1	EA				8	/MH	$ 127.80	$ 1,022	$ 1,022
			Remove PV panel and place in dumpster		566	EA				283	/MH	$ 127.80	$ 36,167	$ 36,167
			Remove points where panel is fixed to roof		566	EA				127	/MH	$ 127.80	$ 16,231	$ 16,231
			Remove lightning projection and other auxiliary equipment		1	EA				53	/MH	$ 127.80	$ 6,773	$ 6,773
			Remove transformer		1	LT				21	/MH	$ 127.80	$ 2,684	$ 2,684
			Demolition				***$ -***	***$ -***	***$ -***				***$ 107,976***	***$ 107,976***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.4	TN		$ (70)			/MH			$ (70)
			Steel	Service rack components	0.15	TN		$ (26)			/MH			$ (26)
			Steel	Conduit and fittings	0.16	TN		$ (28)			/MH			$ (28)
			Steel	Transformers	4.61	TN		$ (807)			/MH			$ (807)
			Steel	Roof ladder, 1@ 350 lb each	0.06	TN		$ (11)			/MH			$ (11)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	3.85	TN		$ (4,512)			/MH			$ (4,512)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.13	TN		$ (317)			/MH			$ (317)
			Copper	Wire	0.86	TN		$ (2,098)			/MH			$ (2,098)
			Copper	Transformers	2.19	TN		$ (5,344)			/MH			$ (5,344)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	4528	LB		$ (2,755)			/MH			$ (2,755)
			Conduit and fittings	100 @ 1 lb each	31.66	LB		$ (19)			/MH			$ (19)
			Scrap Value				***$ -***	***$ (15,987)***	***$ -***				***$ -***	***$ (15,987)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3	EA	$ 5,400				/MH			$ 5,400
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 6,580***	***$ -***	***$ -***				***$ -***	***$ 6,580***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	566	EA	$ 93,390				/MH		$ -	$ 93,390
			Architectual				***$ 93,390***	***$ -***	***$ -***				***$ -***	***$ 93,390***
Direct Costs														*$ 191,959*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 124,970*	*$ (15,987)*	*$ -*				*$ 107,976*	*$ 216,959*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 15,187
		91.10	Contractor's Profit											$ 21,696
														$ 36,883
Direct Costs + Construction Indirect Costs							*$ 124,970*	*$ (15,987)*	*$ -*				*$ 107,976*	*$ 253,842*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 15,230
		93.2	Construction Management Support											$ 5,077
		93.3	SDG&E Internal Costs											$ 25,384
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 18,746							$ 18,746
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 16,196	$ 16,196
		95.5	Contingency on Indirect											$ 6,854
Total							**$ 143,716**	**$ (15,987)**	**$ -**				**$ 124,173**	**$ 341,329**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
25	UCM	UCSD MESOM	8880 Biological Grade, La Jolla, CA	Roof	PV/ES	6/14/2013	61.10	292

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				10	/MH	$ 140.47	$ 1,405	$ 1,405
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect wiring at inverter		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Disconnect wiring at combiner boxes, remove boxes		2	EA				23	/MH	$ 127.80	$ 2,939	$ 2,939
			Pull wire from combiners to inverter		2	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Disconnect and remove wiring at PV panels		292	EA				44	/MH	$ 127.80	$ 5,623	$ 5,623
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		292	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Demo conduit from rack to tie point		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Demo conduit from rack to transformer		1	EA				8	/MH	$ 127.80	$ 1,022	$ 1,022
			Demo conduit from combiners to inverter		1	EA				42	/MH	$ 127.80	$ 5,368	$ 5,368
			Remove Conduits to inverters		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Remove inverters		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Remove PV panel and place in dumpster		292	EA				146	/MH	$ 127.80	$ 18,659	$ 18,659
			Remove points where panel is fixed to roof		292	EA				65	/MH	$ 127.80	$ 8,307	$ 8,307
			Remove lightning projection and other auxiliary equipment		1	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Remove transformer		1	LT				11	/MH	$ 127.80	$ 1,406	$ 1,406
			Demolition				***$ -***	***$ -***	***$ -***				***$ 55,720***	***$ 55,720***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.2	TN		$ (35)			/MH			$ (35)
			Steel	Service rack components	0.08	TN		$ (14)			/MH			$ (14)
			Steel	Conduit and fittings	0.08	TN		$ (14)			/MH			$ (14)
			Steel	Transformers	2.38	TN		$ (417)			/MH			$ (417)
			Steel	Roof ladder, 1@ 350 lb each	0.03	TN		$ (5)			/MH			$ (5)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.99	TN		$ (2,332)			/MH			$ (2,332)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.07	TN		$ (171)			/MH			$ (171)
			Copper	Wire	0.44	TN		$ (1,074)			/MH			$ (1,074)
			Copper	Transformers	1.13	TN		$ (2,757)			/MH			$ (2,757)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	2336	LB		$ (1,421)			/MH			$ (1,421)
			Conduit and fittings	100 @ 1 lb each	16.33	LB		$ (10)			/MH			$ (10)
			Scrap Value				***$ -***	***$ (8,250)***	***$ -***				***$ -***	***$ (8,250)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	2	EA	$ 3,600				/MH			$ 3,600
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 4,780***	***$ -***	***$ -***				***$ -***	***$ 4,780***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	292	EA	$ 48,180				/MH		$ -	$ 48,180
			Architectual				***$ 48,180***	***$ -***	***$ -***				***$ -***	***$ 48,180***
Direct Costs														*$ 100,430*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 77,960*	*$ (8,250)*	*$ -*				*$ 55,720*	*$ 125,430*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 8,780
		91.10	Contractor's Profit											$ 12,543
														$ 21,323
Direct Costs + Construction Indirect Costs							*$ 77,960*	*$ (8,250)*	*$ -*				*$ 55,720*	*$ 146,753*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 8,805
		93.2	Construction Management Support											$ 2,935
		93.3	SDG&E Internal Costs											$ 14,675
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 11,694							$ 11,694
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 8,358	$ 8,358
		95.5	Contingency on Indirect											$ 3,962
Total							**$ 89,654**	**$ (8,250)**	**$ -**				**$ 64,078**	**$ 197,182**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
26	SAP	Village Lindo Paseo	5505 Lindo Paseo, San Diego, CA	Roof	PV/ES	6/20/2013	36.60	150

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				5	/MH	$ 140.47	$ 702	$ 702
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Disconnect wiring at inverter		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		1	EA				12	/MH	$ 127.80	$ 1,534	$ 1,534
			Pull wire from combiners to inverter		1	EA				9	/MH	$ 127.80	$ 1,150	$ 1,150
			Disconnect and remove wiring at PV panels		150	EA				22	/MH	$ 127.80	$ 2,812	$ 2,812
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		150	EA				6	/MH	$ 127.80	$ 767	$ 767
			Demo conduit from rack to tie point		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Demo conduit from rack to transformer		1	EA				4	/MH	$ 127.80	$ 511	$ 511
			Demo conduit from combiners to inverter		1	EA				21	/MH	$ 127.80	$ 2,684	$ 2,684
			Remove Conduits to inverters		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Remove inverters		1	EA				2	/MH	$ 127.80	$ 256	$ 256
			Remove PV panel and place in dumpster		150	EA				75	/MH	$ 127.80	$ 9,585	$ 9,585
			Remove points where panel is fixed to roof		150	EA				34	/MH	$ 127.80	$ 4,345	$ 4,345
			Remove lightning projection and other auxiliary equipment		1	EA				14	/MH	$ 127.80	$ 1,789	$ 1,789
			Remove transformer		1	LT				5	/MH	$ 127.80	$ 639	$ 639
			Demolition				***$ -***	***$ -***	***$ -***				***$ 28,307***	***$ 28,307***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.1	TN		$ (18)			/MH			$ (18)
			Steel	Service rack components	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Conduit and fittings	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Transformers	1.22	TN		$ (214)			/MH			$ (214)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	1.02	TN		$ (1,195)			/MH			$ (1,195)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.03	TN		$ (73)			/MH			$ (73)
			Copper	Wire	0.23	TN		$ (561)			/MH			$ (561)
			Copper	Transformers	0.58	TN		$ (1,415)			/MH			$ (1,415)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	1200	LB		$ (730)			/MH			$ (730)
			Conduit and fittings	100 @ 1 lb each	8.39	LB		$ (5)			/MH			$ (5)
			Scrap Value				***$ -***	***$ (4,229)***	***$ -***				***$ -***	***$ (4,229)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 2,980***	***$ -***	***$ -***				***$ -***	***$ 2,980***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	150	EA	$ 24,750				/MH		$ -	$ 24,750
			Architectual				***$ 24,750***	***$ -***	***$ -***				***$ -***	***$ 24,750***
Direct Costs														*$ 51,808*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 52,730*	*$ (4,229)*	*$ -*				*$ 28,307*	*$ 76,808*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 5,377
		91.10	Contractor's Profit											$ 7,681
														$ 13,057
Direct Costs + Construction Indirect Costs							*$ 52,730*	*$ (4,229)*	*$ -*				*$ 28,307*	*$ 89,866*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 5,392
		93.2	Construction Management Support											$ 1,797
		93.3	SDG&E Internal Costs											$ 8,987
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 7,910							$ 7,910
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 4,246	$ 4,246
		95.5	Contingency on Indirect											$ 2,426
Total							**$ 60,640**	**$ (4,229)**	**$ -**				**$ 32,553**	**$ 120,623**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Roof Mounted

Project ID	Code	Customer	Address	PV Location	Tech.	Date Energized	Facility Nameplate (kW)	Panel Qty
27	DLA	Del Lago Academy	1740 Scenic Trail Way, Escondido, CA	Roof	PV/ES	12/20/2013	172.80	750

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Roof top														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Electrical equipment (Transformer, inverter, etc.) pad	7	/CY				25	/MH	$ 140.47	$ 3,512	$ 3,512
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Disconnect wiring at inverter		1	EA				7	/MH	$ 127.80	$ 895	$ 895
			Disconnect wiring at combiner boxes, remove boxes		5	EA				60	/MH	$ 127.80	$ 7,668	$ 7,668
			Pull wire from combiners to inverter		5	EA				44	/MH	$ 127.80	$ 5,623	$ 5,623
			Disconnect and remove wiring at PV panels		750	EA				112	/MH	$ 127.80	$ 14,314	$ 14,314
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		750	EA				30	/MH	$ 127.80	$ 3,834	$ 3,834
			Demo conduit from rack to tie point		1	EA				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Demo conduit from rack to transformer		1	EA				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Demo conduit from combiners to inverter		1	EA				107	/MH	$ 127.80	$ 13,675	$ 13,675
			Remove Conduits to inverters		1	EA				7	/MH	$ 127.80	$ 895	$ 895
			Remove inverters		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Remove PV panel and place in dumpster		750	EA				375	/MH	$ 127.80	$ 47,925	$ 47,925
			Remove points where panel is fixed to roof		750	EA				168	/MH	$ 127.80	$ 21,470	$ 21,470
			Remove lightning projection and other auxiliary equipment		1	EA				70	/MH	$ 127.80	$ 8,946	$ 8,946
			Remove transformer		1	LT				27	/MH	$ 127.80	$ 3,451	$ 3,451
			Demolition				***$ -***	***$ -***	***$ -***				***$ 142,942***	***$ 142,942***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, inverter 402 kW	0.52	TN		$ (91)			/MH			$ (91)
			Steel	Service rack components	0.2	TN		$ (35)			/MH			$ (35)
			Steel	Conduit and fittings	0.21	TN		$ (37)			/MH			$ (37)
			Steel	Transformers	6.11	TN		$ (1,069)			/MH			$ (1,069)
			Steel	Roof ladder, 1@ 350 lb each	0.08	TN		$ (14)			/MH			$ (14)
		18.20.00	*Stainless Steel*											
			Stainless Steel	1788 Racks, 13.61 lbs each	5.1	TN		$ (5,977)			/MH			$ (5,977)
		18.30.00	*Copper*											
			Copper	1 EA, 402 kW inverter	0.17	TN		$ (415)			/MH			$ (415)
			Copper	Wire	1.14	TN		$ (2,782)			/MH			$ (2,782)
			Copper	Transformers	2.9	TN		$ (7,076)			/MH			$ (7,076)
		18.50.00	*Aluminum*											
			PV Module	1788 Modules @ 8 lbs each	6000	LB		$ (3,651)			/MH			$ (3,651)
			Conduit and fittings	100 @ 1 lb each	41.95	LB		$ (26)			/MH			$ (26)
			Scrap Value				***$ -***	***$ (21,172)***	***$ -***				***$ -***	***$ (21,172)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4	EA	$ 7,200				/MH			$ 7,200
			Dumpster, 40 CY Capacity	Fix point rods	1	EA	$ 900				/MH			$ 900
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 8,380***	***$ -***	***$ -***				***$ -***	***$ 8,380***
	24.00.00		**Architectural**											
		24.37.00	*Roofing*											
			Roof repair at fix points	Installation	750	EA	$ 123,750				/MH	$ -		$ 123,750
			Architectual				***$ 123,750***	***$ -***	***$ -***				***$ -***	***$ 123,750***
Direct Costs														*$ 253,899*
	61.00.00		**Construction Indirect**											
		61.99.00	*Miscellaneous*											
			Downspout / Chute		1	LS	$ 25,000				/MH			$ 25,000
			Construction Indirect				***$ 25,000***	***$ -***	***$ -***				***$ -***	***$ 25,000***
Subtotal							*$ 157,130*	*$ (21,172)*	*$ -*				*$ 142,942*	*$ 278,899*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 19,523
		91.10	Contractor's Profit											$ 27,890
														$ 47,413
Direct Costs + Construction Indirect Costs							*$ 157,130*	*$ (21,172)*	*$ -*				*$ 142,942*	*$ 326,312*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 19,579
		93.2	Construction Management Support											$ 6,526
		93.3	SDG&E Internal Costs											$ 32,631
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 23,570							$ 23,570
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 21,441	$ 21,441
		95.5	Contingency on Indirect											$ 8,810
Total							**$ 180,700**	**$ (21,172)**	**$ -**				**$ 164,383**	**$ 438,870**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplate_kW	PanelQty
28	SPS	Sony Corporation	16590 1/3 Via Del Campo, San Diego	Carport - Canop	PV	9/9/2009	136.9	867

