DOCKETED	
Docket Number:	09-AFC-05C
Project Title:	Abengoa Mojave Compliance
TN #:	231249
Document Title:	Mojave Solar 2018 Annual Report
Description:	Mojave Solar Project 2018 Annual Compliance Report
Filer:	Jose Manuel Bravo Romero
Organization:	Mojave Solar Project
Submitter Role:	Applicant
Submission Date:	12/16/2019 10:54:03 AM
Docketed Date:	12/16/2019

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

SUBMITTED ELECTRONICALLY

Subject:	**09-AFC-5C**
Condition Number:	**Compliance 7**
Description:	**Mojave Solar Project 2018 Annual Compliance Report**
Submittal Number:	**COMPLIANCE7-02-00**
Distribution:	**Keith Winstead, CEC; Kara Harris, US DOE; Wendy Campbell, CDFW; Ray Bransfield, USFWS; Thomas Dietsch, USFWS**

2/28/2019

Keith Winstead, CPM
California Energy Commission
1516 Ninth Street
Sacramento, California 95814
keith.winstead@energy.ca.gov

Dear Mr. Winstead,

The attached Mojave Solar Project 2018 Annual Compliance Report (09-AFC-5C) is submitted for your review as part of the ongoing reporting required by the California Energy Commission's Conditions of Certification for the Mojave Solar Project.

Sincerely,

Jose Manuel Bravo Romero
Manager
Compliance, Permitting, Quality and Environment Department

ABENGOA
NORTH AMERICA
ASI Operations LLC
Mojave Solar Project
42134 Harper Lake Rd
Hinkley, CA 92347
(303) 378-7302
jmanuel.bravo@abengoa.com

Attachment: 09-AFC-5C Mojave Solar Project 2018 Annual Compliance Report.

09-AFC-5C Mojave Solar Project
Annual Compliance Report
2018 reporting period

Prepared by:

Abengoa Solar Industrial Operations LLC.

for

Mojave Solar LLC
42134 Harper Lake Road
Hinkley, California 92347

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Appendix F

Air Quality 54

2018 AQ54-03-01 Gasoline Dispensing Tank Vapor Recovery Test results submitted to MDAQMD and to the CEC CPM

Mojave Solar Project
Annual Compliance Report
San Bernardino County, California

2018 Reporting Period

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Submitted electronically

Subject: **09-AFC-5C**
Condition Number : **AQ-54**
Description: **MDAQMD Rule 461 Gasoline Dispensing Tank Vapor Recovery Annual Test. Test results.**
Submittal Number: **AQ54-03-01**

April 26, 2018

Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814
Dale.Rundquist@energy.ca.gov

Dear Mr. Rundquist,

The attached documentation is submitted for your record. See the test results from the test performed on April 18th, 2018.

This Test results were submitted to the Air District directly from the testing company following Rule 461.

For your convenience, we are including the Compliance language below:

AQ-54: The project owner shall perform the following tests within 60 days of construction completion and annually thereafter in accord with the following test procedures:
a. Determination of Static Pressure Performance of Vapor Recovery Systems at Gasoline Dispensing Facilities with Aboveground Storage Tanks shall be conducted per current ARB Executive Orders and,
b. Phase I Adapters, Emergency Vents, Spill Container Drain Valve, Dedicated gauging port with drop tube and tank components, all connections, and fittings shall NOT have any detectable leaks; test methods shall be per current ARB Executive Orders, and
c. Liquid Removal Test (if applicable) per TP-201.6, and
Summary of Test Data shall be documented on a Form similar to the form in current ARB Executive Orders.
The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

The District shall receive passing test reports no later than six (6) weeks prior to the expiration date of this permit.

Verification: The project owner shall notify the District at least 10 days prior to performing the required tests. The test results shall be submitted to the District within 30 days of completion of the tests and shall be made available to the CPM if requested.

Should you have any questions or comments, please don't hesitate to contact me.

Sincerely,

Jose Manuel Bravo Romero
Manager
Permitting, Compliance, Quality & Environment Department
ABENGOA
NORTH AMERICA
ASI Operations LLC
Mojave Slar Project
42134 Harper Lake Rd
Hinkley, CA 92347

Cell: (303) 378-7302
jmanuel.bravo@abengoa.com

Attachments: AQ-54. Gasoline Dispensing Tank Vapor Recovery Annual Test. Test report.

ORANGE COAST
PETROLEUM EQUIPMENT, INC.

April 25, 2018

To: Rule 461 Testing
Mojave Desert AQMD
14306 Park Ave
Victorville, CA 92392

Regarding: Vapor Recovery
Mojave Solar LLC
Harper Lake Road
Hinkley, CA 92347

The following test reports are included;

If you have any questions, feel free to contact me at the office or email.

Respectfully,

Desir'ee Delgadillo
dburzo@ocpetroleum.com
(714) 744-4049
Orange Coast Petroleum Equipment, Inc
1015 North Parker Street
Orange, CA 92867

Rule 461 Vapor Recovery System Test Results Summary

Your gasoline dispensing facility (GDF) has ***passed*** one or more of the following California Air Resources Board (CARB) performance tests on your gasoline vapor recovery system:

☑	TP-206.3	Static Pressure Performance (Leak Decay) Test	☐	TP-201.1B	Static Torque of Rotatable Phase 1 Adaptors
☐	TP-201.3C	Piping Connections to UST's (Tie-Tank Test)	☐	TP-201.1C	Leak Rate of Drop Tube/Drain Valve Assembly
☑	TP-201.4	Dynamic Back Pressure	☐	TP-201.1D	Leak Rate of Drop Tube Overfill Prevention Device and Drain Valve
☐	TP-201.5	Air to Liquid Ratio Test	☑	TP201.1E	Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves
☑	TP-201.6C	Liquid Removal Rate Test	☐	OTHER	

Your gasoline dispensing facility (GDF) has ***failed*** one or more of the following California Air Resources Board (CARB) performance tests on your gasoline vapor recovery system:

☐	TP-201.3	Static Pressure Performance (Leak Decay) Test	☐	TP-201.1B	Static Torque of Rotatable Phase 1 Adaptors
☐	TP-201.3C	Piping Connections to UST's (Tie-Tank Test)	☐	TP-201.1C	Leak Rate of Drop Tube/Drain Valve Assembly
☐	TP-201.4	Dynamic Back Pressure	☐	TP-201.1D	Leak Rate of Drop Tube Overfill Prevention Device and Drain Valve
☐	TP-201.5	Air to Liquid Ratio Test	☐	TP201.1E	Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves
☐	TP-201.6C	Liquid Removal Rate Test	☐	OTHER	

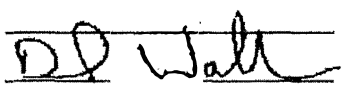
Rule 461 (e)(5) states that the owner/operator shall not operate or resume operation of a gasoline transfer and dispensing facility, unless the facility has successfully passed the applicable performance and reverification tests.

Continued operation of your GDF without passing tests is a violation of South Coast AQMD regulations and California Health and Safety Code. You may be subject to substantial financial and other legal penalties.

Notwithstanding the above, when a dispenser associated with any equipment that fails a reverification test, it must be isolated and shut down. The owner operator may continue operation of the remaining equipment if the test results demonstrate that the remaining equipment is functioning in good operating condition. All test results and the method of isolating defective equipment shall be documented in the test reports to be submitted to the Executive Officer pursuant to subparagraph (e)(7)(c), and also maintained/logged in the O & M manual on site.

You may seek administrative relief from the regulations through South Coast AQMD Hearing Board. **Be aware that filing a petition for relief does not authorize you to dispense gasoline;** you must wait until the Hearing Board reviews your case. Information concerning the Hearing Board can be obtained by calling the Clerk of the Board at (909) 396-2500 from 7:30 A.M. to 5:30 P.M., Tuesday through Friday.

GDF Contact: Print: _____ Signature: _____

Testing Person: Print: David Walker Signature: 

Testing person ID# 175771

Facility name: Mojave Solar LLC
Facility Address: Harper Lake Road, Hinkley, CA, 92347

AQMD ID#

Date: 4/18/2018

TP 206.3
AST Static Pressure Performance Test Report Form

Permit Number:		Date:	4/18/2018
Site Name:	Mojave Solar LLC	Company:	Belshire Environmental
Site Address:	Harper Lake Road	Technician:	David Walker
City:	Hinkley, CA, 92347		

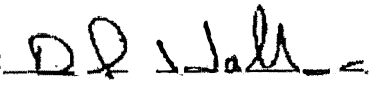
Test Information			
Number of Nozzles:	1	Are the tanks manifolded?	No
Phase I vapor recovery system executive order (as referenced on Permit to Operate)			VR 402
Phase I vapor recovery system configuration	☑ 2-Point	☐ Coaxial	
Phase II vapor recovery system executive order (as referenced on Permit to Operate)			Pre-EVR AST
Nitrogen introduction point:	☑ Phase I Vapor Coupler	☐ Phase I vent line	☐ Phase II vapor riser
Pressure measuring device:	☐ incline manometer	☑ digital manometer	☐ mechanical gauge
Calibration date for pressure measuring device (must be within 90 days of the test)			1/30/2018
Ending value for digital manometer drift test if applicable (must be 0.01 in wc or less)			0
Nitrogen introduction flow rate, (F)			2 CFM
Number of hoses with over 100mL (balance hoses must be drained prior to test)			0

Tank Information					
Tank Number	1	2	3	4	All
Product grade	87 Master				
Actual tank capacity (gallons)	2000				2000
Gasoline volume (gallons)	1,085				1085
Ullage (gallons)[1]	915				915
If tanks are not mainfolded, number of nozzles	1				

2 Inch Water Column Static Pressure Test					
Test Number	1	2	3	4	5
Start Time	8:30 AM				
Initial Pressure, inches of water column (in. wc)	2.00				
Pressure at one minute, in. wc	1.98				
Pressure at two minutes, in. wc	1.98				
Pressure at three minutes, in. wc	1.95				
Pressure at four minutes, in. wc	1.94				
Final pressure at five minutes, in. wc	1.92				
Allowable minimum pressure, in. wc	1.56				
Pass/Fail	Pass				

NOTE: [1]The minimum ullage during the test shall be 25% of the capacity and maximum shall be 75%.

I declare, under penalty of perjury under the laws of the state of California that based on information and belief formed after reasonable inquiry, the statements and information provided in the document are true, accurate, and complete.

Signature of Technician:  Date: 4/18/2018

Leak Rate and Cracking Pressure of P/V Vent Valves

Ref. No.:	
AQMD Id:	
Site Name:	Mojave Solar LLC
Address:	Harper Lake Road
	Hinkley, CA, 92347
Phone:	

Testing Company

Name:	Belshire Environmental
Address:	25971 Towne Centre Drive
	Foothill Ranch, CA 92610
Phone:	949-460-5200

P/V Valve Manufacturer:	Husky	Model Number:	5885	Pass/Fail:	Pass
Manufacturer Specified Positive Leak Rate (CFH):	0.05	Manufacturer Specified Negative Leak Rate (CFH):	0.21		
Measured Positive Leak Rate(CFH)	0.02	Measured Negative Leak Rate (CFH)	0.05		
Positive Cracking Pressure (in. H2O)	4.86	Negative Cracking Pressure (in. H2O)	8.46		

P/V Valve Manufacturer:		Model Number:		Pass/Fail:	
Manufacturer Specified Positive Leak Rate (CFH):		Manufacturer Specified Negative Leak Rate (CFH):			
Measured Positive Leak Rate(CFH)		Measured Negative Leak Rate (CFH)			
Positive Cracking Pressure (in. H2O)		Negative Cracking Pressure (in. H2O)			

P/V Valve Manufacturer:		Model Number:		Pass/Fail:	
Manufacturer Specified Positive Leak Rate (CFH):		Manufacturer Specified Negative Leak Rate (CFH):			
Measured Positive Leak Rate(CFH)		Measured Negative Leak Rate (CFH)			
Positive Cracking Pressure (in. H2O)		Negative Cracking Pressure (in. H2O)			

P/V Valve Manufacturer:		Model Number:		Pass/Fail:	
Manufacturer Specified Positive Leak Rate (CFH):		Manufacturer Specified Negative Leak Rate (CFH):			
Measured Positive Leak Rate(CFH)		Measured Negative Leak Rate (CFH)			
Positive Cracking Pressure (in. H2O)		Negative Cracking Pressure (in. H2O)			

P/V Valve Manufacturer:		Model Number:		Pass/Fail:	
Manufacturer Specified Positive Leak Rate (CFH):		Manufacturer Specified Negative Leak Rate (CFH):			
Measured Positive Leak Rate(CFH)		Measured Negative Leak Rate (CFH)			
Positive Cracking Pressure (in. H2O)		Negative Cracking Pressure (in. H2O)			

P/V Valve Manufacturer:		Model Number:		Pass/Fail:	
Manufacturer Specified Positive Leak Rate (CFH):		Manufacturer Specified Negative Leak Rate (CFH):			
Measured Positive Leak Rate(CFH)		Measured Negative Leak Rate (CFH)			
Positive Cracking Pressure (in. H2O)		Negative Cracking Pressure (in. H2O)			

Tester:	David Walker	Tester Id:	175771
Signature:		Test Date	4/18/2018

Liquid Removal
TP 201.6 C

Ref. No.:
AQMD Id.:
Site Name: Mojave Solar LLC
Address: Harper Lake Road
Hinkley, CA, 92347
Phone:

Testing Company

**Note: If using short version, disregard adhesion/evaporation column.*

Name: Belshire Environmental
Address: 25971 Towne Centre Drive
Foothill Ranch, CA 92610
Phone: 949-460-5200

Dispenser Number	Product Grade	Gasoline Added (VI), ml	Gasoline Dispensed (G), gal	Dispense Time (T), sec	Dispensing Rate (GPM) 60(G) / (T)	Gasoline Remaining (VF), ml	Adhesion/ Evaporation (VW), ml	Removal Rate ml/gal (VI-VW-VF)/G	Comments (Liquid Drained - No Test required if less than 25mL)
1	87								0 mL - No Test

Tester Name: David Walker
Signature:

Tester Id.: 175771
Test Date: 4/18/2018

Dynamic Pressure
TP 201.4

Ref. No.:
AQMD Id:
Site Name: Mojave Solar LLC
Address: Harper Lake Road
Hinkley, CA. 92347
Phone:

Testing Company

Name: Belshire Environmental Services, Inc
Address: 25971 Towne Centre Drive
Foothill Ranch, CA 92610
Phone: 949-460-5200

Dispenser Number	Product Grade	Nozzle Mfg. & Model Num.	60 CFH	80 CFH	Comments
1	87	VST-EVR-NB	0.12	0.21	Pass

	Rotameter calibration date (Annual)
1/3/2018	Pressure measuring device calibration date (Annual)
8:10 AM	Time of back pressure unit leak check (Prior to each sites' tests)
1	Final pressure decay of back pressure unit in 5 minute.

