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TOWN OF YORKTOWN

# Jacobs Road Solar Farm: Operations, Maintenance, and Sustainability Plan

**Jacob's Road Solar**  
**1805 Jacob Road, Town of Yorktown, Westchester New York**

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## Introduction

The purpose of this Operations and Maintenance (O&M) Plan is to provide a comprehensive framework for the safe, efficient, and sustainable operation of the Jacobs Road Solar Farm. This document outlines the procedures, responsibilities, and strategies necessary to maintain optimal system performance, ensure compliance with safety and regulatory standards, and support the long-term sustainability of the facility.

The O&M Plan is designed to guide all stakeholders involved in the project, including operations personnel, maintenance teams, and contractors, in the consistent execution of their duties. By adhering to the practices outlined herein, the solar farm will achieve its operational goals, contribute to renewable energy targets, and maintain positive relationships with the community and environment.

This document emphasizes the importance of clear communication, structured procedures, and regular oversight to ensure that all aspects of the solar farm's operation are effectively managed. By detailing actionable maintenance schedules, safety practices, and environmental stewardship initiatives, the plan serves as a practical tool for day-to-day operations and long-term planning.

The plan is organized into five sections. Section 1 addresses system monitoring, including performance metrics and seasonal considerations. Section 2 outlines operational responsibilities, including preventive and corrective maintenance. Section 3 focuses on the maintenance plan, highlighting vegetation management, screening maintenance, and inspections. Section 4 covers safety and compliance measures, while Section 5 emphasizes sustainability, environmental stewardship, and decommissioning strategies. Together, these sections provide a holistic approach to operating and maintaining the Jacobs Road Solar Farm.

# 1. System Monitoring

## 1.1 Purpose

The purpose of system monitoring is to ensure the solar farm operates efficiently and effectively by tracking energy production and system performance, detecting and resolving issues promptly, and supporting maintenance decisions and stakeholder reporting.

## 1.2 Monitoring Infrastructure

The monitoring infrastructure will adhere to industry standards and consist of systems for real-time data collection, remote accessibility, and automated alert management. Real-time data collection will track energy output, inverter performance, and battery charge/discharge cycles while environmental sensors measure irradiance, temperature, and wind speed. A cloud-based monitoring platform will provide secure remote access for the O&M team, with reliable data transmission supported by cellular and Ethernet connections. Automated alerts will be configured to notify the O&M team of performance deviations or equipment issues, ensuring prioritized responses to critical events.

## 1.3 Performance Metrics

Key performance indicators to track include energy yield (kWh/kWp), performance ratio (PR) compared to design expectations, downtime and fault occurrence rates, battery efficiency, discharge and charge patterns, and real-time inverter health and grid compliance.

## 1.4 Seasonal Considerations

### 1.4.1 Winter Operations

Winter operations will involve snow removal conducted after snowstorms to ensure optimal system performance and safe access for maintenance personnel. Snow will be manually or mechanically removed from the face of the panels and around electrical equipment to prevent shading and maintain functionality. Ice melt will be applied to gated entrances and areas frequently accessed by maintenance personnel to ensure safety and accessibility during operations.

### 1.4.2 Summer Operations

Summer operations will primarily involve mowing to manage grass growth within the fenced area. When feasible, sheep grazing will be incorporated as a complementary method to maintain vegetation while supporting the natural landscape. Additionally, weed control methods will be applied to prevent the spread of noxious weeds, ensuring compliance with local regulations and maintaining the site's aesthetics. All roadways within the fenced area will be sprayed regularly to prevent weed growth and ensure clear access for maintenance activities.

## 1.5 Reporting

The reporting process will include daily automated logging of data and alert summaries, monthly performance summaries covering energy production, downtime, and maintenance activities, and annual comprehensive reviews that offer insights into compliance, financial performance, and

system health. These reports will ensure transparency and keep all stakeholders informed of the system's operational status.

### 1.6 Escalation Procedures

Escalation procedures will involve a tiered response system to ensure timely resolution of issues. First-level responses will include O&M technicians inspecting and diagnosing problems promptly after receiving critical alerts. For more complex issues, specialized teams will be engaged to conduct repairs or recalibrations, with coordination initiated with ConEdison for grid-related concerns. In the case of critical failures, immediate notifications will be sent to site management and stakeholders, and backup systems will be deployed if necessary to maintain operations.

## 2. Operational Responsibilities

### 2.1 Purpose

The purpose of outlining operational responsibilities is to ensure that all activities necessary for the proper functioning, safety, and performance of the solar farm are clearly defined and delegated. This will provide a framework for preventive and corrective maintenance as well as administrative tasks.