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Canopy Mount														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Column foundations	19	/CY				114	/MH	$ 140.47	$ 16,014	$ 16,014
			Concrete	Electrical equipment (Transformer, invi	1	/CY				24	/MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*											
			Remove structural canopy		1	EA				128	/MH	$ 140.47	$ 17,980	$ 17,980
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				103	/MH	$ 127.80	$ 13,163	$ 13,163
			Demo conduit from rack to tie point		1	EA				26	/MH	$ 127.80	$ 3,323	$ 3,323
			Disconnect wiring at inverter		1	EA				26	/MH	$ 127.80	$ 3,323	$ 3,323
			Disconnect wiring at combiner boxes, remove boxes		3	EA				106	/MH	$ 127.80	$ 13,547	$ 13,547
			Pull wire from combiners to inverter		3	EA				77	/MH	$ 127.80	$ 9,841	$ 9,841
			Disconnect and remove wiring at PV panels		867	EA				161	/MH	$ 127.80	$ 20,576	$ 20,576
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		867	EA				42	/MH	$ 127.80	$ 5,368	$ 5,368
			Remove PV panel and place in dumpster		867	EA				539	/MH	$ 127.80	$ 68,884	$ 68,884
			Remove Conduits to inverters		1	EA				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Remove inverters		1	EA				13	/MH	$ 127.80	$ 1,661	$ 1,661
			Remove transformer		1	LT				51	/MH	$ 127.80	$ 6,518	$ 6,518
			Demolition				***$ -***	***$ -***	***$ -***				***$ 185,230***	***$ 185,230***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, 82 kW inverter	1.96	TN		$ (343)			/MH			$ (343)
			Steel	Service rack components	1.51	TN		$ (264)			/MH			$ (264)
			Steel	Conduit and fittings	1.61	TN		$ (282)			/MH			$ (282)
			Steel	Transformers	17.89	TN		$ (3,131)			/MH			$ (3,131)
			Steel	Roof ladder, 1@ 350 lb each	0.58	TN		$ (102)			/MH			$ (102)
			Steel	Canopy & steel	64.22	TN		$ (11,239)			/MH			$ (11,239)
		18.20.00	*Stainless Steel*											
			Stainless Steel	336 Racks, 13.61 lbs each	7.35	TN		$ (8,614)			/MH			$ (8,614)
		18.30.00	*Copper*											
			Copper	1 EA, 82 kW inverter	0.64	TN		$ (1,562)			/MH			$ (1,562)
			Copper	Wire	5.23	TN		$ (12,761)			/MH			$ (12,761)
			Copper	Transformers	8.51	TN		$ (20,764)			/MH			$ (20,764)
		18.50.00	*Aluminum*											
			PV Module	336 Modules @8 lbs each	8631	LB		$ (5,252)			/MH			$ (5,252)
			Conduit and fittings	100 @ 1 lb each	321	LB		$ (195)			/MH			$ (195)
			Scrap Value				***$ -***	***$ (64,508)***	***$ -***				***$ -***	***$ (64,508)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	10	EA	$ 18,000				/MH			$ 18,000
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	19	/CY	$ 760				/MH			$ 760
			Civil Work				***$ 18,760***	***$ -***	***$ -***				***$ -***	***$ 18,760***
Direct Costs														*$ 139,481*
	61.00.00		**Construction Indirect**											
			Construction Indirect				***$ -***	***$ -***	***$ -***				***$ -***	***$ -***
Subtotal							*$ 18,760*	*$ (64,508)*	*$ -*				*$ 185,230*	*$ 139,481*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 9,763.68
		91.10	Contractor's Profit											$ 13,948.12
														$ 23,712
Direct Costs + Construction Indirect Costs							*$ 18,760*	*$ (64,508)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 185,230*	*$ 139,481*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 8,368.87
		93.2	Construction Management Support											$ 2,789.62
		93.3	SDG&E Internal Costs											$ 13,948.12
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 2,814							$ 2,814
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 27,784	$ 27,784
		95.5	Contingency on Indirect											$ 3,766
Total							**$ 21,574**	**$ (64,508)**	**$ -**				**$ 213,014**	**$ 222,664**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
29	COP	County Operations Center Parking Structure A	5555 Overland Ave, San Diego, CA	Carport - Cano	PV	2/21/2011	358.7000122	1932

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Canopy Mount														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Column foundations	43	/CY				258	/MH	$ 140.47	$ 36,241	$ 36,241
			Concrete	Electrical equipment (Transformer, inv	1	/CY				24	/MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*											
			Remove structural canopy		1	EA				286	/MH	$ 140.47	$ 40,174	$ 40,174
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				229	/MH	$ 127.80	$ 29,266	$ 29,266
			Demo conduit from rack to tie point		1	EA				57	/MH	$ 127.80	$ 7,285	$ 7,285
			Disconnect wiring at inverter		1	EA				57	/MH	$ 127.80	$ 7,285	$ 7,285
			Disconnect wiring at combiner boxes, remove boxes		3	EA				236	/MH	$ 127.80	$ 30,161	$ 30,161
			Pull wire from combiners to inverter		3	EA				172	/MH	$ 127.80	$ 21,982	$ 21,982
			Disconnect and remove wiring at PV panels		1932	EA				358	/MH	$ 127.80	$ 45,752	$ 45,752
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		1932	EA				93	/MH	$ 127.80	$ 11,885	$ 11,885
			Remove PV panel and place in dumpster		1932	EA				1202	/MH	$ 127.80	$ 153,616	$ 153,616
			Remove Conduits to inverters		1	EA				29	/MH	$ 127.80	$ 3,706	$ 3,706
			Remove inverters		1	EA				29	/MH	$ 127.80	$ 3,706	$ 3,706
			Remove transformer		1	LT				114	/MH	$ 127.80	$ 14,569	$ 14,569
			Demolition				***$ -***	***$ -***	***$ -***				***$ 409,000***	***$ 409,000***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, 82 kW inverter	4.36	TN		$ (763)			/MH			$ (763)
			Steel	Service rack components	3.36	TN		$ (588)			/MH			$ (588)
			Steel	Conduit and fittings	3.58	TN		$ (627)			/MH			$ (627)
			Steel	Transformers	39.86	TN		$ (6,976)			/MH			$ (6,976)
			Steel	Roof ladder, 1@ 350 lb each	1.29	TN		$ (226)			/MH			$ (226)
			Steel	Canopy & steel	143.11	TN		$ (25,044)			/MH			$ (25,044)
		18.20.00	*Stainless Steel*											
			Stainless Steel	336 Racks, 13.61 lbs each	16.39	TN		$ (19,209)			/MH			$ (19,209)
		18.30.00	*Copper*											
			Copper	1 EA, 82 kW inverter	1.43	TN		$ (3,489)			/MH			$ (3,489)
			Copper	Wire	11.66	TN		$ (28,450)			/MH			$ (28,450)
			Copper	Transformers	18.96	TN		$ (46,262)			/MH			$ (46,262)
		18.50.00	*Aluminum*											
			PV Module	336 Modules @8 lbs each	19234	LB		$ (11,704)			/MH			$ (11,704)
			Conduit and fittings	100 @ 1 lb each	716	LB		$ (436)			/MH			$ (436)
			Scrap Value				***$ -***	***$ (143,774)***	***$ -***				***$ -***	***$ (143,774)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	21	EA	$ 37,800				/MH			$ 37,800
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	43	/CY	$ 1,720				/MH			$ 1,720
			Civil Work				***$ 39,520***	***$ -***	***$ -***				***$ -***	***$ 39,520***
Direct Costs														*$ 304,746*
	61.00.00		**Construction Indirect**											
			Construction Indirect				***$ -***	***$ -***	***$ -***				***$ -***	***$ -***
Subtotal							*$ 39,520*	*$ (143,774)*	*$ -*				*$ 409,000*	*$ 304,746*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 21,332.23
		91.10	Contractor's Profit											$ 30,474.61
														$ 51,807
Direct Costs + Construction Indirect Costs							*$ 39,520*	*$ (143,774)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 409,000*	*$ 304,746*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 18,284.77
		93.2	Construction Management Support											$ 6,094.92
		93.3	SDG&E Internal Costs											$ 30,474.61
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 5,928							$ 5,928
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 61,350	$ 61,350
		95.5	Contingency on Indirect											$ 8,228
Total							**$ 45,448**	**$ (143,774)**	**$ -**				**$ 470,350**	**$ 486,913**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
30	EIT	SDG&E EIC (parking)	4760 Clairemont Mesa Blvd, San Diego	Carport, Free-s	PV	1/17/2012	59.35100174	286

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Canopy Mount												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Column foundations	6 /CY				36 /MH	$ 140.47	$ 5,057	$ 5,057
			Concrete	Electrical equipment (Transformer, inv	1 /CY				24 /MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*									
			Remove structural canopy		1 EA				42 /MH	$ 140.47	$ 5,900	$ 5,900
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				34 /MH	$ 127.80	$ 4,345	$ 4,345
			Demo conduit from rack to tie point		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Disconnect wiring at inverter		1 EA				8 /MH	$ 127.80	$ 1,022	$ 1,022
			Disconnect wiring at combiner boxes, remove boxes		3 EA				35 /MH	$ 127.80	$ 4,473	$ 4,473
			Pull wire from combiners to inverter		3 EA				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Disconnect and remove wiring at PV panels		286 EA				53 /MH	$ 127.80	$ 6,773	$ 6,773
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		286 EA				14 /MH	$ 127.80	$ 1,789	$ 1,789
			Remove PV panel and place in dumpster		286 EA				178 /MH	$ 127.80	$ 22,748	$ 22,748
			Remove Conduits to inverters		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Remove inverters		1 EA				4 /MH	$ 127.80	$ 511	$ 511
			Remove transformer		1 LT				17 /MH	$ 127.80	$ 2,173	$ 2,173
			Demolition			***$ -***	***$ -***	***$ -***			***$ 62,892***	***$ 62,892***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, 82 kW inverter	0.65 TN		$ (114)		/MH			$ (114)
			Steel	Service rack components	0.5 TN		$ (88)		/MH			$ (88)
			Steel	Conduit and fittings	0.53 TN		$ (93)		/MH			$ (93)
			Steel	Transformers	5.9 TN		$ (1,033)		/MH			$ (1,033)
			Steel	Roof ladder, 1@ 350 lb each	0.19 TN		$ (33)		/MH			$ (33)
			Steel	Canopy & steel	21.19 TN		$ (3,708)		/MH			$ (3,708)
		18.20.00	*Stainless Steel*									
			Stainless Steel	336 Racks, 13.61 lbs each	2.43 TN		$ (2,848)		/MH			$ (2,848)
		18.30.00	*Copper*									
			Copper	1 EA, 82 kW inverter	0.21 TN		$ (512)		/MH			$ (512)
			Copper	Wire	1.73 TN		$ (4,221)		/MH			$ (4,221)
			Copper	Transformers	2.81 TN		$ (6,856)		/MH			$ (6,856)
		18.50.00	*Aluminum*									
			PV Module	336 Modules @8 lbs each	2847 LB		$ (1,732)		/MH			$ (1,732)
			Conduit and fittings	100 @ 1 lb each	106 LB		$ (65)		/MH			$ (65)
			Scrap Value			***$ -***	***$ (21,303)***	***$ -***			***$ -***	***$ (21,303)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	3 EA	$ 5,400			/MH			$ 5,400
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	6 /CY	$ 240			/MH			$ 240
			Civil Work			***$ 5,640***	***$ -***	***$ -***			***$ -***	***$ 5,640***
Direct Costs												*$ 47,229*
	61.00.00		**Construction Indirect**									
			Construction Indirect			***$ -***	***$ -***	***$ -***			***$ -***	***$ -***
Subtotal						*$ 5,640*	*$ (21,303)*	*$ -*			*$ 62,892*	*$ 47,229*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 3,306.04
		91.10	Contractor's Profit									$ 4,722.91
						$ -	***$ -***	***$ -***			***$ -***	***$ 8,029***
Direct Costs + Construction Indirect Costs						*$ 5,640*	*$ (21,303)*	*$ -*	*$ -*	*$ -*	*$ 62,892*	*$ 47,229*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 2,833.74
		93.2	Construction Management Support									$ 944.58
		93.3	SDG&E Internal Costs									$ 4,722.91
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 846						$ 846
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 9,434	$ 9,434
		95.5	Contingency on Indirect									$ 1,275
Total						**$ 6,486**	**$ (21,303)**	**$ -**			**$ 72,326**	**$ 75,314**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
31	SWC	Sharp Rees Stealy Wellness Center	300 Fir Street, San Diego, CA	Carport - Cano	PV	1/31/2013	74.34999847	333