Tester: David Walker
Tester Id: 175771
Signature: DP Walk
Test Date: 4/18/2018

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Appendix G

Air Quality 58

2018 AQ58-02-00 Annual Fuel Throughput Request for Mojave Solar. Facility #3130 Company #1876

Mojave Solar Project
Annual Compliance Report
San Bernardino County, California

2018 Reporting Period

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Submitted electronically

Subject: **09-AFC-5C**
Condition Number : **AQ-58**
Description: **Annual Fuel Throughput 2018**
Submittal Number: **AQ58-02-00**

January 14, 2019

C. Navas
Mojave Desert Air Quality Management District
14306 Park Avenue
Victorville, CA 92392
cnavas@mdaqmd.ca.gov

Lon Payne, CPM
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814
leonidas.payne@energy.ca.gov

Dear Mr. Navas and Mr. Payne,

The attached documentation is submitted for your records as stated on the Permit to Operate N011039 and as requested on a notification received in our postal box on January 04, 2019. The form is completed and attached.

The information contained in this submittal will also be part of the ACR as it calls for in the compliance.

For your convenience, we are including the Compliance language below:

AQ-58. The annual throughput of gasoline shall not exceed 600,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required. [Regulation XIII; Rule 204]
Verification: The project owner shall submit to the CPM gasoline throughput records demonstrating compliance with this condition as part of the Annual Compliance Report. The project owner shall maintain on site the annual gasoline throughput records and shall make the site available for inspection of records by representatives

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

of the District, ARB, and the Energy Commission.

Should you have any questions or comments, please don't hesitate to contact me.

Sincerely,

Jose Manuel Bravo Romero
Manager
Quality & Environment Department
ABENGOA
NORTH AMERICA
ASI Operations LLC
42134 Harper Lake Rd
Hinkley, CA 92347

Cell: (303) 378-7302
jmanuel.bravo@abengoa.com

Attachments: MDAQMD VR Form 2018 annual report

THROUGHPUT
FUEL DISPENSING EQUIPMENT

Emission Year: 2018

Please fill out sections in grey AND return to:

Mojave Desert AQMD
14306 Park Ave
Victorville, CA 92392

or email completed form to cnavas@mdaqmd.ca.gov

Failure to respond by 2/28/2019 will result in enforcement action

Station Name	Company Number
Mojave Solar LLC	1876
42134 Harper Lake Road	Facility Number
Hinkley, CA 92347	3130
	District Permit Number
	N011039

Telephone Number 760-308-2601
Email Address jmanuel.bravo@abengoa.com

Type of Fuel Dispensed	Total Gallons Dispensed in 2018
Gasoline	18072.80 gallons
Diesel Fuel	24068.70 gallons
Other Fuel, Type:_____	N/A

CERTIFICATION

I, Jose Manuel Bravo Romero (*Name of Official*), a responsible official of Mojave Solar LLC (*Name of Facility*), hereby certify, based upon information and belief formed after reasonable inquiry, that the above information is true, accurate and complete. Executed this 14 (*Day*) day of January (*Month*), 2019 (*Year*) at San Bernardino, CA (*County and State*).

Signature

Jose Manuel Bravo Romero, Compliance, Q&E Manager
Name and Title

For Questions or Assistance call:
(760) 245-1661 x 4040

RECEIVED 1-4-19 KE

GDF Throughput Record

Calendar Year 2018

Month	Gallons of Diesel
January	1255.60
February	1001.10
March	0.00
April	11707.60
May	0.00
June	802.00
July	1400.00
August	1292.80
September	542.10
October	2978.20
November	2373.10
December	716.20
Total for the Year	**24068.70**

GDF Throughput Record

Calendar Year 2018

Month	Gallons of Gasoline
January	944.80
February	2495.00
March	950.30
April	1974.20
May	1300.00
June	101.20
July	1748.30
August	2508.50
September	800.10
October	1812.60
November	1570.20
December	1867.60
Total for the Year	**18072.80**

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Appendix H

Air Quality 63, 65, 70

2018 AQ72-05-00 Protocol for VOC & Benzene Emissions Testing on Carbon System for Annual Test. AQ-72-06-00/01/02 Annual Compliance Test results for VOC & Benzene Emissions, Carbon System submitted to the MDAQMD

Mojave Solar Project

Annual Compliance Report

San Bernardino County, California

2018 Reporting Period

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 602-734-7484
Hinkley, California 92347

Subject: **09-AFC-5C**
Condition: **AQ-72**
Description: **MDAQMD Permits to Operate**
Submittal Number: **AQ72-05-00**

June 13, 2018

Dale Rundquist
Compliance Project Manager
Siting, Transmission and Environmental Protection
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814
Office (916) 651-2072
Cell (916) 661-8174
Dale.Rundquist@Energy.ca.gov

Dear Mr. Rundquist,

Pursuant to Condition of Certification AQ-72, we are submitting the Protocol for VOC & Benzene Emissions Testing on Carbon Adsorption systems of the Mojave Solar Project for your review and records. The MDAQMD approval is also included.

Please accept this letter as a formal invitation to witness the test. The tentative schedule for the test is July 09, 2018.

For your convenience, we are including the Compliance language below:

AQ-72: The project owner shall conduct all required compliance/certification tests in accordance with a District-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for District review and approval. Written notice of the compliance/certification test shall be provided to the District ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the District within forty-five (45) days after testing is completed.

Verification:

The project owner shall provide a compliance test protocol to the District for approval and CPM for review at least thirty (30) days prior to the compliance tests. The project owner shall notify the District and the CPM within ten (10) working days before the execution of the compliance tests required in AQ-73 and AQ-74, and the test results shall be submitted to the District and to the CPM within forty-five (45) days after the tests are conducted.

Should you have any questions or comments, please don't hesitate to contact me.

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road Phone: 602-734-7484
Hinkley, California 92347

Sincerely,

Jose Manuel Bravo Romero
Manager
Quality & Environment Department
ABENGOA
NORTH AMERICA
ASI Operations LLC
42134 Harper Lake Rd
Hinkley, CA 92347
Cell: (303) 378-7302
jmanuel.bravo@abengoa.com

Attachments: Test protocol and MDAQMD submittal and approval.

SOURCE TEST PROTOCOL FOR COMPLIANCE TESTING OF TWO CARBON ADSORPTION UNITS AT MOJAVE SOLAR, LLC HINKLEY, CALIFORNIA

Prepared For:

Mojave Solar, LLC
42134 Harper Lake Road
Westminster, California 92347

For Submittal to:

Mojave Desert Air Quality Management District
14306 Park Ave
Victorville, California 92392

Prepared By:

Montrose Air Quality Services, LLC
1631 E. St. Andrew Pl.
Santa Ana, California 92705
(714) 279-6777

Joe Rubio

Production Date: **June 11, 2018**

Report Number: **002AS-437931-PP-59**

CONFIDENTIALITY STATEMENT

Except as otherwise required by law or regulation, this information contained in this communication is intended exclusively for the individual or entity to which it is addressed. This communication may contain information that is proprietary, privileged or confidential or otherwise legally exempt from disclosure. If you are not the named addressee, you are not authorized to read, print, retain, copy, or disseminate this message or any part of it.

To the best of our knowledge, the report has been checked for completeness, and the results presented are accurate, error-free, legible, and representative of the actual emissions measured during the test, and conform to the requirements of ASTM D7036-04, Standard Practice for Competence of Air Emission Testing Bodies (AETBs).

GENERAL INFORMATION

Source:	Carbon Adsorption System (CAS) – Alpha Carbon Adsorption System (CAS) – Beta
Source Location:	Mojave Solar, LLC 42134 Harper Lake Road Hinkley, California 92347
Contact:	Mr. Jose Manuel Bravo Telephone: 760-308-2601 ext. 86242 Email: jmanuel.bravo@abengoa.com
Permit Number:	C012015 – CAS Alpha C012016 – CAS Beta
Agency:	Mojave Desert Air Quality Management District 14306 Park Ave Victorville, CA 92392-4178
Contact:	Mr. Chris Anderson Telephone: 760-245-1661 Email: canderson@mdaqmd.ca.gov
Source Test Contractor:	Montrose Air Quality Services, LLC 1631 E. St. Andrew Place Santa Ana, CA 92705
Project Manager:	Joe Rubio Telephone: 714-332-8486 Email: jrubio@montrose-env.com
Proposed Test Date:	July 9, 2018

TABLE OF CONTENTS

SECTION **PAGE**

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

Montrose Air Quality Services, LLC (MAQS), was hired by Mojave Solar, LLC to conduct source emissions tests on two (2) Carbon Adsorption Systems (CAS) located in Hinkley, California. The purpose of the test will be to satisfy the compliance test requirements of the Mojave Desert Air Quality Management District (MDAQMD) Authority to Construct No. C012015 for the Alpha System and Authority to Construct No. C012016 for the Beta System.

2.0 EQUIPMENT AND PROCESS DESCRIPTION

2.1 UNIT DESCRIPTION

Carbon Adsorption System, HTF Ullage/Expansion System (Alpha) consisting of Carbon Adsorption System having two (2) multi-bed carbon filter sets capturing Ullage/Expansion system emissions. Ullage vent scrubber and overflow tank vent scrubber with each vent only to their own carbon filter set. Both sets were vented to Atmosphere through one common stack.

Carbon Adsorption System, HTF Ullage/Expansion System (Beta) consisting of Carbon Adsorption System having two (2) multi-bed carbon filter sets capturing Ullage/Expansion system emissions. Ullage vent scrubber and overflow tank vent scrubber with each vent only to their own carbon filter set. Both sets were vented to Atmosphere through one common stack.

2.2 PROCESS DESCRIPTION

The HTF expansion tank adsorbs any thermal dilation (both increase and reduction in volume) occurring in the HTF as a result of variations in temperature. The expansion tank must be free of atmospheric air to avoid degrading the HTF by oxygen and it must be pressurized to prevent the HTF from reaching its evaporation temperature. In order to achieve this, nitrogen is fed in when in the pressure in the tank drops, while nitrogen is expelled when the pressure in the tank increases as a result of an expansion in the HTF's volume. Nitrogen is expelled through the Ullage system to avoid releasing pollutant oil vapor into the atmosphere. This system is composed by an HTF Overflow Tank Vent Scrubber (MV-208), HTF Expansion Tank Vent Scrubber (MV-209); Carbon Filters (MF-206), and HTF Condensate Receiver Vessel (MV-207).

The Ullage system operates when the pressure in the HTF expansion header connected with the ullage system reach the remote set point in the vent control. This control (PIC-20626B) has a remote set point according with the pressure and the time, and the maximum value is 165 psia. Above this pressure, the vent valves will be full open in order to avoid overpressure in the system.

HTF vapors from the HTF Condensate Receiver Vessel (MV-207) or the HTF Overflow Tanks (MT-204A/B) are scrubbed in one of two scrubbers with cool HTF to condense as much HTF and low boilers (LB) as possible. The HTF used in these scrubbers comes from the HTF Tank Cooler (MX-205), normally at 70°F ±. After the scrubbers, these remaining HTF vapor streams are combined and routed through a series of three carbon filters to remove as many organics (VOCDs/HAPS) as possible before the vapors are release into the atmosphere. There is a nitrogen blanket system set at 8 bara providing nitrogen to the HTF vapor system (all the way back to the Expansion Vessels). The vent line to the carbon filters is designed to vent at 12 bara from the pressurized system but, the overflow system (that works at atmosphere pressure) start to vent at 14.40 psia, pressure set according with the pressure safety valve (PSV) in the overflow system.

There are two types of venting from the HTF system:

1. The venting of nitrogen due to HTF overflow tank breathing;
2. The daily venting of vapor space due to HTF expansion into the expansion vessels.

2.2.1 Overflow Tank Venting

As indicated above, during normal operation, there will be no exchange of HTF or nitrogen between the expansion vessels and the overflow tanks. However, during the winter months when the HTF temperature drops below the normal daily range, some of the HTF in the overflow tanks may need to be transferred into the expansion vessels to maintain the minimum expansion tank's level. During these conditions, the overflow tank levels may fall and rise, thus requiring nitrogen space venting. The worst case would be if the HTF system became very cold (limited to 120°F) after a few days of sun, in which case all the HTF from the overflow tanks would be pumped back into the system. The next time the system is brought back to normal operation, all of the HTF that was pumped out of the overflow tanks would return to the overflow tanks. Under that condition, the total amount of nitrogen vented is calculated to be 24,731 ft^3 total for both plants. The overflow tanks have vent scrubbers on their stacks before feeding into the carbon filters. Nitrogen and HTF mixture to be released passes through these scrubbers where it is cooled to 117°F by the cooled liquid HTF stream flowing countercurrent. This overflow tank vent scrubber will condense most of the HTF vapor vented from the overflow tanks before reaching the carbon filters. The overflow tanks have a design temperature of 350°F, but the worst-case vapor space temperature has been calculated to be around 250°F. The overflow tanks are designed to be maintained at 150°F to minimize HTF venting but at the same time be sufficiently higher than the high heat tracing (electric heating) initiation temperature of 120°F. The overflow tank has a liquid HTF cooler to maintain this tank's temperature at 150°F.

2.2.2 Expansion Vessel Venting

As the HTF expands and contracts daily into and out of the expansion vessels, the low boilers LB's along with some vaporous HTF will be released into the vapor space. To help this separation of LB's into the vapor space, a side stream of HTF will be also be sprayed to the top of the expansion vessels continuously. As the expansion vessels fill up with HTF, the nitrogen space is compressed until the pressure reaches 12 bara, upon which the vent valve opens and allows any further expansion to force the vapor space through the ullage system. The nitrogen and vapors will be pushed through the nitrogen ullage condenser, where most of the HTF and low boiler degradation products will be condensed and collected in the low boiler condensate receiver vessel. The nitrogen and other non-condensable constituents will pass through the expansion vessel vent scrubber where the 117°F, countercurrent liquid HTF flow will bring even more HTF and low boilers into the liquid phase. The nitrogen, degradation products, and vaporous HTF remaining in the vapor phase at the exit of the scrubber will enter the carbon filters for further cleaning before venting into the atmosphere.

3.0 TEST DESCRIPTION

3.1 OPERATING CONDITIONS DURING THE TEST

Both CAS units will be tested early in the morning during the peak venting time at their normal operating load condition. If the temperature does not allow the system to vent then the CAS will be operated manually to simulate the normal operating condition.