### 2.2 Preventive Maintenance

Preventive maintenance will include regularly scheduled activities to minimize unexpected equipment failures and optimize performance. These activities will involve inspecting PV modules for damage, ensuring the proper functioning of inverters, removing debris from the site, and inspecting electrical connections and mounting systems. Semiannual checks will include inspecting screening and landscape health overall, inspecting and cleaning electrical equipment, adjusting system settings, and monitoring system performance to meet the required key performance indicators.

### 2.3 Corrective Maintenance

Corrective maintenance will address unplanned equipment failures and performance issues. Repairs will be conducted promptly to minimize downtime, utilizing an inventory of spare parts and specialized service providers as needed. Criteria will be established to decide whether components should be repaired or replaced based on cost-effectiveness and performance impacts.

### 2.4 Fire Safety and Emergency Response Practices

Fire safety is a critical component of operational responsibilities, particularly given the presence of electrical components and solar arrays that carry high electrical loads. All equipment and wiring will comply with the National Electrical Code (NEC) and other applicable safety standards to mitigate fire risks and ensure safe operation. Vegetation around electrical infrastructure will be carefully maintained to create a defensible space, minimizing the potential for fire spread and ensuring accessibility for emergency response efforts.

Freestone will coordinate closely with local fire departments to ensure they are familiar with the system design and response protocols. Site plans will be available on-site for local fire crews to

reference in the event of an emergency. These plans will detail the layout of electrical components, shutoff points, and access routes. Emergency shutoff switches will be prominently marked and easily accessible to allow for rapid deactivation of the system when necessary. Fire extinguishers and firefighting tools will be strategically placed throughout the site to enable quick action during smaller incidents.

Emergency response practices will include clear protocols for fire prevention, evacuation, and system shutdown procedures. Personnel will be trained in these measures during routine safety briefings, and annual reviews of the emergency response plan will be conducted to address any operational changes or new risks. Fire drills will also be held regularly to ensure readiness and identify opportunities for improvement.

## 2.4 Administrative Tasks

Administrative tasks will include maintaining comprehensive records of all maintenance activities, tracking warranty compliance, and ensuring contract obligations are met. These records will be updated in real-time using an online work order management system and will be auditable for transparency.

## 2.5 Contractor and Service Provider Oversight

All contractors and service providers will be required to adhere to safety standards and industry certifications, such as NABCEP and OSHA requirements. Financial solvency, insurance coverage, and qualifications of these providers will be verified prior to engagement.

# 3. Maintenance Plan

## 3.1 Purpose

The purpose of the maintenance plan is to ensure the solar farm operates at peak efficiency and reliability throughout its lifecycle. By implementing a structured and proactive maintenance plan, the risk of equipment failure, downtime, and performance degradation is minimized, while long-term system health is preserved.

## 3.2 Preventive Maintenance

Preventive maintenance activities will follow a scheduled plan to ensure that all components function optimally. Key tasks will include regular inspections of PV modules for damage, array mounting system checks, and cleaning debris around the system to prevent shading and electrical issues. Inverters and electrical equipment will be inspected for proper operation, and any adjustments to settings or components will be made as necessary. For energy storage systems, maintenance will focus on periodic inspections of battery enclosures, terminals, and specific operational parameters to ensure efficiency and safety.

## 3.3 Corrective Maintenance

Corrective maintenance will address unplanned events such as equipment malfunctions or performance deviations. Rapid response protocols will ensure that technicians can identify and resolve issues promptly to minimize downtime. Decisions to repair or replace components will be guided by cost-benefit analyses, ensuring that system reliability and operational efficiency are

prioritized. Spare parts for critical components, such as inverters, batteries, and wiring, will be stocked to facilitate timely repairs.

### 3.4 Vegetation Management

Vegetation management will form a critical part of the maintenance plan. During the growing season, Mowing will be the primary method of controlling grass and weeds within the fenced area. With the intention to incorporate sheep grazing when possible. Supplementary mowing will be performed as needed to manage areas not adequately maintained by grazing. Weed control measures, including the application of approved herbicides, will be implemented to prevent the spread of invasive and noxious weeds. Additionally, all roadways within the site will be sprayed periodically to ensure clear and safe access. Seasonal cutting of trees surrounding the solar array will be performed to minimize shading and prevent interference with solar panel performance.