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Canopy Mount														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Column foundations	7	/CY				42	/MH	$ 140.47	$ 5,900	$ 5,900
			Concrete	Electrical equipment (Transformer, inv	1	/CY				24	/MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*											
			Remove structural canopy		1	EA				49	/MH	$ 140.47	$ 6,883	$ 6,883
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				39	/MH	$ 127.80	$ 4,984	$ 4,984
			Demo conduit from rack to tie point		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect wiring at inverter		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect wiring at combiner boxes, remove boxes		3	EA				41	/MH	$ 127.80	$ 5,240	$ 5,240
			Pull wire from combiners to inverter		3	EA				30	/MH	$ 127.80	$ 3,834	$ 3,834
			Disconnect and remove wiring at PV panels		333	EA				62	/MH	$ 127.80	$ 7,924	$ 7,924
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		333	EA				16	/MH	$ 127.80	$ 2,045	$ 2,045
			Remove PV panel and place in dumpster		333	EA				207	/MH	$ 127.80	$ 26,455	$ 26,455
			Remove Conduits to inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove transformer		1	LT				20	/MH	$ 127.80	$ 2,556	$ 2,556
			Demolition				***$ -***	***$ -***	***$ -***				***$ 73,025***	***$ 73,025***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, 82 kW inverter	0.75	TN		$ (131)			/MH			$ (131)
			Steel	Service rack components	0.58	TN		$ (102)			/MH			$ (102)
			Steel	Conduit and fittings	0.62	TN		$ (109)			/MH			$ (109)
			Steel	Transformers	6.87	TN		$ (1,202)			/MH			$ (1,202)
			Steel	Roof ladder, 1@ 350 lb each	0.22	TN		$ (39)			/MH			$ (39)
			Steel	Canopy & steel	24.67	TN		$ (4,317)			/MH			$ (4,317)
		18.20.00	*Stainless Steel*											
			Stainless Steel	336 Racks, 13.61 lbs each	2.82	TN		$ (3,305)			/MH			$ (3,305)
		18.30.00	*Copper*											
			Copper	1 EA, 82 kW inverter	0.25	TN		$ (610)			/MH			$ (610)
			Copper	Wire	2.01	TN		$ (4,904)			/MH			$ (4,904)
			Copper	Transformers	3.27	TN		$ (7,979)			/MH			$ (7,979)
		18.50.00	*Aluminum*											
			PV Module	336 Modules @8 lbs each	3315	LB		$ (2,017)			/MH			$ (2,017)
			Conduit and fittings	100 @ 1 lb each	123	LB		$ (75)			/MH			$ (75)
			Scrap Value				***$ -***	***$ (24,790)***	***$ -***				***$ -***	***$ (24,790)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4	EA	$ 7,200				/MH			$ 7,200
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	7	/CY	$ 280				/MH			$ 280
			Civil Work				***$ 7,480***	***$ -***	***$ -***				***$ -***	***$ 7,480***
Direct Costs														*$ 55,716*
	61.00.00		**Construction Indirect**											
			Construction Indirect				***$ -***	***$ -***	***$ -***				***$ -***	***$ -***
Subtotal							*$ 7,480*	*$ (24,790)*	*$ -*				*$ 73,025*	*$ 55,716*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 3,900.09
		91.10	Contractor's Profit											$ 5,571.55
														$ 9,472
Direct Costs + Construction Indirect Costs							*$ 7,480*	*$ (24,790)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 73,025*	*$ 55,716*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 3,342.93
		93.2	Construction Management Support											$ 1,114.31
		93.3	SDG&E Internal Costs											$ 5,571.55
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 1,122							$ 1,122
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 10,954	$ 10,954
		95.5	Contingency on Indirect											$ 1,504
Total							**$ 8,602**	**$ (24,790)**	**$ -**				**$ 83,979**	**$ 88,796**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
32	ZOO	San Diego Zoo	2902 Park Blvd, San Diego, CA	Carport - Cano	PV/ES	4/21/2013	88.40000153	420

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Canopy Mount												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Column foundations	9 /CY				54 /MH	$ 140.47	$ 7,585	$ 7,585
			Concrete	Electrical equipment (Transformer, inv	1 /CY				24 /MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*									
			Remove structural canopy		1 EA				62 /MH	$ 140.47	$ 8,709	$ 8,709
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				50 /MH	$ 127.80	$ 6,390	$ 6,390
			Demo conduit from rack to tie point		1 EA				12 /MH	$ 127.80	$ 1,534	$ 1,534
			Disconnect wiring at inverter		1 EA				12 /MH	$ 127.80	$ 1,534	$ 1,534
			Disconnect wiring at combiner boxes, remove boxes		3 EA				51 /MH	$ 127.80	$ 6,518	$ 6,518
			Pull wire from combiners to inverter		3 EA				37 /MH	$ 127.80	$ 4,729	$ 4,729
			Disconnect and remove wiring at PV panels		420 EA				78 /MH	$ 127.80	$ 9,968	$ 9,968
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		420 EA				20 /MH	$ 127.80	$ 2,556	$ 2,556
			Remove PV panel and place in dumpster		420 EA				261 /MH	$ 127.80	$ 33,356	$ 33,356
			Remove Conduits to inverters		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Remove inverters		1 EA				6 /MH	$ 127.80	$ 767	$ 767
			Remove transformer		1 LT				25 /MH	$ 127.80	$ 3,195	$ 3,195
			Demolition			***$ -***	***$ -***	***$ -***			***$ 90,978***	***$ 90,978***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, 82 kW inverter	0.95 TN		$ (166)		/MH			$ (166)
			Steel	Service rack components	0.73 TN		$ (128)		/MH			$ (128)
			Steel	Conduit and fittings	0.78 TN		$ (137)		/MH			$ (137)
			Steel	Transformers	8.66 TN		$ (1,516)		/MH			$ (1,516)
			Steel	Roof ladder, 1@ 350 lb each	0.28 TN		$ (49)		/MH			$ (49)
			Steel	Canopy & steel	31.11 TN		$ (5,444)		/MH			$ (5,444)
		18.20.00	*Stainless Steel*									
			Stainless Steel	336 Racks, 13.61 lbs each	3.56 TN		$ (4,172)		/MH			$ (4,172)
		18.30.00	*Copper*									
			Copper	1 EA, 82 kW inverter	0.31 TN		$ (756)		/MH			$ (756)
			Copper	Wire	2.54 TN		$ (6,198)		/MH			$ (6,198)
			Copper	Transformers	4.12 TN		$ (10,053)		/MH			$ (10,053)
		18.50.00	*Aluminum*									
			PV Module	336 Modules @8 lbs each	4181 LB		$ (2,544)		/MH			$ (2,544)
			Conduit and fittings	100 @ 1 lb each	156 LB		$ (95)		/MH			$ (95)
			Scrap Value			***$ -***	***$ (31,257)***	***$ -***			***$ -***	***$ (31,257)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	5 EA	$ 9,000			/MH			$ 9,000
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	9 /CY	$ 360			/MH			$ 360
			Civil Work			***$ 9,360***	***$ -***	***$ -***			***$ -***	***$ 9,360***
Direct Costs												*$ 69,081*
	61.00.00		**Construction Indirect**									
			Construction Indirect			***$ -***	***$ -***	***$ -***			***$ -***	***$ -***
Subtotal						*$ 9,360*	*$ (31,257)*	*$ -*			*$ 90,978*	*$ 69,081*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 4,835.65
		91.10	Contractor's Profit									$ 6,908.08
												$ 11,744
Direct Costs + Construction Indirect Costs						*$ 9,360*	*$ (31,257)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 69,081*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 4,144.85
		93.2	Construction Management Support									$ 1,381.62
		93.3	SDG&E Internal Costs									$ 6,908.08
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 1,404						$ 1,404
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 13,647	$ 13,647
		95.5	Contingency on Indirect									$ 1,865
Total						**$ 10,764**	**$ (31,257)**	**$ -**			**$ 104,625**	**$ 110,175**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
33	DLP	Fast EV Suncharge/Del Lago Park N Ride	3310 Del Lago Blvd D, Escondido, CA	Carport - Cano	PV/ES	3/6/2014	13.10000038	60

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Crew Rate	Labor Cost	Total Cost
Canopy Mount												
	11.00.00		**Demolition**									
		11.22.00	*Concrete*									
			Concrete	Column foundations	1 /CY				6 /MH	$ 140.47	$ 843	$ 843
			Concrete	Electrical equipment (Transformer, inv	1 /CY				24 /MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*									
			Remove structural canopy		1 EA				9 /MH	$ 140.47	$ 1,264	$ 1,264
		11.41.00	*Electrical Equipment*									
			Disconnect wiring and components at service rack		1 EA				7 /MH	$ 127.80	$ 895	$ 895
			Demo conduit from rack to tie point		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at inverter		1 EA				2 /MH	$ 127.80	$ 256	$ 256
			Disconnect wiring at combiner boxes, remove boxes		3 EA				7 /MH	$ 127.80	$ 895	$ 895
			Pull wire from combiners to inverter		3 EA				5 /MH	$ 127.80	$ 639	$ 639
			Disconnect and remove wiring at PV panels		60 EA				11 /MH	$ 127.80	$ 1,406	$ 1,406
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		60 EA				3 /MH	$ 127.80	$ 383	$ 383
			Remove PV panel and place in dumpster		60 EA				37 /MH	$ 127.80	$ 4,729	$ 4,729
			Remove Conduits to inverters		1 EA				1 /MH	$ 127.80	$ 128	$ 128
			Remove inverters		1 EA				1 /MH	$ 127.80	$ 128	$ 128
			Remove transformer		1 LT				4 /MH	$ 127.80	$ 511	$ 511
			Demolition			***$ -***	***$ -***	***$ -***			***$ 15,702***	***$ 15,702***
	18.00.00		**Scrap Value**									
		18.10.00	*Mixed Steel*									
			Steel	1 EA, 82 kW inverter	0.14 TN		$ (25)		/MH			$ (25)
			Steel	Service rack components	0.1 TN		$ (18)		/MH			$ (18)
			Steel	Conduit and fittings	0.11 TN		$ (19)		/MH			$ (19)
			Steel	Transformers	1.24 TN		$ (217)		/MH			$ (217)
			Steel	Roof ladder, 1@ 350 lb each	0.04 TN		$ (7)		/MH			$ (7)
			Steel	Canopy & steel	4.44 TN		$ (777)		/MH			$ (777)
		18.20.00	*Stainless Steel*									
			Stainless Steel	336 Racks, 13.61 lbs each	0.51 TN		$ (598)		/MH			$ (598)
		18.30.00	*Copper*									
			Copper	1 EA, 82 kW inverter	0.04 TN		$ (98)		/MH			$ (98)
			Copper	Wire	0.36 TN		$ (878)		/MH			$ (878)
			Copper	Transformers	0.59 TN		$ (1,440)		/MH			$ (1,440)
		18.50.00	*Aluminum*									
			PV Module	336 Modules @8 lbs each	597 LB		$ (363)		/MH			$ (363)
			Conduit and fittings	100 @ 1 lb each	22 LB		$ (13)		/MH			$ (13)
			Scrap Value			***$ -***	***$ (4,452)***	***$ -***			***$ -***	***$ (4,452)***
	21.00.00		**Civil Work**									
		21.19.00	*Disposal*									
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1 EA	$ 1,800			/MH			$ 1,800
		21.20.00	*Backfill*									
			Foundation backfill, imported material fill	Backfill concrete pads	2 /CY	$ 80			/MH			$ 80
			Civil Work			***$ 1,880***	***$ -***	***$ -***			***$ -***	***$ 1,880***
Direct Costs												*$ 13,130*
	61.00.00		**Construction Indirect**									
			Construction Indirect			***$ -***	***$ -***	***$ -***			***$ -***	***$ -***
Subtotal						*$ 1,880*	*$ (4,452)*	*$ -*			*$ 15,702*	*$ 13,130*
	91.00.00		**Other Direct & Construction Indirect Costs**									
		91.09	Contractor's General and Administration Expense									$ 919.11
		91.10	Contractor's Profit									$ 1,313.01
												$ 2,232
Direct Costs + Construction Indirect Costs						*$ 1,880*	*$ (4,452)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 15,702*	*$ 13,130*
	93.00.00		**Indirect Costs**									
		93.1	Engineering, Procurement, & Project Services									$ 787.81
		93.2	Construction Management Support									$ 262.60
		93.3	SDG&E Internal Costs									$ 1,313.01
	95.00.00		**Contingency**									
		95.1	Contingency on Subcontractor			$ 282						$ 282
		95.2	Contingency on Scrap Value				$ -					$ -
		95.3	Contingency on Material					$ -				$ -
		95.4	Contingency on Labor								$ 2,355	$ 2,355
		95.5	Contingency on Indirect									$ 355
Total						**$ 2,162**	**$ (4,452)**	**$ -**			**$ 18,058**	**$ 20,717**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplat	PanelQty
34	AHL	Agua Hedionda	1580 Cannon Rd, Carlsbad, CA	Carport - Cano	PV	3/28/2014	5.300000191	24