3.2 DIMENSIONS OF DUCT, STACKS, AND SAMPLING PORT LOCATIONS

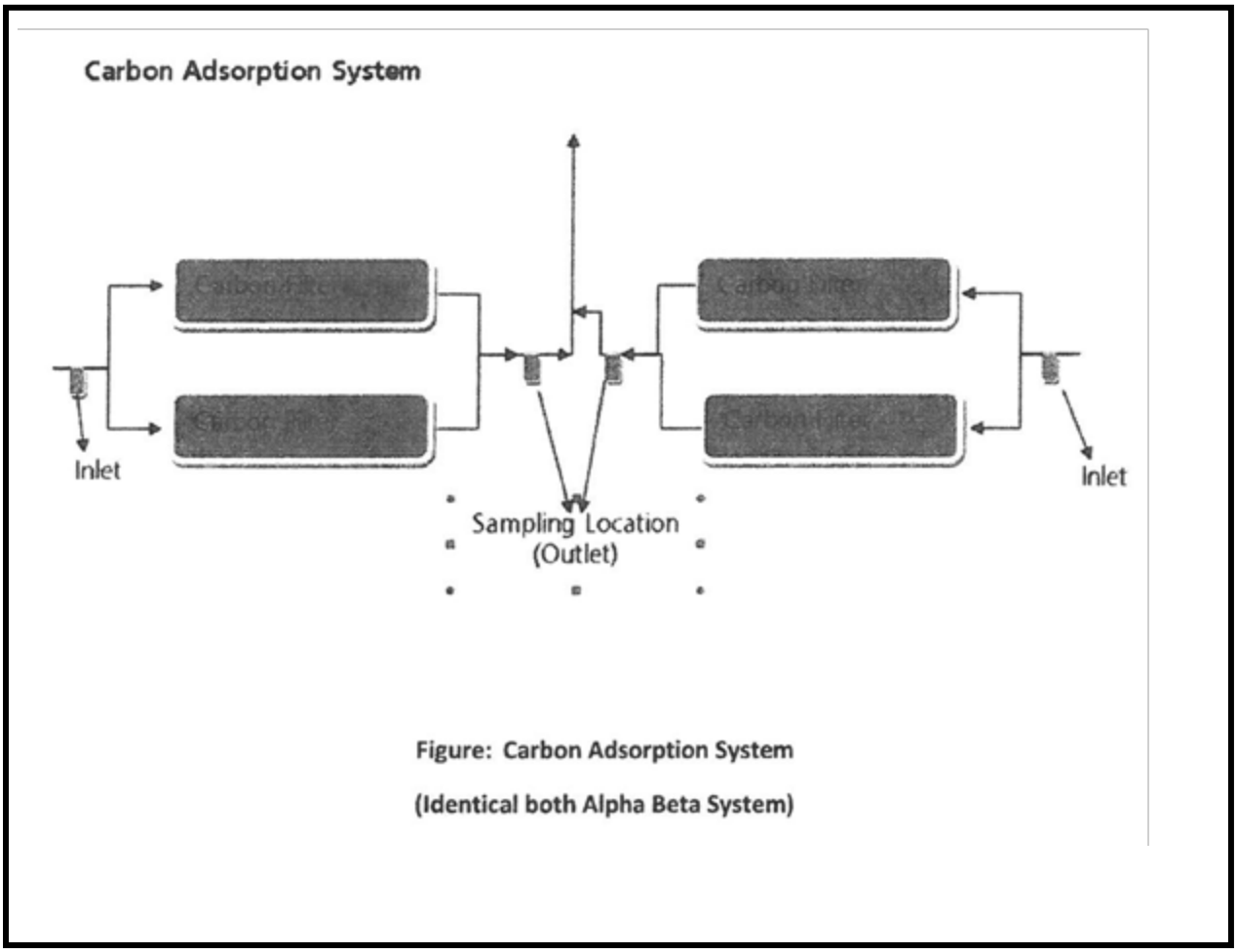
Table 3-1 presents the dimensions of the sampling port locations.

TABLE 3-1
SAMPLING PORT LOCATIONS
MOJAVE SOLAR, LLC

From Scrubber	
Inlet Sample Port Diameter	4 Inches
Outlet Sample Port Diameter	4 Inches
From Expansion Tank	
Inlet Sample Port Diameter	4 Inches
Outlet Sample Port Diameter	4 Inches

Figure 3-1 presents a line diagram of the CAS.

FIGURE 3-1
CAS DIAGRAM



3.3 SAMPLING AND ANALYTICAL PROCEDURES

Procedures that will be used to collect the data are summarized in Table 3-2.

TABLE 3-2
TEST PROCEDURES
MOJAVE SOLAR, LLC

Parameters	Location	Method	Number of Tests	Duration
Hexane	Inlet and Outlet	EPA Method 18	2*	5 Minutes
Benzene	Inlet and Outlet	CARB Method 410A	2*	5 Minutes
Flow Rate	Inlet and Outlet	CARB Method 2	1	5 Minutes
Moisture Content	Inlet and Outlet	Dry Wet Bulb	1	5 Minutes

3.3.1 Velocity and Volumetric Flow Rate

The exhaust gas velocity and volumetric flow rate will be determined according to the guidelines specified in CARB Methods 1 and 2.

3.3.2 Moisture Content

The moisture content at the exhaust will be determined by using dry and wet bulb temperature measurements.

3.3.3 Hexane and Benzene Emissions Testing

The concentrations of Benzene and Hexane at the CAS inlet and outlet will be determined following the procedures of CARB Method 410A along with reactive organic compounds (ROC) by EPA Method 18. Samples will be extracted from the inlet and outlet of the CAS simultaneously into Tedlar bags. The samples will be collected by placing an evacuated bag into a lung sampler and allowing the bag to fill by evacuating the air in the lung sampler. This procedure minimizes the possibility of the contamination from pumps, fittings and long lengths of tubing. The sample bags will be protected from sunlight by being placed in a larger black storage bag. The sample line will be comprised of a three-foot-long piece of 0.25” OD Teflon tubing connected directly to the bag. Each of the three samples will be collected over a period of approximately five minutes. The samples will then be delivered within 24 hours to a state certified lab, Quantum Laboratories in Carson California. The samples will be analyzed by packed column gas chromatography mass spectrophotometry (GC/MS).

4.0 RESULTS

A table similar to Table 4-1 will show the analytical results of the Hexane and Benzene sampling and the field measurements taken during the source test. Additional information such as field data, calibrations and permits will be located in the Appendices of the final report.

TABLE 4-1
ALPHA PLANT EMISSIONS SUMMARY
LOW PRESSURE
JULY 9, 2018

Parameter	Inlet Stack	Exhaust Stack	Compliance Limit
Hexane Data:			
ppm (v/v)			
lbs/hr			
lbs/year			**792.1**
Destruction Efficiency (%)			**95**
Benzene Data:			
ppm (v/v)			
lbs/hr			
lbs/year			**507.4**
Destruction Efficiency (%)			**95**
O_2 (%)			
CO_2 (%)			
Exhaust Gas Flow (dscfm)			

APPENDIX A

QUALITY ASSURANCE

APPENDIX A.1

QUALITY ASSURANCE PROGRAM SUMMARY

QUALITY ASSURANCE PROGRAM SUMMARY

As part of Montrose Air Quality Services, LLC (Montrose) ASTM D7036-04 certification, Montrose is committed to providing emission related data which is complete, precise, accurate, representative, and comparable. Montrose quality assurance program and procedures are designed to ensure that the data meet or exceed the requirements of each test method for each of these items. The quality assurance program consists of the following items:

- Assignment of an Internal QA Officer
- Development and use of an internal QA Manual
- Personnel training
- Equipment maintenance and calibration
- Knowledge of current test methods
- Chain-of-custody
- QA reviews of test programs

Assignment of an Internal QA Officer: Montrose has assigned an internal QA Officer who is responsible for administering all aspects of the QA program.

Internal Quality Assurance Manual: Montrose has prepared a QA Manual according to the requirements of ASTM D7036-04 and guidelines issued by EPA. The manual documents and formalizes all of Montrose QA efforts. The manual is revised upon periodic review and as Montrose adds capabilities. The QA manual provides details on the items provided in this summary.

Personnel Testing and Training: Personnel testing and training is essential to the production of high quality test results. Montrose training programs include:

- A requirement for all technical personnel to read and understand the test methods performed
- A requirement for all technical personnel to read and understand the Montrose QA manual
- In-house testing and training
- Quality Assurance meetings
- Third party testing where available
- Maintenance of training records.

Equipment Maintenance and Calibration: All laboratory and field equipment used as a part of Montrose emission measurement programs is maintained according to manufacturer's recommendations. A summary of the major equipment maintenance schedules is summarized in Table 1. In addition to routine maintenance, calibrations are performed on all sampling equipment according to the procedures outlined in the applicable test method. The calibration intervals and techniques for major equipment components is summarized in Table 2. The calibration technique may vary to meet regulatory agency requirements.

Knowledge of Current Test Methods: Montrose maintains current copies of EPA, ARB, and SCAQMD Source Test Manuals and Rules and Regulations.

Chain-of-Custody: Montrose maintains chain-of-custody documentation on all data sheets and samples. Samples are stored in a locked area accessible only to Montrose source test personnel. Data sheets are kept in the custody of the originator, program manager, or in locked storage until return to Montrose office. Electronic field data is duplicated for backup on secure storage media. The original data sheets are used for report preparation and any additions are initialed and dated.

QA Reviews: Periodic field, laboratory, and report reviews are performed by the in-house QA coordinator. Periodically, test plans are reviewed to ensure proper test methods are selected and reports are reviewed to ensure that the methods were followed and any deviations from the methods are justified and documented.

ASTM D7036-04 Required Information

Uncertainty Statement

"Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Montrose Air Quality Services, LLC (Montrose) personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, Montrose personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04. The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report."

Performance Data

Performance data are available for review.

Qualified Personnel

A qualified individual (QI), defined by performance on a third party or internal test on the test methods, will be present on each test event.

Plant Entry and Safety Requirements

Plant Entry

All test personnel are required to check in with the guard at the entrance gate or other designated area. Specific details are provided by the facility and project manager.

Safety Requirements

All personnel shall have the following personal protective equipment (PPE) and wear them where designated:

- Hard Hat
- Safety Glasses
- Steel Toe Boots
- Hearing Protection
- Gloves
- High Temperature Gloves (if required)

The following safety measures will be followed:

- Good housekeeping
- SDS for all on-site hazardous materials
- Confine selves to necessary areas (stack platform, mobile laboratory, CEMS data acquisition system, control room, administrative areas)
- Knowledge of evacuation procedures

Each facility will provide plant specific safety training.

TABLE 1
EQUIPMENT MAINTENANCE SCHEDULE

Equipment	Acceptance Limits	Frequency of Service	Methods of Service
Pumps	1. Absence of leaks 2. Ability to draw manufacturers required vacuum and flow	As recommended by manufacturer	1. Visual inspection 2. Clean 3. Replace parts 4. Leak check
Flow Meters	1. Free mechanical movement	As recommended by manufacturer	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero, span gas	As recommended by manufacturer	As recommended by manufacturer
Integrated sampling tanks	1. Absence of leaks	Depends on nature of use	1. Steam clean 2. Leak check
Mobile van sampling system	1. Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 4. Check for system contamination
Sampling lines	1. Sample degradation less than 2%	After each test series	1. Blow dry, inert gas through line until dry.

TABLE 2
MAJOR SAMPLING EQUIPMENT CALIBRATION REQUIREMENTS

Sampling Equipment	Calibration Frequency	Calibration Procedure	Acceptable Calibration Criteria
Continuous Analyzers	Before and After Each Test Day	3-point calibration error test	< 2% of analyzer range
Continuous Analyzers	Before and After Each Test Run	2-point sample system bias check	< 5% of analyzer range
Continuous Analyzers	After Each Test Run	2-point analyzer drift determination	< 3% of analyzer range
CEMS System	Beginning of Each Day	leak check	< 1 in. Hg decrease in 5 min. at > 20 in. Hg
Continuous Analyzers	Semi-Annually	3-point linearity	< 1% of analyzer range
NO_x Analyzer	Daily	NO_2 -> NO converter efficiency	> 90%
Differential Pressure Gauges (except for manometers)	Semi-Annually	Correction factor based on 5-point comparison to standard	+/- 5%
Differential Pressure Gauges (except for manometers)	Bi-Monthly	3-point comparison to standard, no correction factor	+/- 5%
Barometer	Semi-Annually	Adjusted to mercury-in-glass or National Weather Service Station	+/- 0.1 inches Hg
Dry Gas Meter	Semi-Annually	Calibration check at 4 flow rates using a NIST traceable standard	+/- 2%
Dry Gas Meter	Bi-Monthly	Calibration check at 2 flow rates using a NIST traceable standard	+/- 2% of semi-annual factor
Dry Gas Meter Orifice	Annually	4-point calibration for ΔH@	--
Temperature Sensors	Semi-Annually	3-point calibration vs. NIST traceable standard	+/- 1.5%

Note: Calibration requirements will be used that meet applicable regulatory agency requirements.

APPENDIX A.2

SCAQMD AND STAC CERTIFICATES

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 4, 2017

Mr. John Peterson
Montrose Air Quality Services, LLC (MAQS-SNA, Delta, SCEC)
1631 E. Saint Andrew Place
Santa Ana, CA 92705

Subject: LAP Approval Notice
Reference # 96LA1220

Dear Mr. Peterson:

We have reviewed your renewal letter under the South Coast Air Quality Management District's Laboratory Approval Program (SCAQMD LAP). We are pleased to inform you that your firm is approved for the period beginning September 30, 2017, and ending September 30, 2018 for the following methods, subject to the requirements in the LAP Conditions For Approval Agreement and conditions listed in the attachment to this letter:

SCAQMD Methods 1-4
SCAQMD Methods 10.1 and 100.1
USEPA CTM-030 and ASTM D6522-00
SCAQMD Rule 1420/1420.1/1420.2 – (Lead) Source and Ambient Sampling
SCAQMD Methods 5.1, 5.2, 5.3, 6.1
SCAQMD Methods 25.1 and 25.3 (Sampling)
SCAQMD Rule 1121/ 1146.2 Protocol

Your LAP approval to perform nitrogen oxide emissions compliance testing for SCAQMD Rule 1121/ 1146.2 Protocols includes satellite facilities located at:

McKenna Boiler
1510 North Spring Street
Los Angeles, CA 90012

Noritz America Corp.
11160 Grace Avenue
Fountain Valley, CA 92708

Ajax Boiler, Inc.
2701 S. Harbor Blvd.
Santa Ana, CA 92704

Thank you for participating in the SCAQMD LAP. Your cooperation helps us to achieve the goal of the LAP: to maintain high standards of quality in the sampling and analysis of source emissions. You may direct any questions or information to LAP Coordinator, Glenn Kasai. He may be reached by telephone at (909) 396-2271, or via e-mail at gkasai@aqmd.gov.