### 3.5 Screening Maintenance

A landscaping plan is in place designed to maintain visual and environmental harmony with the surrounding area. This plan specifies the types of trees and shrubs to be planted and their locations across the site. Monthly inspections will be conducted during the first year to assess the condition and effectiveness of the screening vegetation, transitioning to annual inspections thereafter. Any gaps or damaged plants identified during these inspections will be addressed with replacement planting during the next appropriate planting season. This ongoing commitment to screening maintenance ensures the solar farm upholds its aesthetic and regulatory responsibilities while supporting local biodiversity and preserving the site's visual integrity.

### 3.6 Inspection and Testing

Regular inspections and system testing will verify compliance with operational standards. This will include testing inverters, combiner boxes, and transformers, as well as verifying the grounding system's continuity. Battery systems will be load-tested and capacity-tested to ensure optimal performance. All findings from inspections and tests will be documented and used to guide future maintenance activities.

## 4. Safety and Compliance

### 4.1 Purpose

The safety and compliance section ensures that all activities at the solar farm adhere to established safety standards and regulatory requirements. This framework aims to protect personnel, equipment, and the surrounding environment while maintaining operational integrity.

### 4.2 Personnel Safety

All personnel working on-site will be trained in safety protocols and emergency response procedures. OSHA compliance will be mandatory, and certifications such as NABCEP (North American Board of Certified Energy Practitioners) will be required for specific roles. Personal protective equipment (PPE), including arc-flash-rated clothing, helmets, gloves, and safety harnesses, will be provided and mandatory for all site activities. Regular safety briefings and drills will be conducted to ensure personnel remain prepared for potential hazards.



### 4.3 Emergency Response

An emergency response plan will be maintained and reviewed annually. This plan will include detailed procedures for addressing fires, medical emergencies, extreme weather, and other potential incidents. Coordination with local emergency services, including fire and medical teams, will ensure a rapid and effective response to any on-site emergencies. Clearly marked evacuation routes and assembly points will be established throughout the site.

### 4.4 Environmental Compliance

The solar farm will comply with all local, state, and federal environmental regulations. This includes adherence to guidelines for vegetation management, waste disposal, and emissions control. Measures will be taken to prevent runoff from herbicides and maintain proper drainage systems to minimize environmental impact.

### 4.5 Site Access and Security

To maintain safety and compliance, the solar farm will have controlled access points monitored by security systems. Gates and fences will be inspected regularly to ensure they remain secure and functional. All visitors and contractors will be required to sign in and adhere to on-site safety protocols. Unauthorized access will be prevented to ensure the safety of equipment and personnel.

### 4.6 Audits and Inspections

Regular audits and inspections will be conducted to ensure compliance with safety standards and regulatory requirements. This includes:

- Safety audits to evaluate the effectiveness of training, equipment, and procedures.
- Environmental inspections to confirm adherence to vegetation and waste management plans.
- Compliance reviews to ensure alignment with local, state, and federal regulations.

## 5. Sustainability, Environmental Stewardship, and Decommissioning

### 5.1 Purpose

This section ensures that the solar farm operates with a commitment to sustainability and environmental responsibility throughout its lifecycle, from active operations to eventual decommissioning and site restoration. The goal is to maximize positive environmental impacts while minimizing waste and disruption.

### 5.2 Sustainability and Carbon Offsets

The solar farm will contribute to local and global sustainability efforts by offsetting carbon emissions through renewable energy production. Annual reports will quantify the greenhouse gas reductions achieved, helping demonstrate progress toward state and national renewable energy targets. Sustainable practices, such as grazing sheep for vegetation management and maintaining native plant species, will further reduce the farm's environmental footprint.

### 5.3 Biodiversity and Habitat Preservation

The farm will actively promote biodiversity by maintaining vegetation that supports local wildlife, including pollinator-friendly plants where feasible. Screening vegetation will also contribute to preserving the natural aesthetic of the area. Any necessary pesticide or herbicide applications will be carefully managed to avoid harming local ecosystems. These efforts align with local environmental regulations and sustainability goals.

### 5.4 Waste and Recycling

Maintenance activities will include a commitment to reducing waste. Damaged solar panels, batteries, and other components will be recycled or repurposed where possible, following industry best practices and recycling programs. Proper disposal procedures will be followed for any hazardous materials, such as damaged battery cells, to ensure compliance with environmental regulations.

### 5.5 Decommissioning and Site Restoration

A decommissioning plan will be enacted to responsibly remove infrastructure and restore the site. This plan will include:

- The safe removal and recycling of solar panels, inverters, and battery systems.
- The removal of racking systems and other structural elements, with materials recycled wherever feasible.
- Restoration of the site to its original condition, including soil stabilization and replanting of native vegetation.
- Collaboration with local authorities to ensure all decommissioning activities meet or exceed regulatory requirements.