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Canopy Mount														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Column foundations	1	/CY				6	/MH	$ 140.47	$ 843	$ 843
			Concrete	Electrical equipment (Transformer, inv	1	/CY				24	/MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*											
			Remove structural canopy		1	EA				4	/MH	$ 140.47	$ 562	$ 562
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				3	/MH	$ 127.80	$ 383	$ 383
			Demo conduit from rack to tie point		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at inverter		1	EA				1	/MH	$ 127.80	$ 128	$ 128
			Disconnect wiring at combiner boxes, remove boxes		3	EA				3	/MH	$ 127.80	$ 383	$ 383
			Pull wire from combiners to inverter		3	EA				2	/MH	$ 127.80	$ 256	$ 256
			Disconnect and remove wiring at PV panels		24	EA				4	/MH	$ 127.80	$ 511	$ 511
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		24	EA				1	/MH	$ 127.80	$ 128	$ 128
			Remove PV panel and place in dumpster		24	EA				15	/MH	$ 127.80	$ 1,917	$ 1,917
			Remove Conduits to inverters		1	EA				0	/MH	$ 127.80	$ -	$ -
			Remove inverters		1	EA				0	/MH	$ 127.80	$ -	$ -
			Remove transformer		1	LT				1	/MH	$ 127.80	$ 128	$ 128
			Demolition				***$ -***	***$ -***	***$ -***				***$ 8,738***	***$ 8,738***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, 82 kW inverter	0.05	TN		$ (9)			/MH			$ (9)
			Steel	Service rack components	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Conduit and fittings	0.04	TN		$ (7)			/MH			$ (7)
			Steel	Transformers	0.5	TN		$ (88)			/MH			$ (88)
			Steel	Roof ladder, 1@ 350 lb each	0.02	TN		$ (4)			/MH			$ (4)
			Steel	Canopy & steel	1.78	TN		$ (312)			/MH			$ (312)
		18.20.00	*Stainless Steel*											
			Stainless Steel	336 Racks, 13.61 lbs each	0.2	TN		$ (234)			/MH			$ (234)
		18.30.00	*Copper*											
			Copper	1 EA, 82 kW inverter	0.02	TN		$ (49)			/MH			$ (49)
			Copper	Wire	0.14	TN		$ (342)			/MH			$ (342)
			Copper	Transformers	0.24	TN		$ (586)			/MH			$ (586)
		18.50.00	*Aluminum*											
			PV Module	336 Modules @8 lbs each	239	LB		$ (145)			/MH			$ (145)
			Conduit and fittings	100 @ 1 lb each	9	LB		$ (5)			/MH			$ (5)
			Scrap Value				***$ -***	***$ (1,787)***	***$ -***				***$ -***	***$ (1,787)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	1	EA	$ 1,800				/MH			$ 1,800
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	1	/CY	$ 40				/MH			$ 40
			Civil Work				***$ 1,840***	***$ -***	***$ -***				***$ -***	***$ 1,840***
Direct Costs														*$ 8,791*
	61.00.00		**Construction Indirect**											
			Construction Indirect				***$ -***	***$ -***	***$ -***				***$ -***	***$ -***
Subtotal							*$ 1,840*	*$ (1,787)*	*$ -*				*$ 8,738*	*$ 8,791*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 615.39
		91.10	Contractor's Profit											$ 879.12
														$ 1,495
Direct Costs + Construction Indirect Costs							*$ 1,840*	*$ (1,787)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 8,738*	*$ 8,791*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 527.47
		93.2	Construction Management Support											$ 175.82
		93.3	SDG&E Internal Costs											$ 879.12
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 276							$ 276
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 1,311	$ 1,311
		95.5	Contingency on Indirect											$ 237
Total							**$ 2,116**	**$ (1,787)**	**$ -**				**$ 10,048**	**$ 13,692**

San Diego Gas & Electric
Decommissioning Cost Estimates
PV Sites - Canopy Mounted

ProjID	Code	Customer	Address	PV_Location	Technology	DateEnergized	FacilityNameplate_kW	PanelQty
35	CWP	Civita Westpark Apartments	7777 Westside Dr, San Diego CA	Carport	PV/ES	4/4/2016	87	352

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
Canopy Mount														
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Column foundations	8	/CY				48	/MH	$ 140.47	$ 6,743	$ 6,743
			Concrete	Electrical equipment (Transformer, inv	1	/CY				24	/MH	$ 140.47	$ 3,371	$ 3,371
		11.24.00	*Architectural*											
			Remove structural canopy		1	EA				52	/MH	$ 140.47	$ 7,304	$ 7,304
		11.41.00	*Electrical Equipment*											
			Disconnect wiring and components at service rack		1	EA				42	/MH	$ 127.80	$ 5,368	$ 5,368
			Demo conduit from rack to tie point		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect wiring at inverter		1	EA				10	/MH	$ 127.80	$ 1,278	$ 1,278
			Disconnect wiring at combiner boxes, remove boxes		3	EA				43	/MH	$ 127.80	$ 5,495	$ 5,495
			Pull wire from combiners to inverter		3	EA				31	/MH	$ 127.80	$ 3,962	$ 3,962
			Disconnect and remove wiring at PV panels		352	EA				65	/MH	$ 127.80	$ 8,307	$ 8,307
			Disconnect and remove grounding at PV panels and racks, Remove ground rods		352	EA				17	/MH	$ 127.80	$ 2,173	$ 2,173
			Remove PV panel and place in dumpster		352	EA				219	/MH	$ 127.80	$ 27,988	$ 27,988
			Remove Conduits to inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove inverters		1	EA				5	/MH	$ 127.80	$ 639	$ 639
			Remove transformer		1	LT				21	/MH	$ 127.80	$ 2,684	$ 2,684
			Demolition				***$ -***	***$ -***	***$ -***				***$ 77,229***	***$ 77,229***
	18.00.00		**Scrap Value**											
		18.10.00	*Mixed Steel*											
			Steel	1 EA, 82 kW inverter	0.8	TN		$ (140)			/MH			$ (140)
			Steel	Service rack components	0.61	TN		$ (107)			/MH			$ (107)
			Steel	Conduit and fittings	0.65	TN		$ (114)			/MH			$ (114)
			Steel	Transformers	7.26	TN		$ (1,271)			/MH			$ (1,271)
			Steel	Roof ladder, 1@ 350 lb each	0.23	TN		$ (40)			/MH			$ (40)
			Steel	Canopy & steel	26.07	TN		$ (4,562)			/MH			$ (4,562)
		18.20.00	*Stainless Steel*											
			Stainless Steel	336 Racks, 13.61 lbs each	2.99	TN		$ (3,504)			/MH			$ (3,504)
		18.30.00	*Copper*											
			Copper	1 EA, 82 kW inverter	0.26	TN		$ (634)			/MH			$ (634)
			Copper	Wire	2.13	TN		$ (5,197)			/MH			$ (5,197)
			Copper	Transformers	3.45	TN		$ (8,418)			/MH			$ (8,418)
		18.50.00	*Aluminum*											
			PV Module	336 Modules @8 lbs each	3504	LB		$ (2,132)			/MH			$ (2,132)
			Conduit and fittings	100 @ 1 lb each	130	LB		$ (79)			/MH			$ (79)
			Scrap Value				***$ -***	***$ (26,199)***	***$ -***				***$ -***	***$ (26,199)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*											
			Dumpster, 40 CY Capacity	Concrete, PV panels, rubbish (panels to recycler)	4	EA	$ 7,200				/MH			$ 7,200
		21.20.00	*Backfill*											
			Foundation backfill, imported material fill	Backfill concrete pads	8	/CY	$ 320				/MH			$ 320
			Civil Work				***$ 7,520***	***$ -***	***$ -***				***$ -***	***$ 7,520***
Direct Costs														*$ 58,550*
	61.00.00		**Construction Indirect**											
			Construction Indirect				***$ -***	***$ -***	***$ -***				***$ -***	***$ -***
Subtotal							*$ 7,520*	*$ (26,199)*	*$ -*				*$ 77,229*	*$ 58,550*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 4,098.50
		91.10	Contractor's Profit											$ 5,855.00
														$ 9,954
Direct Costs + Construction Indirect Costs							*$ 7,520*	*$ (26,199)*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 77,229*	*$ 58,550*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 3,513.00
		93.2	Construction Management Support											$ 1,171.00
		93.3	SDG&E Internal Costs											$ 5,855.00
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 1,128							$ 1,128
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ -					$ -
		95.4	Contingency on Labor										$ 11,584	$ 11,584
		95.5	Contingency on Indirect											$ 1,581
Total							**$ 8,648**	**$ (26,199)**	**$ -**				**$ 88,813**	**$ 93,336**

SL-016628.F_SDGE Decom(Ramona)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Ramona Solar Energy Plant

Prepared by Sargent & Lundy

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Sargent & Lundy is one of the oldest and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Sargent & Lundy delivers comprehensive project services—from consulting, design, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public and private sector clients in the power and energy, gas distribution, industrial, and government sectors.

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VERSION LOG

Version	Issue Date	Sections Modified
Draft v0	December 15, 2021	Initial Issue
Final	March 30, 2022	ES, 2.2, Appendix A

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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	March 30, 2022
Kevin C. Hopkins Principal Consultant & Project Manager	Date

CONTENTS

TABLES

APPENDIXES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
CEC	California Energy Commission
FERC	Federal Energy Regulatory Commission
Owner	San Diego Gas & Electric Company
PTC	PVUSA Test Conditions
PV	photovoltaic
Ramona	Ramona Solar Energy Plant
S&L	Sargent & Lundy
SDG&E	San Diego Gas & Electric Company
STC	Standard Test Conditions

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual dismantling cost estimate and average service life estimate for the Ramona Solar Energy Plant (Ramona) near San Diego, California. The work scope included a review of drawings and documents of the facility.

METHODOLOGY

The S&L methodology for developing the cost estimate consists of three elements: (i) S&L experience in developing plant demolition costs and S&L's existing database for numerous other projects; (ii) use of the unit cost factor methodology; and (iii) quotes from previous projects for similar activities. The cost estimate was developed based on the drawings, documents, and data provided by the Owner [5]. These drawings and documents were used to estimate the foundation sizes, steel quantities, solar array material quantities, and other equipment quantities. This information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for concrete removal, steel removal, cutting costs, etc. were developed from labor and material cost information. S&L also estimated the quantities of metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

CONCEPTUAL COST ESTIMATE

The summary of the cost estimate for decommissioning Ramona is shown in Table ES-1. The FERC account for the estimate is E344.1 for solar generators, as shown in Table ES-2. All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of the service life of the asset due to escalation and other factors.

Table ES-1 — Ramona Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$1,962,188**	**–**
Labor	–	$1,256,264
Subcontracts	–	$469,529
Equipment	–	$193,695
Material	–	$15,700
General Condition (Decommissioning Contractor Indirect) Costs	**$669,052**	**–**

Description	Total Cost	Subtotal
Scrap Value	**($156,059)**	**–**
Subtotal Demolition Contractor Costs	**$2,475,181**	**–**
Project Indirect Costs	**$270,000**	**–**
Engineering	–	$30,000
SDG&E Internal Costs	–	$240,000
Contingency Costs	**$435,185**	**–**
Total Demolition Costs	**$3,180,366**	**–**

Table ES-2 — Ramona Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
E344.1	Generators - Solar	$3,180,366
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	Total Project Cost	$3,180,366

1. INTRODUCTION

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual cost estimate for the Ramona Solar Energy Plant (Ramona) near San Diego, California. The work scope included a review of drawings and documents of the facility.

Sargent & Lundy has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through our work with various utilities, lending institutions, and developers over the years, Sargent & Lundy Consulting has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of our ISO 9001 certification audit. Our experience encompasses independent engineer services, including decommissioning cost estimation and average service life evaluation for both global and domestic electric power assets.

Sargent & Lundy has engineered over 958 power plant units. We have both the benefit of extensive design experience with feedback from operating plants, as well as individuals with extensive plant operations experience, to support our consulting services. S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

1.1. RAMONA SOLAR ENERGY PLANT

Ramona is located within the rural community of Ramona in San Diego County. The site is located on SDG&E land at the corner of Creelman Lane and Ashley Road, approximately one-half mile west of San Vincente Road. The solar plant utilizes 18.3 acres of land and is designed to produce power for 25 years.

Ramona consists of a total of 15,012 330-W solar photovoltaic (PV) modules, which equates to a system size of 4.95 MW_{DC} (STC), 4.41 MW_{DC} (PTC), and 4.32 MW_{AC} (CEC). Output is limited to the 4.4-MW combined inverter nameplate ratings. The PV system exports power to the utility power grid.

The 4-MW_{AC} system uses Hyundai silicon crystalline modules (Model No. HIS-S330TI) and fixed racking. The current generated by module strings is collected in several combiner boxes, then routed to the DC fuse box, inverters, and transformers. The system uses two Sunny Central 2200-US 4-MW inverters (2200 kVA for 1000 V_{DC}) and two EATON transformers (COOPER POWER SERIES 00020A65XEPA).

The solar cells are connected in series to make up a module. The modules are placed in series called module strings; the system has 18 such strings. The module strings are wired and routed underground to a collection point at the disconnect combiner box. The system has 48 SOLARBOS combiner boxes (1000 V_{DC}, 250-A disconnect switch, 18 input circuits). The combiner box collects the DC circuits from multiple module strings and combines them into one circuit that is then routed to the inverter.