Sincerely,

D. Sarkar

Dipankar Sarkar
Program Supervisor
Source Test Engineering

DS:GK/gk

Attachment

171004 LapRenewalRev.doc

STAC
STACK TESTING ACCREDITATION COUNCIL

American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this organization is accredited to perform testing activities in compliance with ASTM D7036 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 2nd day of February 2016

Senior Director of Quality and Communications
Certificate Number 3925.01
Valid to February 28, 2018

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

MONTROSE AIR QUALITY SERVICES

APPENDIX A.3

STATEMENT OF NO CONFLICT OF INTEREST

STATEMENT OF NO CONFLICT OF INTEREST AS AN INDEPENDENT TESTING LABORATORY

(To be completed by authorized source testing firm representative and included in source test report)

The following facility and equipment were tested by my source testing firm and are the subjects of this statement:

Facility ID:	
Date(s) Tested:	**July 9, 2018**
Facility Name:	**Mohave Solar, LLC**
Equipment Address:	**42134 Harper Lake Road**
	Hinkley, California 92347
Equipment Tested:	**Two Carbon Adsorption Units**
Device ID, A/N, P/N:	**C012015, C012016**

I state, as its legally authorized representative, that the source testing firm of:

Source Test Firm: Montrose Air Quality Services, LLC

Business Address: 1631 E. St. Andrew Pl.

Santa Ana, California 92705

is an "Independent Testing Laboratory" as defined in ***District Rule 304(k):***

For the purposes of this Rule, when an independent testing laboratory is used for the purposes of establishing compliance with District rules or to obtain a District permit to operate, it must meet all of the following criteria:

(1) The testing laboratory shall have no financial interest in the company or facility being tested, or in the parent company, or any subsidiary thereof -

(2) The company or facility being tested, or parent company or any subsidiary thereof, shall have no financial interest in the testing laboratory;

(3) Any company or facility responsible for the emission of significant quantities of pollutants to the atmosphere, or parent company or any subsidiary thereof shall have no financial interest in the testing laboratory; and

(4) The testing laboratory shall not be in partnership with, own or be owned by, in part or in full, the contractor who has provided or installed equipment (basic or control), or monitoring systems, or is providing maintenance for installed equipment or monitoring systems, for the company being tested.

Furthermore, I state that any contracts or agreements entered into by my source testing firm and the facility referenced above, or its designated contractor(s), either verbal or written, are not contingent upon the outcome of the source testing, or the source testing information provided to the SCAQMD.

Signature: Joe Rubio **Date:** **6/11/2018**

Joe Rubio	**Client Project Manager**	**714-279-6777**	**6/11/2018**
(Name)	(Title)	(Phone)	(Date)

FORM ST-110 :stevforl.doc (Revised 11/18/98

APPENDIX B

GENERAL EMISSIONS CALCULATIONS

GENERAL EMISSION CALCULATIONS

I. Stack Gas Velocity

A. Stack gas molecular weight, lb/lb-mole

$$MW_{dry} = 0.44 * \%CO_2 + 0.32 * \%O_2 + 0.28 * \%N_2$$

$$MW_{wet} = MW_{dry} * (1 - B_{wo}) + 18 * B_{wo}$$

B. Absolute stack pressure, iwg

$$Ps = Pbar + \frac{Psg}{13.6}$$

C. Stack gas velocity, ft/sec

$$V_s = 2.9 * C_p * \sqrt{\Delta P} * \sqrt{T_s} * \sqrt{\frac{29.92 * 28.95}{P_s * MW_{wet}}}$$

II. Moisture

A. Sample gas volume, dscf

$$V_{mstd} = 0.03342 * V_m * (P_{bar} + \frac{\Delta H}{13.6}) * \frac{T_{ref}}{T_m} * Y_d$$

B. Water vapor volume, scf

$$V_{wstd} = 0.0472 * V_{lc} * \frac{T_{ref}}{528\ ^oR}$$

C. Moisture content, dimensionless

$$B_{wo} = \frac{V_{wstd}}{(V_{mstd} + V_{wstd})}$$

III. Stack gas volumetric flow rate

A. Actual stack gas volumetric flow rate, wacfm

$$Q = V_s * A_s * 60$$

B. Standard stack gas flow rate, dscfm

$$Q_{sd} = Q * (1 - B_{wo}) * \frac{T_{ref}}{T_s} * \frac{P_s}{29.92}$$

IV. Gaseous Mass Emission Rates, lb/hr

$$M = \frac{ppm * MW_i * Q_{sd} * 60}{SV * 10^6}$$

V. Emission Rates, lb/MMBtu

$$\frac{lb}{MMBtu} = \frac{ppm * MW_i * F}{SV * 10^6} * \frac{20.9}{20.9 - \%O_2}$$

6. Percent Isokinetic

$$I = \frac{17.32 x T_s (V_m std)}{(1 - Bwo) 0 x V_s x Ps x Dn^2} x \frac{528 oR}{T_{ref}}$$

7. Particulate emissions

a) Grain loading, gr/dscf

$C = 0.01543 (M_n/V_{m\ std})$

b) Grain loading at 12% CO_2, gr/dscf

$C_{12\%}\ CO_2 = C (12/\%\ CO_2)$

c) Mass emissions, lb/hr

M = C x Qsd x (60 min/hr)/(7000 gr/lb)

d) Particulate emission factor

$$lb/10^6 Btu = Cx \frac{1lb}{7000gr} xFx \frac{20..9}{20.9 - \%O_2}$$

Nomenclature:

A_s	= stack area, ft^2
B_{wo}	= flue gas moisture content, dimensionless
$C_{12\%CO2}$	= particulate grain loading, gr/dscf corrected to 12% CO_2
C	= particulate grain loading, gr/dscf
C_p	= pitot calibration factor, dimensionless
Dn	= nozzle diameter, in.
F	= fuel F-Factor, dscf/MMBtu @ 0% O_2
H	= orifice differential pressure, iwg
I	= % isokinetics
M_n	= mass of collected particulate, mg
M_i	= mass emission rate of specie i, lb/hr
MW	= molecular weight of flue gas, lb/lb-mole
M_{wi}	= molecular weight of specie i: SO_2: 64 NO_x: 46 CO: 28 HC: 16
0	= sample time, min.
ΔP	= average velocity head, iwg = $(\sqrt{\Delta P})^2$
P_{bar}	= barometric pressure, inches Hg
P_s	= stack absolute pressure, inches Hg
P_{sg}	= stack static pressure, iwb
Q	= wet stack flow rate at actual conditions, wacfm
Q_{sd}	= dry standard stack flow rate, dscfm
SV	= specific molar volume of an ideal gas at standard conditions, ft^3/lb-mole
T_m	= meter temperature, °R
T_{ref}	= reference temperature, °R
T_s	= stack temperature, °R
V_s	= stack gas velocity, ft/sec
V_{lc}	= volume of liquid collected in impingers, ml
V_m	= uncorrected dry meter volume, dcf
V_{mstd}	= dry meter volume at standard conditions, dscf
V_{wstd}	= volume of water vapor at standard conditions, scf
Y_d	= meter calibration coefficient

APPENDIX C

COPY OF PERMIT TO OPERATE

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 — 800.635.4617 — FAX 760.245.2022

PERMIT TO OPERATE

C012015

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: SEPTEMBER 2018

OWNER OR OPERATOR (Co.#1876)
Mojave Solar LLC
42134 Harper Lake Road
Hinkley, CA 92347

EQUIPMENT LOCATION (Fac.#3130)
Mojave Solar - Harper Lake
Harper Lake Road, adjacent to SEGS VIII & IX
Hinkley, CA 92347

Description:
CARBON ADSORPTION SYSTEM, HTF ULLAGE/EXPANSION SYSTEM (ALPHA) consisting of: Carbon adsorption system having two (2) multi-bed carbon filter sets capturing ullage/expansion system emissions. Ullage vent scrubber and overflow tank vent scrubber will each vent only to their own carbon filter set. Both sets will vented to atmosphere through one common stack.

CONDITIONS:

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment must be in use and operating properly at all times the HTF ullage/expansion system with valid District Permit B011046 is venting.

3. This carbon adsorption system shall provide at a minimum 95% control efficiency of VOC emissions vented from the HTF ullage/expansion system under valid District Permit B011046. Control efficiency shall be demonstrated by sampling VOC emissions per US EPA Method 25 at the inlet and outlet of the carbon beds during initial and annual compliance tests.

4. The owner/operator shall prepare and submit a monitoring and change-out plan for the carbon adsorption system which ensures that the system is operating at optimal control efficiency at all times for District approval 60 days prior to commercial operation date (COD). Once approved, any subsequent changes to the monitoring and change-out plan must be submitted in

Fee Schedule: 7 (h) | Rating: 1 device | SIC: 4911 | SCC: 30688801 | Location/UTM(Km): 470E/3877N

This permit does not authorize the emission of air contaminants in excess of those allowed by law, including Division 26 of the Health and Safety Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Mojave Solar LLC
42134 Harper Lake Road

Hinkley, CA 92347

By:
Brad Poiriez
Air Pollution Control Officer

writing to the District for approval prior to implementation.

5. Total emissions of VOC to the atmosphere shall not exceed 792.1 lbs/year, calculated based on the most recent test results.

6. Total emissions of benzene to the atmosphere shall not exceed 507.4 lbs/year, calculated based on the most recent test results.

7. During operation, o/o shall monitor VOC (as hexane) measured at outlet from the carbon beds. Sampling is to be performed at a minimum on a weekly basis. Samples shall be analyzed using a District approved photo ionization detector (PID).

8. PID shall be considered invalid if not calibrated in accordance with the manufactures recommended calibration procedures.

9. The o/o shall maintain an operations log (in electronic or hardcopy format) current and on-site for a period of five (5) years. The log shall contain at a minimum the following information and shall be provided to District personnel upon request.
a. Date and time of VOC monitoring;
b. Results of VOC monitoring; and
c. Date and description of all maintenance, malfunctions, repairs, and carbon change out(s).

10. The o/o shall provide stack sampling ports and platforms necessary to perform source tests required to verify compliance with District rules, regulations and permit conditions. The location of these ports and platforms shall be subject to District approval.

11. Prior to January 31 of each new year, the o/o of this unit shall submit to the District a summary report of all VOC emissions (based on annual source test results).

12. The o/o shall conduct all required compliance/certification tests in accordance with a District-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for District review and approval. Written notice of the compliance/certification test shall be provided to the District ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the District within forty-five (45) days after testing is completed.All compliance/certification test notifications, protocols, and results may be submitted electronically to reporting@mdaqmd.ca.gov

13. The o/o shall perform the following initial compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District within 180 days of COD. The following compliance tests are required:
a. VOC as hexane in ppmvd and lb/hr (measured per USEPA Reference Methods 25 and 18 or equivalent).
b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

14. The o/o shall perform the following compliance tests on this equipment at least once every twelve (12) months in accordance with the MDAQMD Compliance Test Procedural Manual. The following compliance tests are required:
a. VOC as hexane in ppmvd and lb/hr (measured per USEPA Reference Methods 25A and 18 or equivalent).
b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

Additionally, records of all compliance tests shall be maintained on site for a period of five (5) years and presented to District personnel upon request.

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

C012016

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: SEPTEMBER 2018

OWNER OR OPERATOR (Co.#1876)
Mojave Solar LLC
42134 Harper Lake Road
Hinkley, CA 92347

EQUIPMENT LOCATION (Fac.#3130)
Mojave Solar - Harper Lake
Harper Lake Road, adjacent to SEGS VIII & IX
Hinkley, CA 92347

Description:
CARBON ADSORPTION SYSTEM, HTF ULLAGE/EXPANSION SYSTEM (BETA) consisting of: Carbon adsorption system having two (2) multi-bed carbon filter sets capturing ullage/expansion system emissions. Ullage vent scrubber and overflow tank vent scrubber will each vent only to their own carbon filter set. Both sets will vented to atmosphere through one common stack.

CONDITIONS:

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment must be in use and operating properly at all times the HTF ullage/expansion system with valid District Permit B011047 is venting.

3. This carbon adsorption system shall provide at a minimum 95% control efficiency of VOC emissions vented from the HTF ullage/expansion system under valid District Permit B011047. Control efficiency shall be demonstrated by sampling VOC emissions per US EPA Method 25 at the inlet and outlet of the carbon beds during initial and annual compliance tests.

4. The owner/operator shall prepare and submit a monitoring and change-out plan for the carbon adsorption system which ensures that the system is operating at optimal control efficiency at all times for District approval 60 days prior to commercial operation date (COD). Once approved, any subsequent changes to the monitoring and change-out plan must be submitted in

Fee Schedule: 7 (h)	Rating: 1 device	SIC: 4911	SCC: 30688801	Location/UTM(Km): 470E/3877N

This permit does not authorize the emission of air contaminants in excess of those allowed by law, including Division 26 of the Health and Safety Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Mojave Solar LLC
42134 Harper Lake Road

Hinkley, CA 92347

By: _____
Brad Poiriez
Air Pollution Control Officer

writing to the District for approval prior to implementation.

5. Total emissions of VOC to the atmosphere shall not exceed 792.1 lbs/year, calculated based on the most recent test results.

6. Total emissions of benzene to the atmosphere shall not exceed 507.4 lbs/year, calculated based on the most recent test results.

7. During operation, o/o shall monitor VOC (as hexane) measured at outlet from the carbon beds. Sampling is to be performed at a minimum on a weekly basis. Samples shall be analyzed using a District approved photo ionization detector (PID).

8. PID shall be considered invalid if not calibrated in accordance with the manufactures recommended calibration procedures.

9. The o/o shall maintain an operations log (in electronic or hardcopy format) current and on-site for a period of five (5) years. The log shall contain at a minimum the following information and shall be provided to District personnel upon request.
a. Date and time of VOC monitoring;
b. Results of VOC monitoring; and
c. Date and description of all maintenance, malfunctions, repairs, and carbon change out(s).

10. The o/o shall provide stack sampling ports and platforms necessary to perform source tests required to verify compliance with District rules, regulations and permit conditions. The location of these ports and platforms shall be subject to District approval.

11. Prior to January 31 of each new year, the o/o of this unit shall submit to the District a summary report of all VOC emissions (based on annual source test results).

12. The o/o shall conduct all required compliance/certification tests in accordance with a District-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for District review and approval. Written notice of the compliance/certification test shall be provided to the District ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the District within forty-five (45) days after testing is completed.

13. The o/o shall perform the following initial compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District within 180 days of COD. The following compliance tests are required:
a. VOC as hexane in ppmvd and lb/hr (measured per USEPA Reference Methods 25 and 18 or equivalent).
b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

All compliance/certification test notifications, protocols, and results may be submitted electronically to reporting@mdaqmd.ca.gov

14. The o/o shall perform the following compliance tests on this equipment at least once every twelve (12) months in accordance with the MDAQMD Compliance Test Procedural Manual. The following compliance tests are required:
a. VOC as hexane in ppmvd and lb/hr (measured per USEPA Reference Methods 25A and 18 or equivalent).
b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

Additionally, records of all compliance tests shall be maintained on site for a period of five (5) years and presented to District personnel upon request.

THIS IS THE LAST PAGE OF THIS DOCUMENT

If you have any questions, please contact one of the following individuals by email or phone.

Name: Mr. Joe Rubio
Title: Client Project Manager
Region: Southwest
E-Mail: JRubio@montrose-env.com
Phone: (714) 279-6777

Name: Mr. Matt McCune
Title: Regional Vice President
Region: Southwest
E-Mail: MMccune@montrose-env.com
Phone: (714) 279-6777

José Manuel Bravo Romero

From: Chris Anderson <canderson@mdaqmd.ca.gov>
Sent: Wednesday, June 13, 2018 11:00 AM
To: Reporting; 'Joseph Rubio'
Cc: José Manuel Bravo Romero; May Mamari
Subject: RE: Mojave Solar Test Plan

Reviewed and approved. I am interested in viewing the test and will notify nearer the date of the test to let you know if I will be there.

Regards

Chris

From: Reporting
Sent: Tuesday, June 12, 2018 8:26 AM
To: 'Joseph Rubio'
Cc: José Manuel Bravo Romero; Chris Anderson
Subject: RE: Mojave Solar Test Plan

Submission received.

Thank you, kindly.

S h e r i H a g g a r d
Permit Engineering Supervisor
Office: 760.245.1661, extension 1864

MOJAVE air quality management district DESERT 25

www.MDAQMD.ca.gov

From: Joseph Rubio [mailto:jrubio@montrose-env.com]
Sent: Tuesday, June 12, 2018 6:49 AM
To: Reporting
Cc: José Manuel Bravo Romero
Subject: Mojave Solar Test Plan

Good morning: Attached is the electronic copy of the source test protocol for the proposed compliance testing on two (2) carbon adsorption units at Mojave Solar facility in Hinkley, Ca. The test program will be identical to the ones conducted in previous years and is tentatively scheduled to be conducted on July 9, 2018, pending protocol approval. We are submitting it on behalf of Mr. Jose Manuel Bravo, of Mojave Solar, LLC. A

hard copy of the test plan was also sent out to Mr. Chris Anderson of the MDAQMD. If you have any questions regarding the test plan please contact me.

Regards,

Joe Rubio
Client Project Manager
Montrose Air Quality Services, LLC
1631 E. Saint Andrew Place, Santa Ana, CA 92705
O: 714-332-8486; M: 626-831-7707
jrubio@montrose-env.com
www.montrose-env.com

José Manuel Bravo Romero

From: Reporting <reporting@mdaqmd.ca.gov>
Sent: Tuesday, June 5, 2018 2:17 PM
To: José Manuel Bravo Romero; Chris Anderson
Cc: Alan De Salvio; Brad Poiriez
Subject: RE: Carbon adsorption test schedule for Mojave Solar LLC.

Hi Jose,

All requests for extensions must be approved by our Executive Director, Brad Poiriez.

He has approved your request to extend the source test date to July 9, 2018 for permits C012015 and C012016. Please make sure to provide us a testing protocol as soon as possible, as we usually require that 45 days in advance unless it's a previously approved protocol.

Please submit the protocol and results to reporting@mdaqmd.ca.gov

Thank you, kindly.

Sheri Haggard
Permit Engineering Supervisor
Office: 760.245.1661, extension 1864

MOJAVE air quality management district DESERT 25

www.MDAQMD.ca.gov

From: José Manuel Bravo Romero [mailto:jmanuel.bravo@abengoa.com]
Sent: Monday, June 4, 2018 7:11 AM
To: Reporting; Chris Anderson
Subject: RE: Carbon adsorption test schedule for Mojave Solar LLC.

Good morning,

The affected permits are C012015 and C012016, for Alpha and Beta plants respectively.

Last year we performed the test on July 7th.

Best regards / Saludos.

José Manuel Bravo Romero.
Manager. Permitting, Compliance, Quality & Environmental Department.

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road
Hinkley, CA 92347

Office: 760-308-2601 ext. 418
Mobile: 303-378-7302
jmanuel.bravo@abengoa.com
www.abengoa.com

Eco-Tip: Printing e-mails is usually a waste

From: Reporting <reporting@mdaqmd.ca.gov>
Sent: Saturday, June 2, 2018 4:04 PM
To: José Manuel Bravo Romero <jmanuel.bravo@abengoa.com>; Chris Anderson <canderson@mdaqmd.ca.gov>
Subject: RE: Carbon adsorption test schedule for Mojave Solar LLC.

Hi Jose,

What is the permit number for the source test in question?

Sheri Haggard
Permit Engineering Supervisor
Office: 760.245.1661, extension 1864

MOJAVE air quality management district DESERT 25

www.MDAQMD.ca.gov

From: José Manuel Bravo Romero [mailto:jmanuel.bravo@abengoa.com]
Sent: Thursday, May 31, 2018 11:08 AM
To: Reporting; Chris Anderson
Subject: Carbon adsorption test schedule for Mojave Solar LLC.

Good morning,

We have to perform the annual Carbon Adsorption test the first week of July, by the 7th. The Testing company do not have any available test days the last week of June or the first week of July. Would we be able to do the testing on Monday, July 9, 2018?

Thank you for your help in advance.

Best regards / Saludos.

José Manuel Bravo Romero.
Manager. Permitting, Compliance, Quality & Environmental Department.

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road
Hinkley, CA 92347

Office: 760-308-2601 ext. 418
Mobile: 303-378-7302
jmanuel.bravo@abengoa.com
www.abengoa.com

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Appendix I

Air Quality 70

2018 AQ-70-04-00. Annual summary VOC emissions report (09-AFC-5C). MDAQMD Facility #3130 Company #1876

Mojave Solar Project
Annual Compliance Report
San Bernardino County, California

2018 Reporting Period

ABENGOA
NORTH AMERICA

Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Subject: **09-AFC-5C**
Condition: **AQ-70**
Description: **Summary report of all VOC emissions based on annual test results. Year 2018.**
Submittal Number: **AQ-70-04-00**

January 4, 2019

Lon Payne, CPM
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Christian Anderson, Air Quality Engineer
Mojave Air Quality Management District
14306 Park Avenue
Victorville, California 92392

Dear Mr. Payne and Mr. Anderson,

Pursuant to Condition of Certification AQ-70, following Condition 11 of the Permits to operate numbers C012015 and C012016 attached is the annual summary report of all Mojave Solar LLC, VOC emissions.

The emissions for Alpha, since it is under a forced outage and the test was not able to be performed, are based on the previous year's emission data.

As always, please contact me with any question.

Sincerely,

Jose Manuel Bravo Romero

Manager
Quality & Environment Department
ABENGOA
NORTH AMERICA
ASI Operations LLC
42134 Harper Lake Rd
Hinkley, CA 92347

Cell: (303) 378-7302
jmanuel.bravo@abengoa.com

Attachments: Summary report of all VOC emissions based on annual test results.

2018 Ullage emission - based on 12/03/2018 test data

Mojave Solar LLC

Hours venting

	Alpha		Beta	
	Expansion	Overflow	Expansion	Overflow
Jan	70.25	233	67.125	216.5
Feb	71.625	332	62.5	210.25
Mar	69.375	442.5	70.25	336.75
Apr	69.625	627	69.25	555.5
May	87	729	88.625	640.25
Jun	73.25	720	80.875	700
Jul	80	744	83.875	720
Aug	74.375	744	85	720
Sep	53.25	720	75.125	693.5
Oct	47.25	741.25	69.875	565.5
Nov	17.375	625.25	70.125	330.25
Dec	17.375	625.25	70.125	330.25
Annual Total	731	7283	893	6019

VOCs as C6, lb

Alpha		Beta	
Expansion	Overflow	Expansion	Overflow
0.0077275	0.096695	1.47675	1.299
0.0078788	0.13778	1.375	1.2615
0.0076313	0.1836375	1.5455	2.0205
0.0076588	0.260205	1.5235	3.333
0.00957	0.302535	1.94975	3.8415
0.0080575	0.2988	1.77925	4.2
0.0088	0.30876	1.84525	4.32
0.0081813	0.30876	1.87	4.32
0.0058575	0.2988	1.65275	4.161
0.0051975	0.3076188	1.53725	3.393
0.0019113	0.2594788	1.54275	1.9815
0.0019113	0.2594788	1.54275	1.9815
0.1	**3.0**	**19.6**	**36.1**

benzene, lb

Alpha		Beta	
Expansion	Overflow	Expansion	Overflow
0.10853625	0.1165	0.8390625	0.32475
0.11066063	0.166	0.78125	0.315375
0.10718438	0.22125	0.878125	0.505125
0.10757063	0.3135	0.865625	0.83325
0.134415	0.3645	1.1078125	0.960375
0.11317125	0.36	1.0109375	1.05
0.1236	0.372	1.0484375	1.08
0.11490938	0.372	1.0625	1.08
0.08227125	0.36	0.9390625	1.04025
0.07300125	0.370625	0.8734375	0.84825
0.02684438	0.312625	0.8765625	0.495375
0.02684438	0.312625	0.8765625	0.495375
1.13	**3.64**	**11.16**	**9.03**

Calculation notes:
- Vent valves are considered close if it is <2% open.
- 15 min average valve positions are used to determine whether each vent valve is open or close.
- In case of bad PI data, the valve position In the previous period is automatically used.

- Alpha expansion vessel vent VOCs emission rate is deteremined by performance test as 0.00011 lb/hr
- Alpha overflow vent VOCs emission rate is deteremined by performance test as 0.000415 lb/hr
- Beta expansion vessel vent VOCs emission rate is deteremined by performance test as 0.022 lb/hr
- Beta overflow vessel vent VOCs emission rate is deteremined by performance test as 0.006 lb/hr

- Alpha expansion vessel vent benzene emission rate is deteremined by performance test as 0.001545 lb/hr
- Alpha overflow vent benzene emission rate is deteremined by performance test as 0.0005 lb/hr
- Beta expansion vessel vent benzene emission rate is deteremined by performance test as 0.0125 lb/hr
- Beta overflow vessel vent benzene emission rate is deteremined by performance test as 0.0015 lb/hr

Annual totals

Project last run 12/03/2018

Alpha projected annual VOC	9.3 lb/yr
Beta projected annual VOC	167.3 lb/yr
Alpha projected annual bezene	14.3 lb/yr
Beta projected annual benzene	60.6 lb/yr

Annual VOC limit per plant 792.1 lb/yr
Annual benzene limit per plant 507.4 lb/yr

2018 Dec 3th Source Test results

		Run 1	Run 2	Average		Run 1	Run 2	Average
Alpha	Exp Ves VOC as C6, lb/hr	0.00018	0.00004	0.00011	Exp Ves Benzene, lb/hr	0.00015	0.00294	0.001545
Alpha	Overflow VOC as C6, lb/hr	0.00072	0.00011	0.000415	Overflow Benzene, lb/hr	6.50E-04	3.50E-04	0.0005
Beta	Exp Ves VOC as C6, lb/hr	0.019	0.025	0.022	Exp Ves Benzene, lb/hr	0.009	0.016	0.0125
Beta	Overflow VOC as C6, lb/hr	0.007	0.005	0.006	Overflow Benzene, lb/hr	2.00E-03	1.00E-03	0.0015

ABENGOA
NORTH AMERICA
Mojave Solar LLC
42134 Harper Lake Road Phone: 760-308-0400
Hinkley, California 92347

Appendix J

2018 Biological Resources Section of the Annual Compliance Report

Mojave Solar Project
Annual Compliance Report
San Bernardino County, California

2018 Reporting Period

Mojave Solar Project

California Energy Commission (09-AFC-5C)

Biological Resources Conditions of Certification

Biological Resources Section of the Annual Compliance Report

January 1 – December 31, 2018

Reporting Period

Submitted

February 2019

Prepared for:

Mojave Solar LLC

42134 Harper Lake Road

Hinkley, California 92347

Prepared by:

Abengoa Solar Industrial Operations LLC
42134 Harper Lake Road
Hinkley, California 92347

Rowe Ecological Consulting
Phone number: 321-853-5709
sprowe@gmail.com

Table of Contents

Section Page

List of Attachments

1. Introduction

This Biological Resources Section of the Annual Compliance Report (ACR) is provided to the California Energy Commission (CEC) pursuant to the Biological Resources Conditions of Certification (COCs) and Compliance-7 as required by the Mojave Solar Project (MSP) Commission Decision (09-AFC-5; CEC, 2010).

On December 23, 2014, the facility commenced commercial operations. Also on this date, Abeinsa (AEPC) turned the site over to the owner, Mojave Solar LLC, to manage facility operations. From January 2015 through May 29, 2016, monthly compliance reports were submitted to comply with the CEC COCs, while the Chief Building Official's punch list activities were completed. The CEC issued the Final Certificate of Occupancy on May 29, 2016 when installation of all permanent equipment and structures was completed. MSP has been in the Operations and Maintenance (O&M) phase of the project as of May 30, 2016. This report covers O&M from January 1 to December 31, 2017.

2. Annual Report Requirements

Annual reporting requirements during O&M are only referenced in BIO-2, BIO-6, BIO-16, and BIO-17; however, this ACR addresses all Biological Resource COCs (BIO-1 to BIO-21) because BIO-6, the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), covers all Biological Resource COCs.

3. Mitigation Measures

Table 1 provides a list of the Biological Resource COCs covered in the BRMIMP.