The solar PV array is installed on a ground-mounted racking structure and surrounded by a perimeter fence. The PV arrays are supported on galvanized steel posts that are driven into the ground. The inverters, transformers, switchgear, and water tank are supported on concrete pad foundations. The security camera, fencing, and shade structures are supported on posts with concrete pier foundations.

For the purposes of this report, the solar system and supporting foundations, racks, solar modules, inverters, transformers, combiners, and cables will be removed at decommissioning. The fencing, security camera, duct banks (for communication and the security camera), and access roads—including all foundations—will also be completely removed upon decommissioning. The 4000-gallon water tank and pump, switchgear station, and shade structures—including all foundations—will be removed at decommissioning. Buried conduits, cables, or other buried commodities installed in support of the project may be abandoned in place at the discretion of the landowner and in accordance with agreements with the state and the federal regulating entities. Access roads or other existing facilities that are likely to be impacted or modified during the decommissioning and reclamation process will be repaired after completion of the decommissioning phase.

The quantities of materials for the main foundations and components to be removed, salvaged, or disposed are included herein. Several materials for removed components may have salvage or resale values; however, there are some components that may have no salvage or resale values at the time of decommissioning. The disposal of waste materials will be in accordance with state and federal laws in an approved, licensed solid waste facility. Solar panels may have a resale value in the market depending on usage and working condition at the time of decommissioning. Table 1-1 summarizes the main structures and components of the solar plant included in this decommissioning report:

Table 1-1 — Ramona Components to Be Decommissioned

Component	Quantity	Unit of Measure
Solar Modules	15,012	Each
Racks	1,280	Each
Steel Posts	1,324	Each
Inverter Stations with Foundations	2	Each

Component	Quantity	Unit of Measure
Transformers with Foundations	2	Each
Combiner Boxes	48	Each
Electrical Cables and Conduits (estimated)	61,780	Linear Foot
Perimeter Fencing	3,907	Linear Foot
Access Roads	3,907	Linear Foot
Gravel	1,447	Cubic Feet
Water Tank	1	Each
Switchgear	1	Each
Camera	1	Each

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate is based on deterministic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, linear feet of duct banks, equipment, etc.).

The cost estimate was developed based on drawings, documents, and data provided by the Owner. These drawings and documents were used to estimate the number of solar panels, foundation sizes, steel quantities, and other equipment quantities.

The S&L methodology for developing the cost estimate consist of three elements: (i) S&L experience in developing plant demolition cost and S&L's existing database for numerous other projects; (ii) use of the unit cost factor methodology; and (iii) quotes for previous projects for similar activities.

Cost estimates were created using the S&L cost model format and the S&L cost database. The estimates developed include both summaries and details for each type of work performed, indirect costs, and contingencies. The cost estimate database report lists costs by buildings, plant systems, and other categories.

An inventory of solar panels, equipment, concrete, duct banks, wiring, and other equipment was developed based on a review of the drawings. This information was used with unit cost factors developed by S&L based on industry data and experience. Unit cost factors for concrete removal, steel removal, cutting costs, and other tasks were developed from labor and material cost information. S&L also estimated the quantities of recoverable metals that could be recovered and sold for scrap. The estimate includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life. Solar panels were assumed to be recycled by a company such as We Recycle Solar at a cost to SDG&E of $20/panel based on a publication by the National Renewable Energy Laboratory and verbal information from We Recycle Solar

2.2. COST ESTIMATE SUMMARY

The summary of the cost estimate for decommissioning the Ramona Solar Energy Plant is shown in Table 2-1. The commercial and technical basis for the estimate is included in Section 3. The detailed estimate is included in Appendix A.

The estimate is represented by the FERC account for solar generators, as shown in Table 2-2.

All costs are in 2021 U.S. dollars. The decommissioning costs are expected to increase by the end of service life of the asset due to escalation and other factors.

Table 2-1 — Ramona Cost Estimate Summary

Description	Total Cost	Subtotal
Demolition Direct Costs	**$1,962,188**	**–**
Labor	–	$1,256,264
Subcontracts	–	$469,529
Equipment	–	$193,695
Material	–	$15,700
General Condition (Decommissioning Contractor Indirect) Costs	**$669,052**	**–**
Scrap Value	**($156,059)**	**–**
Subtotal Demolition Contractor Costs	**$2,475,181**	**–**
Project Indirect Costs	**$270,000**	**–**
Engineering	–	$30,000
SDG&E Internal Costs	–	$240,000
Contingency Costs	**$435,185**	**–**
Total Demolition Costs	**$3,180,366**	**–**

Table 2-2 — Ramona Cost Estimate Summary by FERC Account

FERC No.	Description	Total Cost
E344.1	Generators - Solar	$3,180,366
–	General Conditions	Included Above
–	Engineering	Included Above
–	Contingency	Included Above
–	Total Project Cost	$3,180,366

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for San Diego, California as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from engineering-supplied information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included for the decommissioning contractor indirect costs in the cost estimate as direct costs, as noted for the following:

   - Labor Supervision
   - Construction Management
   - Field Office Expenses
   - Safety
   - Temporary Facilities
   - Mobilization/Demobilization
   - Legal Expenses/Claims
   - Small Tools and Consumables
   - General Liability Insurance
   - Construction Equipment Mobilization/Demobilization
   - Freight on Material
   - Contractor's General and Administrative Costs
   - Contractor's Profit

5. Scrap

Scrap metals are a globally traded commodity and are part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions; as such, the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The values obtained are delivered prices to the recycler. Transportation cost to the recycler is assumed to be $30/ton, resulting in the values below:

Table 3-1 — Scrap Value

Commodity	Scrap Value ($/ton)
Carbon Steel	175
#2 Copper	6,145
#2 Insulated Copper Wire	2,440

Note: 1 ton = 2000 lbs.

6. PV Panel Recycle

At the end of their useful life, many PV panels are currently sent to landfills that may release substances harmful to the environment. SDG&E has elected to recycle the PV panels in lieu of landfill disposal. In this scenario, SDG&E will pay a company such as We Recycle Solar and other specialized recyclers to recycle the panels for $20/panel. This cost is on the low end of current pricing and is based on a publication by the National Renewable Energy Laboratory and a conversation with We Recycle Solar.

7. Project Schedule

Ramona has a 12-month construction schedule.

8. Indirect Expenses

- Engineering is included to cover preparation of the decommissioning work specification, the engineering required to place the plant in safe shutdown, and any unique engineering required during demolition.

- SDG&E internal costs are included to cover costs in support of decommissioning the facility. These costs are summarized in Table 3-2.

Table 3-2 — SDG&E Internal Costs in Support of Decommissioning

Activity	Estimated Cost
Labor to prepare the site for demolition, including drain oils, drain reagents, de-energization of the power buses, etc.	$90,000

[1] www.americanrecycler.com

Activity	Estimated Cost
Site security	$60,000
Subcontracts to remove chemicals, oils, and reagents from the site	$40,000
SDG&E project management, permitting, and procurement	$80,000
Total	**$270,000**

9. Escalation Rates

No escalation rates are included.

10. Sales and Use Taxes

Sales and use taxes are not included.

11. Contingency

- A 15% contingency is applied for material, labor, and indirect expenses.
- There is no contingency on scrap value.

12. Contract Basis for Estimate

The contracting strategy will be a multiple lump sum.

13. Assumptions

- The facility will be in safe-shutdown mode and ready for a decommissioning contractor to start work.
- All chemicals and lubricating oils will be removed from the facilities to be demolished by the utility before demolition.
- No extraordinary environmental costs for demolition will be needed.
- Switchyards within the plant boundaries are not part of the scope, nor are access roads to these facilities.
- All items above grade and to a depth of four feet will be demolished. All foundations will be removed. Any other items buried more than 4 feet deep will remain in place.
- All demolished materials are considered debris, except for organic combustibles and non-embedded metals with scrap value.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- Handling onsite and offsite disposal of hazardous materials will be performed in compliance with methods approved by SDG&E's Environmental Services Department.\
- All borrow (fill) material is assumed to be from offsite sources.

4. REFERENCES

1. Sargent & Lundy Cost Database.
2. R.S. Means Cost Data, 2021.
3. Engineering drawings, equipment lists, operations and maintenance records, and other information provided by San Diego Gas & Electric.
4. *Scrap Metals MarketWatch*, West Coast (Zone 1), www.americanrecycler.com.
5. Ramona decommissioning data provided by SDG&E in response to an information request.

APPENDIX A. CONCEPTUAL COST ESTIMATE TO DECOMMISSION RAMONA SOLAR

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	12/8/21
Reviewed By	BA
Approved By	BA
Estimate No.	35767A

SAN DIEGO GAS & ELECTRIC
RAMONA SOLAR ENERGY PLANT
DECOMMISSIONG STUDY - SORTED BY FERC ACCOUNTS

Sargent & Lundy

Area	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
E344.1	GENERATORS - SOLAR	198,175	(90,570)		8,004	1,296,551	268,082	1,672,238
E345.1	ACCESSORY ELECTRICAL EQUIPMENT	431,426	(65,488)	24,457	7,409	1,086,175	31,558	1,508,128

Estimate Totals

Description	Amount	Totals	Hours
Labor	2,382,727		15,413
Material	24,457		
Subcontract	629,601		
Construction Equipment	299,640		
Process Equipment	(156,059)		
	3,180,366	**3,180,366**	
General Conditions			
Additional Labor Costs			
Site Overheads			
Other Construction Indirects			
		3,180,366	
Project Indirect Costs			
		3,180,366	
Contingency			
		3,180,366	
Escalation			
		3,180,366	
Total		**3,180,366**	

General Condition Costs, Indirect Costs and Contingency are allocated in the line items above.

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
E344.1			GENERATORS - SOLAR									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.21.00	CIVIL WORK									
			REMOVE FENCE		3,907.00 LF	-	-		156	26,336	11,164	37,501
			CIVIL WORK						156	26,336	11,164	37,501
		10.22.00	CONCRETE									
			BUILDING/EQUIPMENT FOUNDATION/PAD	INVERTERS, SWITCHGEAR FOUNDATIONS	28.00 CY	-	-		47	7,998	1,607	9,605
			BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TANK AND PUMP PAD	13.00 CY	-	-		22	3,713	746	4,459
			BUILDING/EQUIPMENT FOUNDATION/PAD	PANEL BOARD FOUNDATIONS (8 EACH)	2.00 CY	-	-		6	1,016	204	1,220
			REMOVE CONCRETE PIER	SECURITY CAMERA POST PIER	4.00 EA	-	-		1	203	41	244
			REMOVE CONCRETE PIER	INVERTER SHADE STRUCTURE	12.00 EA	-	-		12	2,031	408	2,439
			REMOVE CONCRETE PIER	SWITCHGEAR SHADE STRUCTURE	4.00 EA	-	-		4	677	136	813
			REMOVE CONCRETE PIER	FENCE POST PIER	500.00 EA	-	-		150	25,389	5,103	30,492
			REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND MANHOLE. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	AC DUCTBANK	560.00 LF	-	-		280	47,393	9,525	56,918
			REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND PULLBOXES. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	DC DUCTBANK	2,212.00 LF	-	-		1,770	299,522	60,198	359,720
			REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND PULLBOXES. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	SITE PERIMETER DUCTBANK FOR COMMUNICATION AND SECURITY CAMERAS	2,772.00 LF	-	-		1,386	234,594	47,149	281,742
			CONCRETE						3,678	622,534	125,117	747,651
		10.23.00	STEEL									
			REMOVE AND LOAD STEEL RACKING POST		1,324.00 EA	-	-		794	128,915	20,719	149,634
			REMOVE AND LOAD STEEL	INVERTER SHADE STRUCTURES	2.00 EA	-	-		64	10,386	1,669	12,055
			REMOVE AND LOAD STEEL	SWITCHGEAR SHADE STRUCTURE	1.00 EA	-	-		32	5,193	835	6,028
			REMOVE AND LOAD SECURITY CAMERA 10 FT POLE		4.00 EA	-	-		12	1,947	313	2,260
			STEEL						902	146,441	23,536	169,978
		10.31.00	MECHANICAL EQUIPMENT									
			4,000 GAL WATER TANK AND PUMP		1.00 LT	-	-		60	9,097	2,113	11,211
			MECHANICAL EQUIPMENT						60	9,097	2,113	11,211
		10.43.00	CABLE									
			#4 1/C BARE CU WIRE IN CONDUIT	DC WIRE	20,370.00 LF	-	-		204	30,163	5,051	35,214
			#4/0 3/C CU INSLUATED WIRE IN CONDUIT	AC WIRE	610.00 LF	-	-		43	6,323	1,059	7,382
			#250 KCMIL 1/C CU INSULATED WIRE IN CONDUIT	DC WIRE	40,800.00 LF	-	-		2,040	302,070	50,588	352,658
			CABLE						2,286	338,555	56,698	395,253
			WHOLE PLANT DEMOLITION						7,083	1,142,964	218,629	1,361,594
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			STEEL	FENCING	-16.00 TN	-	(3,472)	-			-	(3,472)
			STEEL	INVERTER SHADE STRUCTURES	-1.42 TN	-	(308)	-			-	(308)
			STEEL	SWITCHGEAR SHADE STRUCTURE	-0.90 TN	-	(195)	-			-	(195)
			STEEL	WATER TANK AND PUMP	-2.00 TN	-	(434)	-			-	(434)
			MIXED STEEL				(4,409)					(4,409)
		18.30.00	COPPER									
			#2 INSULATED COPPER WIRE		-35.40 TN	-	(78,234)	-	0			(78,234)
			BARE COPPER WIRE		-1.29 TN	-	(7,927)	-	0			(7,927)
			COPPER				(86,161)		0			(86,161)
			SCRAP VALUE				(90,570)		0			(90,570)
	21.00.00		CIVIL WORK									
		21.17.00	EXCAVATION									
			EXCAVATION, 4 INCHES DEEP	GRAVEL ACCESS ROAD, 4 INCHES DEEP	1,447.00 CY	-	-		203	35,011	30,079	65,090
			EXCAVATION						203	35,011	30,079	65,090
		21.18.00	HAULING									
			HAULING, 40 MILE ROUNDTRIP, 50 MPH	ACCESS ROAD GRAVEL	1,447.00 CY	30,091	-					30,091
			HAULING			30,091						30,091
		21.19.00	DISPOSAL									
			DUMPSTER, 40 CY CAPACITY	CONCRETE, RUBBISH, PVC CONDUIT	120.00 EA	124,772	-				-	124,772
			NO DISPOSAL FEE FOR ACCESS ROAD GRAVEL. ASSUME IT IS REUSED		EA		-				-	