Table 1
BRMIMP Mitigation Measures

COC	**Brief Description of Condition**
BIO-1	Designated Biologist Selection
BIO-2	Designated Biologist Duties
BIO-3	Biological Monitor Selection, Qualifications, and Duties
BIO-4	Designated Biologist and Biological Monitor Authority
BIO-5	Worker Environmental Awareness Program
BIO-6	Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) Development and Compliance
BIO-7	Impact Avoidance and Minimization Measures
BIO-8	Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Migratory Birds
BIO-9	Golden Eagle Territory-Specific Management Plan
BIO-10	Documentation of Bald and Golden Eagle Act Compliance
BIO-11	Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan

Table 1 BRMIMP Mitigation Measures	
COC	**Brief Description of Condition**
BIO-12	Mohave Ground Squirrel Clearance Surveys
BIO-13	Burrowing Owl Impact Avoidance, Minimization and Mitigation Measures
BIO-14	American Badger and Desert Kit Fox Impact Avoidance and Minimization Measures
BIO-15	Compensatory Mitigation
BIO-16	Tamarisk Eradication, Monitoring, and Reporting Program
BIO-17	Monitoring Impacts of Solar Collection Technology on Birds
BIO-18	Common Raven Monitoring, Management, and Control
BIO-19	Evaporation Pond Monitoring and Adaptive Management Plan
BIO-20	Harper Dry Lake Marsh Water Delivery
BIO-21	USFWS Biological Opinion

3.1 BIO-1: Designated Biologist Selection

BIO-1 requires the project to select a Designated Biologist (DB) to effectively implement the duties in BIO-2 and other relevant COCs. Approved DBs, Gerald Monk and Sean Rowe performed the duties of DB on the project site during the 2018 reporting period. The qualifications for Gerald Monks and request for DB approval was submitted (under BIO1-16-00 submittal) (CEC, USFWS and CDFW) to the permitting agencies in December 2016, and Mr. Monks was subsequently approved January 5 (USFWS and CDFW) and January 6 (CEC), 2017 as a DB and desert tortoise Authorized Biologist under the project specific Biological Opinion 8-8-11-F-3 (USFWS, 2011B). The qualifications for Sean Rowe and request for DB approval was submitted (under BIO1-19-00 submittal) (CEC, USFWS and CDFW) to the permitting agencies in March 14, 2018, and Mr. Rowe was subsequently approved March 21 (USFWS and CDFW) and March 27 (CEC), 2018 as a BM, Authorized Avian Specialist and desert tortoise Authorized Biologist under the project specific Biological Opinion 8-8-11-F-3 (USFWS, 2011B). Mr. Rowe was subsequently approved as DB on October 12, 2018.

3.2 BIO-2: Designated Biologist Duties

An approved DB was onsite or otherwise available during all O&M activities. The DB advised on compliance with Biological Resource COCs, supervised and conducted biological resource compliance inspections, surveyed sensitive biological resource areas, notified the project owner and the CPM of noncompliance events, responded to CPM inquiries, and maintained compliance records. One Biological Monitor was employed at MSP during the reporting period. During O&M, the DB provided the CPM with written monthly reports for the Evaporation Pond Plan (as required by BIO-19) and took part in the implementation of the BIO-17 Bird Monitoring Study.

3.3 BIO-3: Biological Monitor Selection, Qualifications, and Duties

BIO-3 allows the project to utilize approved Biological Monitors to assist the DB. One Biological Monitor, Sean Rowe, was employed during the reporting period (for the BIO17 Bird Monitoring Study and for BIO19 activities, mainly).

3.4 BIO-4: Designated Biologist and Biological Monitor Authority

BIO-4 provides the DB and BM authority to halt construction activity in areas specified by the DB if that activity were to potentially harm biological resources or is in violation of any state or federal laws, conditions, permits, or other such agreements made to applicable agencies.

No construction activities took place during the reporting period.

3.5 BIO-5: Worker Environmental Awareness Program

BIO-5 requires that the project owner develop and implement a Worker Environmental Awareness Program (WEAP). On October 22, 2015, the project owner submitted a revised BIO-5 WEAP training for use during operations (MSP, 2015a). The CPM approved the training program for operations on November 17, 2015. On December 9, 2015, the CPM approved immediate use of the operations WEAP for annual refresher training for operations personnel, while still in the construction period. On June 15, 2018 MSP submitted a new version of the BIO5 WEAP training for review and approval. The CEC CPM approved it on June 15, 2018.

The WEAP was provided to all new employees, contractors, and subcontractors within a week of hiring new workers and annually for ongoing workers.

3.6 BIO-6: Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) Development and Compliance

BIO-6 requires the project owner to develop and implement a BRMIMP, which covers all Biological Resource COCs as reported herein. BIO-17 (Bird Monitoring Study) was subsequently approved by the CPM on January 27, 2017. BIO-19 (Evaporation Pond Monitoring and Adaptive Management Plan) was resubmitted to the CPM and USFWS in December 2016. Final BIO19 Evaporation Pond Plan, BIO19-00-08 Evaporation Pond Monitoring and Adaptive Management Plan, Rev. 6. (Mojave Solar Project 09-AFC-5C) submittal approved on March 8, 2017, in consultation with the USFWS, CDFW, and Regional Water Quality Control Board (RWQCB), it will be incorporated into the BRMIMP as Appendix I. See Sections 3.17 and 3.19 for more details.

3.7 BIO-7: Impact Avoidance and Minimization Measures

BIO-7 requires the project owner to implement seventeen measures to avoid or minimize impacts to local biological resources, several of which overlap with other COCs and are thus addressed separately. The majority of measures addressed in BIO-7 are construction related and were largely not relevant during this reporting period, with the exception of Harper Lake Road pavement maintenance. The project owner, with support from the DB, ensured compliance with BIO-7 during pavement maintenance operations.

3.8 BIO-8: Nest Surveys and Impact Avoidance and Minimization Measures for Migratory Birds

BIO-8 requires impact avoidance and minimization measures for birds protected under the Migratory Bird Treaty Act (MBTA). Nest surveys were conducted by the DB onsite for any activities with the potential to effect MBTA-protected bird nests. Nesting surveys were performed in accordance with the procedures set forth in BIO-8. Eight active nests were discovered and monitored during this reporting period. No entry buffers were established around active nests and nests were monitored until nestlings fledged or dispersed or nests were otherwise determined inactive. Of the 8 nests, 7 (6 American Avocet and 1 Black-necked Stilt) were associated with the evaporation ponds. Of the 6 avocet nests, at least 3 successfully fledged young. Avocet young were seen at the Beta ponds, but it was not possible to determine if they resulted from one or both active nests. The single Black-necked Stilt nest also successfully fledged young. A Common Raven (*Corvus corax*) pair initiated a late nesting attempt in the Alpha power block, but this nest was later abandoned.

Species	Nest ID	Discovery Date	Location	Outcome
American Avocet	01-A-AMAV	5/2/18	Alpha Evaporation Ponds	Depredated
American Avocet	02-A-AMAV	5/2/18	Alpha Evaporation Ponds	Fledged Young
American Avocet	03-A-AMAV	5/15/18	Alpha Evaporation Ponds	Fledged Young
American Avocet	04-A-AMAV	5/21/18	Alpha Evaporation Ponds	Abandoned
Common Raven	05-A-CORA	5/22/18	Alpha Power Block	Abandoned
American Avocet	01-B-AMAV	6/20/18	Beta Evaporation Ponds	Unknown – possibly fledged young
American Avocet	02-B-AMAV	6/20/18	Beta Evaporation Ponds	Unknown – possibly fledged young
Black-necked Stilt	03-B-BNST	6/20/18	Beta Evaporation Ponds	Fledge Young

3.9 BIO-9: Golden Eagle Territory-Specific Management Plan

BIO-9 requires that the project owner conduct Golden Eagle (*Aquila chrysaetos*) surveys and prepare a plan if an occupied territory is found within 10 miles of the project site.

On January 28, 2011, USFWS approved the project owner's findings that no Golden Eagles were located within 10 miles of the project site, and therefore, the project owner did not need to prepare a BIO-9 Golden Eagle Plan. On March 14, 2011, the project owner submitted USFWS's findings to CEC (MSP, 2011a). On March 17, 2011, CEC approved USFWS' letter satisfying the BIO-9 requirement.

3.10 BIO-10: Documentation of Bald and Golden Eagle Act Compliance

BIO-10 requires the project owner document compliance with the Bald and Golden Eagle Protection Act, if required by the BIO-9 survey results.

On March 17, 2011, the CEC via email stated that since a BIO-9 Golden Eagle Plan was not required that the project owner had also met BIO-10 compliance requirements.

3.11 BIO-11: Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan

One adult female Mojave Desert tortoise was encountered on the MSP site in 2017 and released for adoption during the current reporting period. On Sunday, October 1, 2017, MSP staff notified the DB that a desert tortoise had been observed near the Alpha Administration Building parking lot. The DB was at the site within 20 minutes and captured the tortoise.

An initial health assessment showed the tortoise to be alert, active, and slightly underweight, with the presence of mucous around the nostrils. The tortoise was taken to the DB's office and soaked in 1" of water for 40 minutes in an attempt to rehydrate it. All participating agencies were alerted immediately.

After the tortoise was secured, the DB performed a preliminary survey of the tortoise fences and guards in the immediate vicinity of capture. No issues were observed. A complete inspection of the MSP tortoise fences and guards was performed by MSP staff the next day and no breaches were reported.

Formal health assessment of the tortoise was performed by Brian Sandstrom of Ironwood Consulting on October 10. Signs of old carapace and plastron damage were observed and recorded, however the tortoise was deemed healthy enough to be housed on site pending agency review and recommendation. Blood and plasma samples were extracted as was an oral swab. Samples were sent to the San Diego Zoo and University of Florida labs for analysis.

Blood analysis revealed that the respiratory disease *Mycoplasma agassizii*, is present in tortoise MSP-001. Participating agencies were notified. Ray Bransfield of USFWS notified the DB via phone that the tortoise was to remain on site pending an interagency letter that will recommend it be placed into adoptive care with the California Turtle and Tortoise Club. MSP received the USFWs' letter on February 26, 2018. The tortoise was transferred to the California Turtle and Tortoise Club for adoption in March 2018.

On October 13, 2018, the BM discovered a juvenile tortoise inside the MSP perimeter fence. The DB captured the tortoise and transported it to the DB's office where it was hydrated and housed. The tortoise was estimated at just under 2" carapace length, appeared healthy and showed no sign of disease or injury. The DB surveyed the vicinity of where the tortoise was discovered and found no burrows or evidence of how the tortoise entered the facility perimeter. The DB notified agencies and requested guidance on disposition. The tortoise was released on October 15, 2018 per email from Ann Crisp with concurrence from other agency staff. It was released outside the MSP perimeter approximately 280m southwest of the discovery location.

All permanent desert tortoise exclusion fencing was inspected monthly and during/immediately after major rainfall events.

No desert tortoises were translocated or transmittered during this reporting period.

3.12 BIO-12: Mohave Ground Squirrel Clearance Surveys

BIO-12 requires the project to avoid or minimize impacts to Mojave ground squirrel by conducting a clearance survey once the desert tortoise exclusion fence is completed (BIO12-02-0, November 18, 2011).

No other Mohave ground squirrels were observed on the site, therefore no handling, capturing, or relocation was necessary for the duration of this reporting period.

3.13 BIO-13: Burrowing Owl Impact Avoidance, Minimization and Mitigation Measures

BIO-13 requires preparation of Burrowing Owl (*Athene cunicularia*) Monitoring and Mitigation Plan to avoid and minimize impacts to burrowing owls in and near construction areas (if identified during the surveys). Last survey performed and approved on January 26, 2011 BIO13-02-01.

No Burrowing Owls were observed on the site during the reporting period. Due to the project having entered the O&M phase, no specific Burrowing Owl surveys were conducted (BIO17 initial survey conducted on September 2017).

3.14 BIO-14: American Badger and Desert Kit Fox Impact Avoidance and Minimization Measures

BIO-14 requires pre-construction surveys and provides guidance on preconstruction encounters with American badgers and desert kit fox. The MSP site is currently monitored for the presence of desert kit fox and American badger by the DB via observation of tracks, scat, and examination of burrows on or around the site. No signs of American badger have been observed during this reporting period. Kit foxes are ubiquitous in the area and often traverse or reside on site in undisturbed areas.

Desert kit fox den site #9, located in east of the solar collector field in Alpha East, was active during this reporting period. A game camera documented continued use of the den until June after which time it was abandoned. The den site remained inactive until December when the activity was documented by the game camera and recent sign was observed around the den site. An exclusion buffer was established and maintained around the den to prevent disturbance. This den will continue to be monitored by the DB. No other den sites have been observed on the premises. Fox tracks and scat were regularly observed across the site and game cameras involved with the BIO-17 avian mortality study regularly capture foxes scavenging on trial specimen carcasses.

3.15 BIO-15: Compensatory Mitigation

To fully mitigate for habitat loss and incidental take of desert tortoise and Mohave ground squirrel as well as burrowing owl, BIO-15 requires the project owner, in fee or in easement, to acquire 118.2 acres of land suitable for desert tortoise, Mohave ground squirrel, and burrowing owl and fund the enhancement and long-term management of these compensation lands.

Compensatory mitigation was satisfied and approved by CEC between 2011 and 2014. On July 19, 2016, to address the final requirement of COC BIO-15, the project owner submitted BIO15-06-00, confirming that project construction was limited to the area described in the Commission Decision, therefore, disturbance to desert tortoise and MGS habitat did not exceed 430 acres, and

construction activities did not impact desert tortoise, MGS, and burrowing owl habitat adjacent to work areas. The CPM approved the submittal for Verification of Habitat Disturbance Area on September 15, 2016, which was the final requirement related to this COC.

The Transition Habitat Conservancy (THC) acquired 234 acres of land near MSP in 2014 to satisfy the compensatory mitigation requirements of BIO-15. THC manages and monitors these lands in perpetuity to ensure habitat for desert tortoise, burrowing owl and Mojave ground squirrel is not degraded. THC also works in partnership with the Bureau of Land Management to BLM lands that impact THC mitigation properties.

In 2018 THC continued monitoring, habitat restoration, improvement and research on parcels associated with MSP mitigation as well as other THC parcels in the vicinity. These activities included tortoise surveys, installation of signage, restoration of OHV incursions, implementation of habitat restoration (rainfall collectors and enhancing native forage) and public outreach and law enforcement patrols through the San Bernardino County Sheriff's Department. During systematic tortoise surveys THC located a "hotspot" on MSP mitigation parcels that contained the highest density of tortoise sign of any THC lands and documented at least five live tortoise, including on juvenile, and numerous active burrows.

3.16 BIO-16: Tamarisk Eradication, Monitoring, and Reporting Program

BIO-16 requires the project owner to prepare and implement a Tamarisk (*Tamarix ramosissima*) Eradication, Monitoring, and Reporting Plan to ensure the effective removal of tamarisk and other weed species. There are two definitions of weed species provided by the Tamarisk Plan, the Staff Assessment, Commission Decision, and guidance provided by CEC staff biologist Ann Crisp via email on May 28, 2014: invasive and exotic. Invasive species are defined as having a California Invasive Plant Council's (Cal-IPC) "high" or "moderate" rating. Exotic species include species on the Cal-IPC list but that do not have an overall rating of "moderate" or "high".

Per BIO-16, invasive weed species must be eradicated from the site for at least three years for the condition to be deemed successful and exotic weed species must have less than 5 percent cover of MSP to meet its success criteria goals.

Weed surveys were performed in spring of 2016 prior to the end of the Construction Period. These surveys resulted in the presence of three invasive species [red brome (*Bromus madritensis* ssp. *rubens*), hare barley (*Hordeum murinum* ssp. *leporinum*), and London rocket (*Sisymbrium irio*)] and four exotic species [redstem filaree (*Erodium cicutarium*), barbed wire Russian thistle (*Salsola paulsenii*), Russian thistle (*S. tragus*), and Mediterranean grass (*Schismus arabicus*)]. As previously stated, the definition of exotic and invasive plant species is based on Cal-IPC ratings; however, there remains the potential for additional nonnative plant species to occur on the site that are not native in California and not on the Cal-IPC list. Two of these species were present on site at the end of construction in 2016: cheeseweed (*Malva parviflora*) and nettle-leaved goosefoot (*Chenopodium murale*). Although these species do not meet the definition of exotic as previously defined, they have been and will continue to be treated like other exotic plant species.

One invasive species that meet this definition was observed at MSP during this reporting period:

- Saltcedar (*Tamarix ramossisima*)

According to condition BIO-16, these species, and others with an overall Cal-IPC ranking of high or moderate must be eradicated from the site for at least three years for the condition to be deemed successful. There was one seedling near the Beta cooling tower that the biologist removed by hand.

Three plant species were observed during this reporting period that meet the exotic species definition:

- Russian thistle (Salsola tragus),
- Heron's bill (Erodium cicutarium) and
- Mediterranean grass (Schismus arabicus),

All of these species are included on the Cal-IPC invasive plant inventory database and have an overall rating of "limited."

MSP has contracted with a California-licensed herbicide applicator and has been applying herbicide to exotic and invasive species within the project approximately every six months. Herbicide application has shown to be effective in controlling weeds onsite. During 2018 post-emergent herbicide was applied during spring and pre-emergent during fall.

3.17 BIO-17: Monitoring Impacts of Solar Collection Technology on Birds

BIO-17 requires the project owner to develop and implement a Bird Monitoring Study.

Revision 2 of the Bird Monitoring Study was submitted to the CPM on April 15, 2016, to address comments on Revision 1 provided by the CEC staff during a January 27, 2016 meeting. A meeting was held on December 14, 2016 between MSP and CEC to discuss, in part, consistency between the BIO-17 Bird Monitoring Study and BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan. The Bird Monitoring Study was subsequently approved by the CEC on January 27, 2017.

The issuance of the permanent Special Purpose Utility Permit by the USFWS was received on March 3, 2017 and the Scientific Collection Permit from the CDFW was received on August 10, 2017. The late receipt of the latter permit pushed back initiation of the study by two quarters. These two quarters are to be added to the 2019-2020 seasons.

The BIO-17 Bird Monitoring Study was initiated on September 1, 2017 and is currently ongoing. MSP has contracted Ironwood Consulting and Corvus Biological to provide an avian mortality surveyor, data management and analysis services, and to consult on the overall implementation of the study.

The DB performs all aspects of the carcass persistence trials and searcher efficiency trials, managing the carcass and game camera placement. Currently, 18 biologists are being added to the site's Scientific Collecting Permit, plus the Principal Investigator. Please see BIO17-01-02 SCP (09-AFC-5C) for further information.

Avian Mortality surveys have been ongoing since September 2017. Quarterly reports have been submitted quarterly beginning February 28, 2018.

Total number of avian fatalities on the MSP site during the 2018 reporting period (Including BIO-19/ Evaporation Pond related deaths) amount to 170.

Only one injured bird was found on the MSP site during 2018. An apparently injured Mourning Dove was found near the perimeter fence on May 03, 2018. The bird appeared stunned or disoriented, possibly due to collision but otherwise showed no obvious signs of injury. It was released alive later the same day at the nearby Harper Lake ACEC wetland.

3.18 BIO-18: Common Raven Monitoring, Management, and Control Plan

BIO-18 requires the project owner to implement measures to manage its construction site in a manner to control Common Raven (*Corvus corax*) populations. In addition, the project owner must develop and implement a Common Raven Monitoring, Management, and Control Plan. BIO18-01-03 reviewed and approved by the CEC on March 26, 2012.

The final BIO-18 raven plan includes 7 point count stations at specified locations for O&M. The revised point count locations for O&M were submitted to the CPM, USFWS, and CDFW and were approved on June 24, 2016. Per the plan, point counts are required to be conducted monthly. Table 1 contains dates, station number and number of birds recorded. Attachment 1 includes Raven Point Count spreadsheet with all associated information.

Summary of Common Raven Point Count Observations				
Date	**Station**	**Number of Ravens Observed**	**Location Description**	**Activity Observed**
1/25/2018 AM	4,6	2		Flying
1/25/2018 PM		0		No Observations
2/27/2018 AM		0		No Observations
2/27/2018 PM		0		No Observations
4/25/2018 AM	4	2	SCA, Light Pole	Flying, Perched
4/24/2018 PM	2,5,7	3	Power Block, Sandlot Substation, Gen-tie	Flying, Perched
5/30/2018 AM	1,7	6	SCA, Ground	Flying, Perched, Walking
5/30/2018 PM	2,3,7	4	Power Block, Ground	Flying, Perched, Walking
6/19/2018 AM	2,4,7	4		Flying
6/19/2018 PM	3,6	3	Power Pole	Flying, Perched
7/24/2018 AM	4,6	4	SCA, Ground, Power Pole	Flying, Perched, Walking
7/24/2018 PM	2	1		Flying
8/21/2018 AM	5	1	SCA	Perched
8/21/2018 PM	6	1	Power Block	Perched
9/26/2018 AM	2,4,6,7	5	Power Pole, Fence,	Flying, Perched,

			Ground, Tamarisk	Walking
9/25/2018 PM	1,2,6	6	Power Pole	Flying, Perched
10/12/2018 AM	3,4,5	3	Power Pole	Flying, Perched
10/12/2018 PM	2,3,5,6	5	Power Block, Power Pole	Flying, Perched
11/30/2018 AM	3,4,5,6	9	Power Pole	Flying, Perched
11/30/2018 PM	5	1		Flying
12/19/2018 AM	2,3,7	7	Power Pole	Perched
12/19/2018 PM	1	1		Flying

3.19 BIO-19: Evaporation Pond Monitoring and Adaptive Management Plan

BIO-19 requires the project owner to develop and implement an Evaporation Pond Monitoring and Adaptive Management Plan to define the monitoring and reporting procedures as well as triggers for adaptive management strategies that will be implemented to prevent wildlife fatalities at the evaporation ponds.

The BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan was submitted to CEC and USFWS on February 23. On September 16, the CPM notified MSP that the submittal was not approved. Per CPM recommendations MSP requested for approval on September 27 to redeploy the cannon deterrents in addition to changing the chip card and keeping the Eagle Eyes™, periodically rotating implementation of these technologies. MSP also proposed installing a water cannon system with high flow in all the ponds to hinder the birds from finding a proper spot in the ponds for perching or staying on the water. After observing the effects of the current evaporators in use at the Alpha ponds, this seems to be a working system for bird deterrents. On October 7, the CEC requested information by email on the water cannons; how many cannons per pond, how would they be triggered to go off, and which particular type of cannon would be installed. On October 11, MSP sent an email response to CEC stating there would be 2 to 6 cannons deployed per pond, depending on final model and layout. They would go off automatically, and would most likely be similar to the Landshark™ model.

A meeting was held on December 14, between MSP and CEC to discuss, in part, the proposed Evaporation Pond and Adaptive Management Plan. Topics discussed were: operation schedule of the water cannons, time of year cannons are to be used, would cannons affect existing evaporators, water flow rates, power source, how many cannons per pond, how they would be turned on, and brand or model type. An email was sent by MSP on December 21 answering all the questions the CEC had from the meeting. There was no final decision made by the CPM by the end of December 2016; therefore, the current approach is as follows: if the adaptive management from a prior quarter's trigger has not yet been implemented, and the trigger is met the subsequent quarter, no additional adaptive management measure would be implemented until the first one is implemented (MSP 2016. BIO-19. Section 4-2).

On September 5, 2017 the adaptive management trigger was met with the discovery of a bird carcass in the Beta Evaporation Pond. Water cannon materials were ordered, and a contractor retained for the construction and deployment of the cannons. The contractor never came to the site and could not be contacted which caused a delay in the deployment of the cannons. An irrigation supply and rental company was contacted to provide a water cannon replacement.

On October 11, 2017, the water cannons were finally deployed and activated. As part of the adaptive management guidelines, daily avian point counts were initiated. During one of these point counts, an injured red-necked phalarope was discovered in the pond. No cause for the injury could be verified, but the DB suspected a possible collision by the bird with one of the water cannon streams. On October 10, 2017, a dead red-winged blackbird was discovered directly under one of the water cannon streams. The carcass showed definite signs of trauma evidenced by a broken neck and missing feathers in the pectoral region. The DB notified the agencies of the find immediately.

On October 26, 2017, the CEC issued a Cease and Desist order on the use of the water cannons. The water cannons were immediately shut off that day and were returned to the rental company some weeks later.

Subsequent consultation with the CEC and USFWS resulted in the recommendation to keep the Bird Gard and Eagle Eyes deterrent systems in place. Additional avian fatalities on October 16 and 17 2017 resulted in the final adaptive management trigger being met. On, January 23, 2018, the CEC issued a formal letter notifying the MSP that the ponds must be netted. USFWS concluded that the installation of the netting should be delayed for a period of one year to do a comparative study with the netting system at the Genesis solar site.

Avian point counts were reduced to a bi-weekly schedule for the time being, at the request of the CEC.

3.20 BIO-20: Harper Dry Lake Marsh Water Delivery

BIO-20 requires the project owner to provide a well with the ability to convey a minimum of 75 acre-feet of water to Harper Dry Lake marsh, prior to decommissioning the on-site well that was serving the marsh.

On August 16, 2012, the project owner completed construction of a new well that meets BIO-20 criteria of providing 75 acre-feet of water to the Harper Dry Lake marsh. In letter to the project owner, the Bureau of Land Management took responsibility for well ownership, including maintenance and electricity. In compliance with the BIO-20 Verification, the project owner submitted all applicable information regarding decommissioning the original well and specifications of the new well to the CPM on September 24, 2012 (MSLLC, 2012).

As noted in the BIO-6 Construction Closure Report, this item was completed in 2012 and no further compliance activities are required related to this COC.

3.21 BIO-21: USFWS Biological Opinion

BIO-21 requires the project owner to incorporate the USFWS's Biological Opinion terms and conditions into the BRMIMP.

The USFWS issued the Biological Opinion (8-8-11-F-3) on March 17, 2011 (USFWS, 2011b).

As referenced in the BIO-11 section, one adult female Mojave Desert tortoise was encountered on the MSP site in 2017 and released for adoption during the current reporting period and one juvenile tortoise was discovered onsite on October 13 and released offsite on October 15, 2018. BIO21-06-00 Biological Opinion Annual Compliance Report 2018 (09-AFC-5C) submitted on December 13, 2018.

4 References.

Abengoa Solar, Inc. (Abengoa). 2009. Application for Certification – Mojave Solar Project. August.

AECOM. 2009. Evaporation Pond Monitoring/Remedial Action Plan, Mojave Solar Project, Attachment DR-69 - Evaporation Pond. Prepared for Mojave Solar LLC as part of Response to Data Response 69. December.

AECOM. 2011a. Addendum to the Burrowing Owl Mitigation and Monitoring Plan. Prepared for Mojave Solar LLC. March 18.

AECOM. 2011b. Amendment 1 – Desert Tortoise Translocation Plan. [01/25/2011] (CPM approved this on 4/19/11).

AECOM. 2011c. Amendment 2 – Desert Tortoise Translocation Plan. November 28.

AECOM. 2011d. Biological Resources Mitigation and Monitoring Plan (BRMIMP). Prepared for Mojave Solar LLC. March 21.

AECOM. 2011e. Burrowing Owl Monitoring and Mitigation Plan. Prepared for Mojave Solar LLC. March 18.

AECOM. 2011f. Desert Tortoise Clearance Survey Report. Prepared for Mojave Solar LLC. July 1.

AECOM. 2011g. Monthly Compliance Report March and April 2011. Prepared for Mojave Solar LLC. June 3.

AECOM. 2011h. Pre-construction Kit Fox, American Badger, and Burrowing Owl Clearance Survey Report. Prepared for Mojave Solar LLC. September 7.

AECOM. 2011i. Revised Addendum for the Burrowing Owl Mitigation and Monitoring Plan. Prepared for Mojave Solar LLC. March 23.

AECOM. 2011j. Tamarisk Eradication, Monitoring, and Reporting Plan. Prepared for Mojave Solar LLC. October 5.

AECOM. 2011k. Worker Environmental Awareness Program (BIO, CUL, and PAL). Prepared for Mojave Solar LLC. March 9.

AECOM. 2012a. Annual Compliance Report for Biological Resources. December.

AECOM. 2012b. Common Raven Monitoring and Control Plan Mojave Solar Project. Prepared for Mojave Solar LLC. March 26.

AECOM. 2012c. Desert Tortoise Clearance Survey Addendum. Prepared for Mojave Solar LLC. April 17.

AECOM. 2012d. BIO-17, Preliminary Draft Bird Monitoring Study. Prepared for Mojave Solar LLC. December 20.

AECOM. 2012e. Request for Approval of Reduced Biological Resource Monitoring at the Mojave Solar Project (MSP). November 21.

AECOM. 2012f. Second Addendum to the Burrowing Owl Monitoring and Mitigation Plan. Prepared for Mojave Solar LLC. January 13.

AECOM. 2013b. Monthly Raven Point Count Surveys. Prepared for Mojave Solar LLC. March 7.

AECOM and Mojave Solar Project (MSP). 2015a. Biological Resources Mitigation and Monitoring Plan (BRMIMP). March 27.

AECOM and MSP. 2015b. Tamarisk Eradication, Monitoring, and Reporting Program. Prepared for Mojave Solar LLC. October 30.

Bloom Biological Inc. 2011. Results of Winter Surveys for Golden Eagles (Aquila chrysaetos). March 16.

California Energy Commission (CEC). 2010. Abengoa Mojave Solar Project Commission Decision CEC-800-2010-008-CMF. September.

CEC. 2011. Abengoa Mojave Solar Project (09-AFC-5C) Authorization to Construct Tortoise Fence at the Project Site. March 21.