Area	Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
			DISPOSAL			124,772						124,772
		21.45.00	GRADING									
			FINISH GRADING	DUCTBANK TRENCHES AND ROADWAY - FILL IN AND BLEND/LEVEL INTO SURROUNDING AREA	71,851.00 SY	-	-		719	118,576	19,374	137,949
			GRADING						719	118,576	19,374	137,949
		21.47.00	LANDSCAPING									
			HYDRO SEEDING		14.80 AC	43,313	-	-		-	-	43,313
			LANDSCAPING			43,313						43,313
			CIVIL WORK			198,175			921	153,587	49,452	401,214
			E344.1 GENERATORS - SOLAR			**198,175**	**(90,570)**		**8,004**	**1,296,551**	**268,082**	**1,672,238**
E345.1			**ACCESSORY ELECTRICAL EQUIPMENT**									
	10.00.00		WHOLE PLANT DEMOLITION									
		10.41.00	ELECTRICAL EQUIPMENT									
			DISCONNECT/REMOVE FREE STANDING PANEL BOARD RACK		8.00 EA	-	-		64	9,704	2,254	11,958
			DISCONNECT/REMOVE INVERTERS		2.00 EA	-	-		48	7,278	1,691	8,969
			DISCONNECT / REMOVE "DISCONNECT COMBINER"		48.00 EA	-	-		96	14,053	275	14,328
			DISCONNECT/REMOVE DC WIRING (PANEL TO COMBINER)		15,012.00 EA	-	-		751	109,877	2,148	112,025
			DISCONNECT/REMOVE GROUNDING WIRING AT PANELS AND RACKS, REMOVE GROUND RODS		15,012.00 EA	-	-		600	87,902	1,719	89,620
			REMOVE PV PANEL FROM RACK		15,012.00 EA	-	-		1,501	219,754	4,296	224,050
			LOAD AND BAND PV PANELS ON PALLET		15,012.00 EA	-	-		300	43,951	859	44,810
			4' X 8' WOOD PALLET, HANDLE AND LOAD IN TRUCK	30 PANELS PER PALLET	500.00 EA	-	-	23,367	100	15,162	3,522	42,051
			STEEL STRAP BANDING MATERIAL COST		1.00 LT	-	-	1,090				1,090
			REMOVE "RBI" SOLAR RACKS		1,280.00 EA	-	-		3,840	562,121	10,990	573,110
			TRANSFORMERS 2200 KVA, 34.5 KV OUTPUT		2.00 EA	-	-		48	7,278	1,691	8,969
			REMOVE SWITCHGEAR AND SCADA CABINET		1.00 EA	-	-		60	9,097	2,113	11,211
			ELECTRICAL EQUIPMENT					24,457	7,409	1,086,175	31,558	1,142,191
			WHOLE PLANT DEMOLITION					24,457	7,409	1,086,175	31,558	1,142,191
	18.00.00		SCRAP VALUE									
		18.10.00	MIXED STEEL									
			STEEL	"RBI" SOLAR RACKS AND POSTS	-261.00 TN	-	(56,637)	-			-	(56,637)
			STEEL	CONDUIT, FITTINGS AND DISCONNECTS	-0.50 TN	-	(108)	-			-	(108)
			STEEL	SERVICE RACK COMPONENTS	-0.47 TN	-	(102)	-			-	(102)
			STEEL	INVERTERS	-8.82 TN	-	(1,914)	-			-	(1,914)
			STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	MEDIUM VOLTAGE BLOCK WHICH INCLUDES TRANSFORMERS 2200 KVA, 34.5 KV OUTPUT	-15.50 TN	-	(6,727)	-	0			(6,727)
			MIXED STEEL				(65,488)		0			(65,488)
			SCRAP VALUE				(65,488)		0			(65,488)
	21.00.00		CIVIL WORK									
		21.18.00	HAULING									
			HAULING, 170 MILES TO YUMA, ARIZONA	20 PALLETS / TRUCK LOAD. TRANSPORT PV PANELS TO "WE RECYCLE SOLAR" FACILITY IN YUMA, ARIZONA	25.00 EA	50,720	-					50,720
			HAULING			50,720						50,720
		21.19.00	DISPOSAL									
			PV PANEL DISPOSAL FEE.	"WE RECYCLE SOLAR" , YUMA, ARIZONA	15,012.00 EA	380,706	-				-	380,706
			DISPOSAL			380,706						380,706
			CIVIL WORK			431,426						431,426
			E345.1 ACCESSORY ELECTRICAL EQUIPMENT			**431,426**	**(65,488)**	**24,457**	**7,409**	**1,086,175**	**31,558**	**1,508,128**

Estimator	GA
Labor rate table	21CASAN
Project No.	A14520.001
Estimate Date	12/8/21
Reviewed By	BA
Approved By	BA
Estimate No.	35767A

SAN DIEGO GAS & ELECTRIC
RAMONA SOLAR ENERGY PLANT
DECOMMISSIONG STUDY

Group	Description	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00	WHOLE PLANT DEMOLITION			15,700	14,492	1,175,287	161,728	1,352,715
18.00.00	SCRAP VALUE		(156,059)		0			(156,059)
21.00.00	CIVIL WORK	496,529			921	80,977	31,967	609,473
	TOTAL DIRECT	496,529	(156,059)	15,700	15,413	1,256,264	193,695	1,806,129

Estimate Totals

Description	Amount	Totals	Hours
Labor	1,256,264		15,413
Material	15,700		
Subcontract	496,529		
Construction Equipment	193,695		
Process Equipment	(156,059)		
	1,806,129	**1,806,129**	
General Conditions			
Additional Labor Costs			
90-1 Labor Supervision	75,376		
90-2 Show-up Time	25,125		
90-3 Cost Due To OT 5-10's			
90-4 Cost Due To OT 6-10's			
90-5 Per Diem			
Site Overheads			
91-1 Construction Management	135,676		
91-2 Field Office Expenses	29,849		
91-3 Material&Quality Control			
91-4 Site Services			
91-5 Safety	13,568		
91-6 Temporary Facilities	20,392		
91-7 Temporary Utilities			
91-8 Mobilization/Demob.	21,491		
91-9 Legal Expenses/Claims	3,175		
Other Construction Indirects			
92-1 Small Tools & Consumables	13,568		
92-2 Scaffolding			
92-3 General Liability Insur.	13,568		
92-4 Constr. Equip. Mob/Demob	9,685		
92-5 Freight on Material	785		
92-6 Freight on Process Equip			
92-7 Sales Tax			
92-8 Contractors G&A	126,327		
92-9 Contractors Profit	180,467		
	669,052	**2,475,181**	
Project Indirect Costs			
93-1 Engineering Services	30,000		
93-2 CM Support			
93-3 Start-Up/Commissioning			
93-4 Start-Up/Spare Parts			
93-5 Excess Liability Insur.			
93-6 Sales Tax On Indirects			
93-7 SDG&E Internal Costs	240,000		
93-8 EPC Fee			
	270,000	**2,745,181**	
Contingency			
94-1 Contingency on Const Eq	35,446		
94-3 Contingency on Material	2,893		
94-4 Contingency on Labor	281,867		
94-5 Contingency on Subcontr.	74,479		
94-6 Contingency on Process Eq			
94-7 Contingency on Indirect	40,500		
	435,185	**3,180,366**	
Escalation			
96-1 Escalation on Const Equip			
96-3 Escalation on Material			
96-4 Escalation on Labor			
96-5 Escalation on Subcontract			
96-6 Escalation on Process Eqp			
96-7 Escalation on Indirects			
		3,180,366	
98 Interest During Constr			
		3,180,366	
Total		**3,180,366**	

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
10.00.00		**WHOLE PLANT DEMOLITION**									
	10.21.00	**CIVIL WORK**									
		REMOVE FENCE		3,907.00 LF	-	-		156	13,885	7,217	21,102
		CIVIL WORK						**156**	**13,885**	**7,217**	**21,102**
	10.22.00	**CONCRETE**									
		BUILDING/EQUIPMENT FOUNDATION/PAD	INVERTERS, SWITCHGEAR FOUNDATIONS	28.00 CY	-	-		47	4,217	1,039	5,256
		BUILDING/EQUIPMENT FOUNDATION/PAD	WATER TANK AND PUMP PAD	13.00 CY	-	-		22	1,958	482	2,440
		BUILDING/EQUIPMENT FOUNDATION/PAD	PANEL BOARD FOUNDATIONS (8 EACH)	2.00 CY	-	-		6	535	132	667
		REMOVE CONCRETE PIER	SECURITY CAMERA POST PIER	4.00 EA	-	-		1	107	26	133
		REMOVE CONCRETE PIER	INVERTER SHADE STRUCTURE	12.00 EA	-	-		12	1,071	264	1,335
		REMOVE CONCRETE PIER	SWITCHGEAR SHADE STRUCTURE	4.00 EA	-	-		4	357	88	445
		REMOVE CONCRETE PIER	FENCE POST PIER	500.00 EA	-	-		150	13,386	3,299	16,685
		REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND MANHOLE. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	AC DUCTBANK	560.00 LF	-	-		280	24,987	6,157	31,144
		REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND PULLBOXES. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	DC DUCTBANK	2,212.00 LF	-	-		1,770	157,919	38,914	196,833
		REMOVE AND LOADOUT CONCRETE DUCTBANK INCLUDING EMBEDDED PVC CONDUIT AND PULLBOXES. EXCAVATE AND BACKFILL WITH NATIVE SOIL INCLUDED.	SITE PERIMETER DUCTBANK FOR COMMUNICATION AND SECURITY CAMERAS	2,772.00 LF	-	-		1,386	123,687	30,478	154,165
		CONCRETE						**3,678**	**328,224**	**80,879**	**409,103**
	10.23.00	**STEEL**									
		REMOVE AND LOAD STEEL RACKING POST		1,324.00 EA	-	-		794	67,969	13,394	81,362
		REMOVE AND LOAD STEEL	INVERTER SHADE STRUCTURES	2.00 EA	-	-		64	5,476	1,079	6,555
		REMOVE AND LOAD STEEL	SWITCHGEAR SHADE STRUCTURE	1.00 EA	-	-		32	2,738	540	3,277
		REMOVE AND LOAD SECURITY CAMERA 10 FT POLE		4.00 EA	-	-		12	1,027	202	1,229
		STEEL						**902**	**77,209**	**15,214**	**92,424**
	10.31.00	**MECHANICAL EQUIPMENT**									
		4,000 GAL WATER TANK AND PUMP		1.00 LT	-	-		60	4,796	1,366	6,163
		MECHANICAL EQUIPMENT						**60**	**4,796**	**1,366**	**6,163**
	10.41.00	**ELECTRICAL EQUIPMENT**									
		DISCONNECT/REMOVE FREE STANDING PANEL BOARD RACK		8.00 EA	-	-		64	5,116	1,457	6,573
		DISCONNECT/REMOVE INVERTERS		2.00 EA	-	-		48	3,837	1,093	4,930
		DISCONNECT / REMOVE "DISCONNECT COMBINER"		48.00 EA	-	-		96	7,409	178	7,587
		DISCONNECT/REMOVE DC WIRING (PANEL TO COMBINER)		15,012.00 EA	-	-		751	57,931	1,389	59,320
		DISCONNECT/REMOVE GROUNDING WIRING AT PANELS AND RACKS, REMOVE GROUND RODS		15,012.00 EA	-	-		600	46,345	1,111	47,456
		REMOVE PV PANEL FROM RACK		15,012.00 EA	-	-		1,501	115,863	2,777	118,640
		LOAD AND BAND PV PANELS ON PALLET		15,012.00 EA	-	-		300	23,173	555	23,728
		4' X 8' WOOD PALLET, HANDLE AND LOAD IN TRUCK	30 PANELS PER PALLET	500.00 EA	-	-	15,000	100	7,994	2,277	25,271
		STEEL STRAP BANDING MATERIAL COST		1.00 LT	-	-	700				700
		REMOVE "RBI" SOLAR RACKS		1,280.00 EA	-	-		3,840	296,371	7,104	303,475
		TRANSFORMERS 2200 KVA, 34.5 KV OUTPUT		2.00 EA	-	-		48	3,837	1,093	4,930
		REMOVE SWITCHGEAR AND SCADA CABINET		1.00 EA	-	-		60	4,796	1,366	6,163
		ELECTRICAL EQUIPMENT					**15,700**	**7,409**	**572,673**	**20,400**	**608,773**
	10.43.00	**CABLE**									
		#4 1/C BARE CU WIRE IN CONDUIT	DC WIRE	20,370.00 LF	-	-		204	15,903	3,265	19,168
		#4/0 3/C CU INSLUATED WIRE IN CONDUIT	AC WIRE	610.00 LF	-	-		43	3,334	684	4,018
		#250 KCMIL 1/C CU INSULATED WIRE IN CONDUIT	DC WIRE	40,800.00 LF	-	-		2,040	159,263	32,701	191,964
		CABLE						**2,286**	**178,499**	**36,651**	**215,150**
		WHOLE PLANT DEMOLITION					**15,700**	**14,492**	**1,175,287**	**161,728**	**1,352,715**
18.00.00		**SCRAP VALUE**									
	18.10.00	**MIXED STEEL**									