CEC. 2012. Notice of Decision by California Energy Commission. August 9, docketed August 17.

CEC. 2014a. Staff Comments on Abengoa's BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan. June 19.

CEC. 2014b. Staff Comments on Mojave Solar Project Bird Monitoring Study (BIO-17). May 12.

CEC. 2014c. Draft EPP CEC comments. November 24.

CH2M HILL. 2013. Mojave Solar Project Biological Opinion Annual Compliance Report December 2012 through November 2013 Reporting Period. Prepared for Mojave Solar LLC. December.

CH2M HILL. 2014. Mojave Solar Project Biological Opinion Annual Compliance Report December 2013 through November 2014 Reporting Period. Prepared for Mojave Solar LLC. December.

CH2M HILL. 2015. Extrapolated Guidance for BIO-14 Desert Kit Fox and American Badger Impact Avoidance and Minimization Measures during MSP Operations. July.

CH2M and Mojave Solar Project (MSP). 2016a. BIO-7 Post-construction Impact Avoidance and Minimization Measures Report. [5/29/2016].

CH2M and MSP. 2016b. BIO-16 Post-construction Tamarisk, Eradication, Monitoring, and Reporting Program Report. [8/25/2016].

CH2M and MSP. 2016c. BIO-18 Post-construction Common Raven Monitoring, Management, and Control Plan Report. [6/29/2016].

CH2M and MSP. 2016d. United States Fish and Wildlife Service's Biological Opinion (8-8-11-F-3) Post-Construction Report. [7/28/2016].

Egan, Thomas B. 2011. Lockhart Ecological Reserve San Bernardino County, California Final Management Plan. June.

Ellison, Schneider, and Harris L.L.P. 2012. Petition to Modify BIO-7's Speed Limitation on Harper Lake Road. March 30.

Ironwood or MSP. 2016. Biological Opinion Annual Report (reporting period, December 2015 through November 2016).

Karl, Alice. 2011. BIO-11 Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan. Prepared for Mojave Solar, LLC.

Leitner, Philip. 2011. Mojave Ground Squirrel Clearance Survey Results. Prepared for Mojave Solar LLC. July.

Mojave Solar Project (MSP). 2011a. BIO-9, USFWS Determination on Golden Eagle Territory-Specific Management Plan. March 14.

MSP. 2011b. BIO-15-03-00, Habitat Mitigation Security Deposit. August 19.

MSLLC. 2012. BIO-20, Decommissioning the BLM Wetlands Well, BIO20-01-00. September 24.

MSP. 2013a. BIO-5, Mojave Solar Project, Proposed Site Escort Policy, 9-AFC-5. January 4.

MSP. 2013b. BIO-17, Draft Bird Monitoring Study. December 16.

MSP. 2014a. Evaporation Pond Monitoring and Adaptive Management Plan. February 3.

MSP. 2014b. BIO-15 Compensatory Mitigation Letter of Credit Return/Release and Completion of COC. November 18.

MSP. 2014c. BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan. October 24.

MSP. 2014c. Evaporation Pond Monitoring Protocols. July 21.

MSP. 2015a. BIO-5, Worker Environmental Awareness Program, Revised. October 22.

MSP. 2015b. BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan. February 13.

MSP. 2015c. BIO-19 Evaporation Pond Monitoring and Adaptive Management Plan. Revision 4.1. March 24.

MSP. 2015d. BIO-19, Evaporation Pond Monitoring and Adaptive Management Plan (revision 4.3). June 26.

MSP, CH2MHILL, and Western Ecosystems Technology, Inc. (West). 2015. BIO-17 Bird Monitoring Study. Prepared for Mojave Solar LLC. August 12.

Transition Habitat Conservancy. 2018. Abengoa Mojave Solar Project Mitigation Property and Edison Sandlot Transmission Upgrade Mitigation Property 2018 Annual Report.

United States Fish and Wildlife Service (USFWS). 2011a. Allowable Interim Actions, Mojave Solar Project, San Bernardino County, California (8-8-11-F-3). Dated March 11, 2011. Letter to Matthew C. McMillen,

Director of Environmental Compliance, Loan Guarantee Program Office, Department of Energy, Washington, D.C.

USFWS. 2011b. Biological Opinion on Mojave Solar, LLC's Mojave Solar Project, San Bernardino County, California (8-8-11-F-3). Dated March 17, 2011. Letter to Matthew C. McMillen, Director of Environmental Compliance, Loan Guarantee Program Office, Department of Energy, Washington, D.C.

USFWS. 2013. Special Purpose Utility Salvage Permit – Solar (MB89555A-0). August 15, 2013 through February 15, 2014.

USFWS. 2014a. Special Purpose Utility Salvage Permit – Solar (MB89555A-1). March 3, 2014 through July 3, 2014.

USFWS. 2014b. Special Purpose Utility Salvage Permit – Solar (MB89555A-1 Amendment). July 3, 2014 through January 3, 2015.

USFWS. 2015a. Special Purpose Utility Salvage Permit – Solar (MB89555A-2 Amendment). February 9, 2015 through July 15, 2015.

USFWS. 2015b. Special Purpose Utility Salvage Permit – Solar (MB89555A-3 Amendment). July 15, 2015 through January 15, 2016.

USFWS. 2016. Special Purpose Utility Salvage Permit – Solar (MB89555A-4 Amendment). January 15, 2016 through December 2017.

Young, Ryan and Ron Walker. 2011. Addendum 1 to Mohave Ground Squirrel Survey Report. Prepared for Mojave Solar LLC. November 18.

Abengoa Solar Industrial Operations LLC , Mojave Solar Project's Annual Compliance Reports 2016-2017.

Attachment 1
Raven Point Count Raw Data (see separate spreadsheet file)

Transition Habitat Conservancy

Abengoa Mojave Solar Project Mitigation Property and Edison Sandlot Transmission Upgrade Mitigation Property 2018 Annual Report

Abengoa Mojave Solar Project Mitigation Property and Edison Sandlot Transmission Upgrade Mitigation Property 2018 Annual Report

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December 2018 Annual Report

In 2017 THC became an Accredited Land Trust by the Land Trust Alliance. This is a national mark of distinction. Accreditation affirms national quality standers are met resulting in sound finances, ethical conduct, responsible governance and lasting stewardship. THC is Authorized to Hold Mitigation Land by the California Department of Fish and Wildlife. This will need to be renewed in 2022.

Exhibit
01 Authorization to Hold Mitigation land by CDFW

The Transition Habitat Conservancy (THC) acquired fee title to 234 acres owned by Solucar Inc., a subsidiary of Abengoa, in August of 2014. This acquisition serves to mitigate for the loss of desert tortoise habitat from the construction of the Abengoa Mojave Solar Project and the transmission upgrades for Edison known as Sandlot. THC manages and monitors the land use of the property in perpetuity in order to detect changes harmful to the habitat values of the property, and to take action when necessary to correct these issues. This mitigation satisfies the following permits:

- **For Mojave Solar: The Abengoa Mojave Solar Project ("AMSP")** in San Bernardino County, California, pursuant to California Energy Commission ("CEC") License Decision CEC-800-2010-008-CMF, dated September 2010 (the "CEC License Decision") (hereinafter "AMSP Requirements")
- **For SCE: Incidental Take Permit No. 2081-2011-055-06 (the "ITP")** issued by the California Department of Fish and Wildlife ("CDFW") for the Special Protection System for the Abengoa Mojave Solar Project ("SPS Project") and Lockhart Substation Project CPUC A.11-05-006, State Clearinghouse Number 2011051041, July 2011 (hereinafter "SPS Upgrade Requirements")

THC has performed the following actions in 2018 to protect the habitat and wildlife values of the property.

I. **Monitor** Property According to THC Monitoring Protocol. Reports are provided to CDFW, Abengoa and Edison. Abengoa provides these reports to the California Energy Commission.
Below are the ***2018 Monitoring results and reports***
Exhibit
01 2018 Annual Land Use and Tortoise Survey for Abengoa MSP & Edison Sandlot
01A Tortoise Hotspot

Overview and Tortoise Habitat Restoration, Improvement and Research

THC owns 4,100 acres of land near the Abengoa and Edison parcels so much of the funding THC receives to upgrade the management of the area is not conducted on the Abengoa parcels, but focused on a holistic approach to improve BLM lands that affect THC lands in a joint collaboration with BLM. Much of the effort expended during 2018 was directed toward setting Hardshell Labs and THC up for future

work. Advances in raven management will have positive effects on our tortoise conservation efforts going forward. Systematizing data recording is essential to capture vital data. Our new ability to permanently mark tortoises will allow us to track and monitor individuals over time. Developing methods for vegetation management will extend our active ecological management abilities.
We did make significant progress:

- **In the course of systematic parcel search we found a second "hotspot" for live tortoises on the Abengoa/Edison parcels used for mitigation for MSP and for Edison's Sandlot ITP. The new hotspot is immediately west of the Harper Dry Lake solar site and is among the farthest south THC parcels. *It has the highest density of sign of any land covered so far.* In four days of fieldwork we saw a minimum of four live tortoises, one of which was a juvenile, and clear sign of another large immature individual. We also found 34 tortoise burrows and the same number of scat.**

- In accord with a USFWS permit to handle tortoises we permanently marked the first two THC tortoises, both adult males in the aforementioned hotspot. We used six-page forms, with much detail on health aspects, to record information about the tortoises.
- Trained the third Americorps volunteer crew to recognize tortoise sign and use the iPad app to record information. They succeeded in adding observations of several live tortoises and carcasses to the data base.
- Focused on setting up an information recording protocol with the creation of a master spreadsheet that combines physical data and coverage information for all parcels. The resulting spreadsheet is included as a separate file and submitted with this report.
- On separate projects HSL continued development and testing of raven management technology including remote egg-oiling techniques to eliminate raven reproductive success and remotely fired lasers for repelling ravens from high value tortoise habitat. Our goal is to add these methods into an integrated tortoise conservation program on THC lands.
- The award of a second grant from Patagonia for the construction, placement and monitoring of rainfall concentrators is a first step into vegetation management. It will allow us to gain experience enhancing availability of high quality food for tortoises.

Work in the immediate Fremont-Kramer Tortoise Recover Unit #1 Area Funded by Initial Management funds and other Funds in a holistic approach to management of the area

II. Restoration and signing on THC and BLM Lands using OHV Commission Grant funds, AmeriCorps Crews, Southwest Conservation Corps Teams and san Bernardino County Sheriffs patrol with funds provided by others.

In 2017 THC received a Grant from the State Parks OHV Division grants for **$350,000** for Restoration, signing, outreach, kiosks, brochures and law enforcement **to be used over a 3 year period. 2018** was year one for that grant. Restoration and signing are occurring on BLM land and THC land. THC and BLM have improved coordination and implementation of this work. THC continues to have a full time staff Ranger presence, sign the area, install informational Kiosks, erect fencing of staging areas and problems spots, perform public outreach and have regular law enforcement patrols by hiring San Bernardino Sheriffs Officers to patrol every other weekend in DWMA, for a total of 18 weekend days with 2-4 sheriffs each day. $100.000 was spent on Sheriff's patrol in 2018.
Exhibit

AmeriCorps Crew- Over the course of 1514 person hours in the field, the crew installed rainwater collectors and monitored for tortoises in addition to the time they spent restoring incursions in our polygon system.

AmeriCorp Restoration Results

- 2 polygons
- 28 incursions
- 1.16 miles (1,860 meters) of trail
- 3,296 square meters

Exhibit
O2 AmeriCorps 2018 Restoration Report
02A AmeriCorps 2018 Restoration hours
03 SWCC 2018 Restoration Report

ACE Team Restoration Results

BLM Ridgecrest has an annual commitment from an ACE (American Conservation Experience) crew to help them restore incursions that depart from the legal route system and this year, they happen to be working in the region that contains our properties. When our Americorps crew was pulled from our project to help out with disaster recovery, we jumped on the opportunity to utilize the ACE crew because or goals and objectives were aligned.

We've been taking a systematic approach to tackling incursions in the Desert Wildlife Management Area by tracing illegal routes from our parcels to their origins on legal routes and attempting to cover these tracks up to discourage further trespass and damage to the habitat on our property. Once these incursion sites had been identified, we were left with a map of restoration points along the legal route system. This layer was added to the existing work-plan map for the Ridgecrest ACE crew to see what overlap already existed in our plans and where the ACE crew could assist us.

On the attached map- Green Lines - Legal Routes; Rectangles - THC Parcels; Red Lines - ACE planned incursions; Yellow Stars - THC planned incursions (with restoration direction)
Exhibits
04 ACE Crew restoration map

Tortoise Surveys and Plans

- **Overview**
  Much of the effort expended during 2018 was directed toward setting Hardshell Labs and THC up for future work. Advances in raven management will have positive effects on our tortoise conservation efforts going forward. Systematizing data recording is essential to capture vital data. Our new ability to permanently mark tortoises will allow us to track and monitor individuals over time. Developing methods for vegetation management will extend our active ecological management abilities. We did make significant progress:
- **Desert Tortoise Food Gardens**
  The award of a grant from Patagonia for the construction, placement and monitoring of rainfall concentrators is a first step into vegetation management. It will allow us to gain experience

enhancing availability of high quality food for tortoises. The report from this effort is detailed and summarized in the exhibits.

Exhibits

05 Continuing Tortoise Survey Report
05A New Tortoise hotspot
06 DTNFG 2018 Report
06A DTNFG 2018 Update report

III. San Bernardino County Sheriff's Department Patrol Reports

$100,000 was spent on law enforcement form the OHV Grant. See reports.

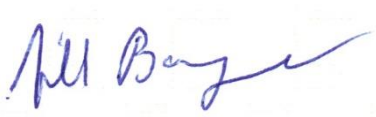
Exhibit
07 2018 Sheriff Reports
08 Signing, Restoration and Restrictor Strategy
09 2017 – 2020 OHV Grant Agreement 3 Year Restoration Grant

IV. Financials

THC was able to leverage funding from several sources in addition to the mitigation land endowment payout in order to accomplish all of this work in the Fremont Region. Thanks to our AmeriCorps Crew of 10 people for 12 weeks (Grant), our OHV Restoration Grant and close collaborations with CDFW, BLM, Fort Irwin, USFWS, plans are being formulated and implemented to give a general uplift to all lands in the region. THC had Audited Financial Statements produced by an independent CPA and those are attached. In 2017 renewal for Authorization to Hold Mitigation Lands from CDFW was renewed until 2022 and the authorization is attached. THC's financial position is strong.

Exhibits
10 990 2017 THC Tax Return
11 Audited Financial Statements by Independent CPA
12 THC Authorization to Hold Mitigation lands
13 2018 Endowment Performance

Sincerely Yours,



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