Group	Phase	Description	Notes	Quantity	Subcontract Cost	Scrap Value	Material Cost	Man Hours	Labor Cost	Equip Amount	Total Cost
	18.10.00	MIXED STEEL									
		STEEL	"RBI" SOLAR RACKS AND POSTS	-261.00 TN	-	(56,637)	-			-	(56,637)
		STEEL	CONDUIT, FITTINGS AND DISCONNECTS	-0.50 TN	-	(108)	-			-	(108)
		STEEL	SERVICE RACK COMPONENTS	-0.47 TN	-	(102)	-			-	(102)
		STEEL	FENCING	-16.00 TN	-	(3,472)	-			-	(3,472)
		STEEL	INVERTER SHADE STRUCTURES	-1.42 TN	-	(308)	-			-	(308)
		STEEL	SWITCHGEAR SHADE STRUCTURE	-0.90 TN	-	(195)	-			-	(195)
		STEEL	WATER TANK AND PUMP	-2.00 TN	-	(434)	-			-	(434)
		STEEL	INVERTERS	-8.82 TN	-	(1,914)	-			-	(1,914)
		STEEL / COPPER MIX - LARGE TRANSFORMER > 100 KVA	MEDIUM VOLTAGE BLOCK WHICH INCLUDES TRANSFORMERS 2200 KVA, 34.5 KV OUTPUT	-15.50 TN	-	(6,727)	-	0			(6,727)
		MIXED STEEL				(69,898)		0			(69,898)
	18.30.00	COPPER									
		#2 INSULATED COPPER WIRE		-35.40 TN	-	(78,234)	-	0			(78,234)
		BARE COPPER WIRE		-1.29 TN	-	(7,927)	-	0			(7,927)
		COPPER				(86,161)		0			(86,161)
		SCRAP VALUE				**(156,059)**		**0**			**(156,059)**
21.00.00		**CIVIL WORK**									
	21.17.00	EXCAVATION									
		EXCAVATION, 4 INCHES DEEP	GRAVEL ACCESS ROAD, 4 INCHES DEEP	1,447.00 CY	-	-		203	18,459	19,444	37,903
		EXCAVATION						203	18,459	19,444	37,903
	21.18.00	HAULING									
		HAULING, 40 MILE ROUNDTRIP, 50 MPH	ACCESS ROAD GRAVEL	1,447.00 CY	23,731	-					23,731
		HAULING, 170 MILES TO YUMA, ARIZONA	20 PALLETS / TRUCK LOAD. TRANSPORT PV PANELS TO "WE RECYCLE SOLAR" FACILITY IN YUMA, ARIZONA	25.00 EA	40,000	-					40,000
		HAULING			63,731						63,731
	21.19.00	DISPOSAL									
		DUMPSTER, 40 CY CAPACITY	CONCRETE, RUBBISH, PVC CONDUIT	120.00 EA	98,400	-				-	98,400
		NO DISPOSAL FEE FOR ACCESS ROAD GRAVEL. ASSUME IT IS REUSED		EA		-				-	
		PV PANEL DISPOSAL FEE.	"WE RECYCLE SOLAR" , YUMA, ARIZONA	15,012.00 EA	300,240	-				-	300,240
		DISPOSAL			398,640						398,640
	21.45.00	GRADING									
		FINISH GRADING	DUCTBANK TRENCHES AND ROADWAY - FILL IN AND BLEND/LEVEL INTO SURROUNDING AREA	71,851.00 SY	-	-		719	62,518	12,524	75,041
		GRADING						719	62,518	12,524	75,041
	21.47.00	LANDSCAPING									
		HYDRO SEEDING		14.80 AC	34,158	-	-		-	-	34,158
		LANDSCAPING			34,158						34,158
		CIVIL WORK			**496,529**			**921**	**80,977**	**31,967**	**609,473**

SL-016628.G_SDGE Decom(EV)

Decommissioning Study

Prepared for

San Diego Gas & Electric Company

Electric Vehicle (EV) Charging Stations

Prepared by Sargent & Lundy

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VERSION LOG

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Final	March 30, 2021	N/A

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
EV	Electric vehicle
FERC	Federal Energy Regulatory Commission
GE	General Electric
Owner	San Diego Gas & Electric Company
S&L	Sargent & Lundy LLC
SDG&E	San Diego Gas & Electric Company

EXECUTIVE SUMMARY

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform an independent conceptual decommissioning cost estimate for the SDG&E portfolio of electric vehicle (EV) charging stations. SDG&E indicated that the cost estimate should assume that all the charging stations are pedestal-mounted and are one of the three typical models found in SDG&E's portfolio of charging stations: General Electric (GE) WattStation, Clipper Creek, or ChargePoint. The charging stations are located throughout the SDG&E service area. The work scope included updating the 2016 conceptual demolition cost estimate and report.

METHODOLOGY

The methodology for developing the cost estimate consisted of S&L experience in developing demolition costs, the existing S&L database from numerous other projects, and use of the unit cost factor methodology. The cost estimate was developed based on information provided by SDG&E and publicly available information about the EV charging stations. This information was used to estimate the foundation sizes, quantity of steel, and other components. S&L performed a site walkdown at the SDG&E headquarters to review typical charging stations. The site walkdown was performed in 2016; however, recent discussions with the Owner and facility management confirmed that the only significant change since that time is a large increase in the number of installed stations. This information was used with cost factors developed by S&L based on industry data and experience.

S&L also estimated the quantities of metals that could be recovered and sold for scrap. The estimate herein includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

CONCEPTUAL COST ESTIMATE

The estimate assumes that EV charging stations are decommissioned in batches of 25 stations at a time. The total number of stations is 2463. The summary of the cost estimate for decommissioning the SDG&E EV charging stations is shown in Table ES-1. The FERC account for these costs is E371.1 according to guidance SDG&E received from FERC. All costs are in 2021 U.S. dollars. Decommissioning costs are expected to increase by the end of service life due to escalation.

Table ES-1 — Cost Estimate Summary for EV Charging Stations

	Includes Contingency							
	Subcontract Cost	*Material Cost*	*Labor Cost*	*Subcontractor Indirect Cost*	*SDG&E Internal Costs*	*Scrap Value*	*G&A and Profit*	*Total Cost*
Number of EV Charging Stations Decommissioned at a Time: 25	*$ 1,035*	*$ 4,157*	*$ 87,353*	*$ 8,531*	*$ 10,664*	*$ (1,217)*	*$ 13,474*	*$ 123,997*
Current Number of EV Charging Stations in the SDG&E Portfolio: 2463	**$ 101,968**	**$ 409,572**	**$ 8,606,025**	**$ 840,497**	**$ 1,050,624**	**$(119,899)**	**$ 1,327,431**	**$ 12,216,219**

The total estimated cost to decommission the 2463 existing EV charging stations is $12,216,219; therefore, the average or blended cost is approximately $4,960 per unit. The actual decommission cost will vary with respect to the type of EV charging station, type of foundation, number of units at a single location, and other factors listed in the cost estimate.

1. INTRODUCTION

1.1. SCOPE OF WORK

Sargent & Lundy (S&L) was contracted by San Diego Gas & Electric Company ("SDG&E" or the "Owner") to perform a conceptual decommissioning cost estimate for the SDG&E portfolio of electric vehicle (EV) charging stations. The work scope included updating the 2016 conceptual demolition cost estimate report. SDG&E indicated that the cost estimate should assume that all the charging stations are pedestal-mounted and are one of the three typical models found in SDG&E's portfolio of charging stations: General Electric (GE) WattStation, Clipper Creek, or ChargePoint. The charging stations are located throughout the SDG&E service area.

1.2. SARGENT & LUNDY BACKGROUND

S&L has been dedicated to providing complete engineering and environmental services exclusively to the power industry since 1891. Through work with various utilities, lending institutions, and developers over the years, the Sargent & Lundy Consulting Group has become one of the premier power project consultants in the power industry. This commitment to quality is proven by the successful completion of the ISO 9001 certification audit. S&L's experience encompasses independent engineer services—including decommissioning cost estimation and average service life evaluation—for both global and domestic electric power assets.

S&L has extensive decommissioning and related services experience, including power plant dismantling, demolition, and layup for fossil fuel, renewable energy, and nuclear plants. This includes decommissioning cost estimates, decommissioning studies, and related services for 18 clients at more than 70 stations. S&L also has extensive experience providing clients with testimony services.

Having engineered over 958 power plant units, S&L has both the benefit of extensive design experience—supported with feedback from operating plants—and individuals with extensive plant operations experience to support consulting services such as those performed for SDG&E's EV fleet.

1.3. EV CHARGING STATION DESCRIPTIONS

EVs were first widely introduced in the United States in the early 1900s (4% of the 4192 cars manufactured at that time were electric). This was short-lived with the rise and consequent mass production of gasoline-powered cars; however, EVs are now becoming more prevalent. Several car manufacturers have increased EV production over the past few years. This development has resulted in growth in the number of EV charging stations, which has already reached approximately one million public and six million private units globally.

EV charging stations supply and meter electric power to individual EVs. The main components of an EV charging stations are noted below:

- **Power Source:** The power source supplies the electricity needed for the charging station.
- **Charging Device:** Inside the charging station is a charging device responsible for converting and transferring the electricity from the power source to the EV. Some systems include electronics that integrate payment systems with the metering of power. The charging device can be standing (i.e., a pedestal) or wall-mounted.
- **Cabling and Plugs:** Cablings and plugs connect EVs to charging stations. Charging stations that swap banks of batteries or charge wirelessly are not widespread and are not part of the SDG&E portfolio.
- **Controls**: Controls include the electric equipment and software necessary to control, monitor, and optimize the flow of electricity to rapidly charge/recharge EVs.

SDG&E's portfolio is comprised of 2463 EV charging stations. There are three main pedestal chargers:

- **GE WattStation Pedestal**: These charging stations are manufactured by GE and come with retractable cords. It includes "advanced network management" software tools to help the user monitor and manage the charging station remotely. The GE WattStation comes with a three-year parts warranty. Its standby power is typically 5 W, while its alternating current charging power output is 7200 W. The stand is powder-coated stainless steel. In 2017, the GE charging network was acquired by ChargePoint, whose chargers are also utilized by SDG&E. The 2017 announcement stated that the warranties would continue to be honored.

Figure 1-1 — Example GE WattStation EV Charging Station

- **ClipperCreek Pedestal**: These charging stations are manufactured by ClipperCreek in the United States. They feature a slim profile with a powder-coated stainless steel enclosure for environmental durability. ClipperCreek pedestal charging stations come with a three-year parts warranty.

Figure 1-2 — Example Clipper Creek EV Charging Station

- **ChargePoint Pedestal**: ChargePoint pedestal stations come with extended parts and labor warranty coverage for up to five additional years. Its standby power is typically 8 W, while its alternating current charging power output is up to 7200 W.

Figure 1-3 — Example ChargePoint EV Charging Station

2. COST ESTIMATE

2.1. METHODOLOGY

The methodology used for developing the cost estimate includes a combination of stochastic and deterministic methods. Deterministic methods were used based on the quantity and size of equipment (e.g., the number of foundations, equipment, etc.). Stochastic methods were also used if quantitative information (e.g., miscellaneous electrical equipment) was unavailable.

The cost estimate was developed based on drawings, documents, and data provided by the Owner and publicly available information. These drawings and documents were used to estimate the foundation sizes, unit volumes, equipment, and metal quantities.

The methodology for developing the cost estimate considered S&L's experience in developing demolition costs, the existing S&L database for numerous other projects, and the use of the unit cost factor methodology. The estimate was created using the S&L cost model format and the S&L cost database. The estimate includes details for each type of work performed, indirect costs, and contingencies.

S&L visited representative charging stations at the SDG&E headquarters in 2016 to review typical charging stations and determine any unique site-specific requirements. Recent discussions with the Owner and facility management confirmed that no significant modifications have occurred since that time other than a large increase in installed stations. This information was used with cost factors developed by S&L based on industry data and experience. Cost factors for concrete removal and other tasks were developed from labor and material cost information.

S&L also estimated the quantities of metals that could be recovered and sold for scrap. The estimate herein includes the value of scrap metals; however, equipment is assumed to have no resale or other salvage value besides the value of scrap metal at the end of its life.

2.2. COST ESTIMATE SUMMARY

2.2.1. EV Charging Stations

The estimate assumes that EV charging stations are decommissioned by 25 stations at a time. The total number of stations is 2463. The summary of the cost estimate for decommissioning the SDG&E EV stations is shown in Table 2-1. The FERC account for these costs is E371.1 according to guidance SDG&E received from FERC. All costs are in 2021 U.S. dollars. Decommissioning costs are expected to increase by the end of service life due to escalation.

The commercial and technical basis for the estimate is included in Section 2. The detailed estimate is included in Appendix A.

Table 2-1 — Cost Estimate Summary for Electric Vehicle Charging Stations

	Includes Contingency							
	Subcontract Cost	*Material Cost*	*Labor Cost*	*Subcontractor Indirect Cost*	*SDG&E Internal Costs*	*Scrap Value*	*G&A and Profit*	*Total Cost*
Number of EV Charging Stations Decommissioned at a Time: 25	*$ 1,035*	*$ 4,157*	*$ 87,353*	*$ 8,531*	*$ 10,664*	*$ (1,217)*	*$ 13,474*	*$ 123,997*
Current Number of EV Charging Stations in the SDG&E Portfolio: 2463	**$ 101,968**	**$ 409,572**	**$ 8,606,025**	**$ 840,497**	**$ 1,050,624**	**$(119,899)**	**$ 1,327,431**	**$ 12,216,219**

The total cost to decommission the 2463 existing EV charging stations is estimated to be $12,216,219; therefore, the average or blended cost is approximately $4,960 per unit. The actual decommission cost will vary with respect to the type of EV charging station, type of foundation, number of units at a single location, and other factors listed in the cost estimate.

2.2.2. Variance from 2016 Study

The following list summarizes the changes from the S&L 2016 report. Note that material quantities and labor hours in the estimate were unchanged from 2016 (per 25 charging stations).

- The number of charging stations increased tenfold. In 2016, there were 206 stations compared to 2463 in 2021.
- The current estimate utilizes updated labor rates, material costs, and scrap value to current 2021 values.
- The depth of foundation to be removed was revised from 3 feet to 1 foot.
- The contractor general and administrative costs and profit were increased from 5% and 8%, respectively, to 7% and 10% based on the S&L database.
- SDG&E internal costs were added to the estimate. These were excluded from the 2016 estimate. The internal costs include disconnecting the units from the grid and securing and managing the contractor.

3. BASIS OF ESTIMATE

The basis for the cost estimate is as follows:

The decommissioning cost estimates in Section 2 and Appendix A are for the dismantlement and removal of 2463 pedestal-type, EV charging stations. SDG&E indicated that all charging stations are assumed to be the pedestal type, of which there are three models: GE WattStation, ClipperCreek, and ChargePoint.

The cost estimate is based primarily on data provided by SDG&E and S&L's experience with similar equipment.

3.1. PROCEDURE

In general, the methodology to decommission an EV charging station fixed to existing pavement or concrete considers the following:

- The charging station will be de-energized and disconnected by SDG&E.
- The charging station pedestal will be unbolted or otherwise removed from the base.
- The in-ground conduit and cable will be cut, capped, and abandoned in place.
- Internal electronics, cables, conduits, wires, controls, and other related items will be separated from the station metal pedestal and disposed.
- The pedestal will be demolished for stainless steel recycling.
- Bolts or other connections left in existing pavement or concrete will be cut and removed.
- Damage to existing pavement or concrete will be repaired using appropriate patch repair material.
- Any bollards will be completely cut out, removed from the site, and disposed.
- Holes left from bollard removal will be filled with concrete.

In general, the procedure to decommission an EV charging station fixed to a free-standing foundation is as follows:

- The charging station will be de-energized and disconnected by SDG&E.
- The charging station pedestal will be unbolted or otherwise removed from the base.
- The concrete foundation will be removed down to one foot.
- The in-ground conduit and cable will be cut, capped, and abandoned in place.
- Internal electronics, cables, conduits, wires, controls, and other related items will be separated from the station metal pedestal and disposed.
- The pedestal will be demolished for stainless steel recycling.

- Any bollards will be completely cut out, removed from the site, and disposed.
- Holes left from bollard removal will be filled with concrete.

3.2. PRICING AND QUANTITIES

1. **Construction Labor Wages**

   Craft labor rates (or craft hourly rates) for the cost estimate are based on the prevailing wages for San Diego, California as published in *R.S. Means Labor Rates for the Construction Industry* (2021). These prevailing rates are representative of union or non-union rates, whichever is prevailing in the area. Costs have been added to cover social security, workmen's compensation, and federal and state unemployment insurance. The resulting burdened craft rates were then used to develop typical crew rates applicable to the task being performed.

2. **Labor Work Schedule and Incentives**

   - The labor estimate is based on a 40-hour workweek with no per diem or other labor incentives.
   - An allowance for show-up time is included if workers arrive and are then sent home.

3. **Quantity Sources**

   Quantities of pieces of equipment and/or bulk material commodities used in this cost estimate were developed from supplied engineering information from the sites and the S&L database.

4. **General Conditions Cost**

   Allowances were included in the cost estimate for the decommissioning contractor indirect costs for the following:

   - Labor supervision and safety
   - Small tools and consumables
   - General liability insurance
   - Contractor general and administrative costs (7% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)
   - Contractor's profit (10% of labor [direct labor, additional labor cost, site overheads, and other construction indirect cost], material [direct material cost and freight cost], and equipment)

5. **Scrap**

   Scrap metals are a globally traded commodity and part of the larger metals industry. The value of scrap metal is subject to constantly changing economic conditions, as such the price of mixed steel, stainless steel, copper, and aluminum can vary greatly over time as a result of global supply and demand. Stainless steel is assumed to be the only scrap metal from the charging stations worth salvaging.

The value of scrap for this study was determined by a 12-month average from *Scrap Metals MarketWatch*[1] (November 2020–October 2021) for the West Coast (Zone 1) of the United States. The value obtained is the delivered price to the recycler. Transportation cost to the recycler is estimated at $30/ton (2000 lbs.), resulting in a stainless steel scrap value of $1217/ton.

6. **Indirect Expenses**

   - Engineering is included to cover preparation of the decommissioning work specification, engineering required to place the charging stations in safe shutdown, and any unique engineering required during demolition.
   - SDG&E internal costs are included to cover costs in support of decommissioning the stations such as disconnecting the units from the grid and securing and managing the contractor.

7. **Escalation Rates**

   Escalation rates were excluded from the estimate.

8. **Sales and Use Taxes**

   Sales and use taxes were excluded from the estimate.

9. **Contingency**

   - A 15% contingency is applied for material, labor, and indirect expenses.
   - There is no contingency on scrap value.

10. **Contract Basis for Estimate**

    The contracting strategy is a multiple lump sum for the estimate.

11. **Assumptions**

    - The cost estimate is based on 25 EV charging stations being decommissioned at a time.
    - All stations are pedestal-mounted type, as was assumed per SDG&E in 2016.
    - Most EV charging stations are in series of 2–10 pedestals in parking lots and garages. Some individual pedestals have two protective bollards while others have none or are protected by curbs; consequently, to account for the removal of bollards, one bollard for each pedestal is included with the estimate.
    - SDG&E has indicated that conduits in rights of way to pedestals will be abandoned in place.
    - Underground facilities, such as conduits, will be included through other accounts per SDG&E. These are not included in this decommissioning cost estimate.
    - Pedestal foundations and bollards shall be removed to three feet below grade.
    - Bollard weight and dimensions are for a typical unit and are based on a manufacturer drawing (1700 lbs.; 2-ft diameter by 3-ft height and 7.5-in. diameter by 4.33 ft; 10.75 ft^3 of concrete per bollard).[2]

[1] www.americanrecycler.com
[2] "Vaughn Concrete Products," www.vaughnconcreteproducts.com/bollards

- Based on observations during the site visit, a review of charging station installation manuals, and street views of SDG&E stations on Google Maps, the EV charging station were found to be installed on sidewalks, pavement, curbs, and other structures. Some stations were fixed to freestanding foundations surrounded by soil. Half of the pedestals are assumed to be fixed to 2-ft x 2-ft x 3-ft deep foundations, and the remaining half are assumed to be fixed to existing concrete or pavement.
- The estimate considers that freestanding pedestal foundations will be removed, demolished for scrap, and backfilled (with a volume of 12 ft^3 per foundation).
- All borrow (fill) material is assumed to be from offsite sources.
- The estimate assumes that the process of removing bolts from existing concrete will result in some damage to existing surfaces. A material allowance of 5 yd^3 of concrete repair per station is assumed for the project.
- The pedestal weight is based on the GE WattStation. The weight of salvageable stainless steel is estimated to be 80 lbs. based on GE specifications. This weight is typical for pedestal-type EV charging stations.
- The amount of mixed steel, aluminum, copper, and other valuable metals is considered too small to salvage. All demolished materials are considered debris except for stainless steel.
- The basis for salvage estimating is for scrap value only. No resale of equipment or material is included.
- No extraordinary environmental costs for demolition will be needed.

4. REFERENCES

12. Sargent & Lundy Cost Database.
13. RSMeans Cost Data, 2021.
14. Engineering drawings, equipment lists, operations and maintenance records, and other information provided by San Diego Gas & Electric.
15. *Scrap Metals MarketWatch* – West Coast (Zone 1), www.americanrecycler.com.
16. Bollard Dimensions – Vaugh Concrete Products, www.vaughnconcreteproducts.com/bollards.

APPENDIX A. CONCEPTUAL ESTIMATE OF COST TO DECOMMISSION EV CHARGING STATIONS

San Diego Gas & Electric
Decommissioning Cost Estimates
Electric Vehicle Charging Stations

Total Number of EV Charging Stations	2463
Number of EV Charging Stations Decommissioned at one time	25

Area	Group	Phase	Description	Notes	Quantity		Subcontract Cost	Scrap Value	Material Cost	Man Hours		Crew Rate	Labor Cost	Total Cost
	11.00.00		**Demolition**											
		11.22.00	*Concrete*											
			Concrete	Foundations 2'x2'x1'	2.0	CY				103	/MH	$ 140.47	$ 14,448	$ 14,448
			Concrete	Protective Bollards, 103 @ 0.39 cu yd each	5.0	CY				257	/MH	$ 140.47	$ 36,121	$ 36,121
		11.41.00	*Electrical Equipment*											
			Remove pedestal from base		25	EA				50	/MH	$ 127.80	$ 6,390	$ 6,390
			Remove control units, conduit, wiring, other electronics, etc.		25	EA				125	/MH	$ 127.80	$ 15,975	$ 15,975
			Demolition				***$ -***	***$ -***	***$ -***				***$ 72,934***	***$ 72,934***
	18.00.00		**Scrap Value**											
		18.20.00	*Stainless Steel*											
			Stainless Steel	Pedestals @ 80 lbs. each	1	TN		$ (1,217)			/MH			$ (1,217)
			Scrap Value				***$ -***	***$ (1,217)***	***$ -***				***$ -***	***$ (1,217)***
	21.00.00		**Civil Work**											
		21.19.00	*Disposal*		7.0	CY								
			Dumpster, 40 CY Capacity	For concrete, electronics, rubbish	1	EA	$ 900				/MH			$ 900
		21.20.00	Backfill											
			Foundation backfill, imported material fill		1.0	CY			$ 40					$ 40
			Civil Work				***$ 900***	***$ -***	***$ 40***				***$ -***	***$ 940***
	24.00.00		**Architectural**											
			Concrete											
			Repair of concrete from removed pedestal base.		5.0	CY			$ 2,750	5.0	CY	$ 275.00	$ 1,375	$ 4,125
			Foundation backfill, pedestals on concrete/asphalt surfaces		1.0	CY			$ 138	1.0	CY	$ 275.00	$ 275	$ 413
			Foundation backfill, bollards	Installation	5.0	CY			$ 688	5.0	CY	$ 275.00	$ 1,375	$ 2,063
			Architectual				***$ -***	***$ -***	***$ 3,575***				***$ 3,025***	***$ 6,600***
Subtotal							*$ 900*	*$ (1,217)*	*$ 3,615*				*$ 75,959*	*$ 79,257*
	91.00.00		**Other Direct & Construction Indirect Costs**											
		91.09	Contractor's General and Administration Expense											$ 5,548
		91.10	Contractor's Profit											$ 7,926
														$ 13,474
Direct Costs + Construction Indirect Costs							*$ 900*	*$ (1,217)*	*$ 3,615*				*$ 75,959*	*$ 92,731*
	93.00.00		**Indirect Costs**											
		93.1	Engineering, Procurement, & Project Services											$ 5,564
		93.2	Construction Management Support											$ 1,855
		93.3	SDG&E Internal Costs											$ 9,273
	95.00.00		**Contingency**											
		95.1	Contingency on Subcontractor				$ 135							$ 135
		95.2	Contingency on Scrap Value					$ -						$ -
		95.3	Contingency on Material						$ 542					$ 542
		95.4	Contingency on Labor										$ 11,394	$ 11,394
		95.5	Contingency on Indirect											$ 2,504
Subtotal for		***25***	***EV Charging Stations***				***$ 1,035***	***$ (1,217)***	***$ 4,157***				***$ 87,353***	***$ 123,997***
Total for		**2463**	**EV Charging Stations**				**$ 101,968**	**$ (119,899)**	**$ 409,572**				**$ 8,606,025**	**$ 12,216,219**