



April 6, 2023

Board of Directors  
Ventura Regional Sanitation District  
Ventura, California

**APPROVE, AND AUTHORIZE THE BOARD CHAIR TO SIGN, PROPOSED VRSD CONTRACT NO. 23-001 WITH PF ENGINEERS, LLC, FOR LANDFILL CONSULTING SERVICES IN AN AMOUNT NOT TO EXCEED \$28,350**

**RECOMMENDATIONS**

- A. Approve, and Authorize the Board Chair to sign, proposed VRSD Contract No. 23-001 with PF Engineers, LLC for landfill consulting services in an amount not to exceed \$28,350; and
- B. Authorize a budget appropriation of \$28,350 from the Toland Fund.

**FISCAL IMPACT**

The cost for services for this consulting contract was not included in the FY 2022-23 Budget and will therefore require a budget appropriation from fund balance of the Toland Fund (01-300-52080) if it is to be approved and funded by your Board.

**BACKGROUND/ANALYSIS**

The Toland Road Landfill is engineered with a Landfill Gas (LFG) Collection System (LFGCS) to handle LFG formed when buried municipal solid waste decays. The LFGCS collects and routes the LFG to a flare which burns or destructs the LFG, which is primarily methane – a global warming air pollutant. In accordance with federal, state, and local air quality regulations, the LFGCS and flare work in tandem to prevent greenhouse gasses from entering the atmosphere and causing climate change.

District staff has been evaluating alternative uses for the LFG such as repurposing it as a fuel source rather than destroying it by burning it off in the flare. Based on the current market for the price of fuel gas, it is believed that a project which uses the supply of LFG as a fuel source for potential energy production or other feasible end use may result in positive net revenue for the District.

More specifically, District staff has learned that there are various ways that a renewable natural gas (RNG) facility could be employed to capitalize on the LFG produced at the Toland Road Landfill. For instance, the District could either act as a general contractor

and construct, own, and operate a RNG facility or lease a portion of the Toland Road Landfill property to another entity who would then construct, own, and operate the facility with lease and LFG royalty payments to the District. Firms involved in the RNG business structure their projects in different ways depending on the project and the prevailing RNG market.

District staff plans to formally request firms to propose their project characteristics to the District so that there can be a thorough and careful evaluation of any qualified bids or proposals received. Only then will the District be able to determine the proposer who can provide the maximum value or benefit to the District while contemporaneously considering the level of risk to the District.

### **PROPOSAL**

After contacting various consultants who have experience with projects of this nature, District staff has determined that PF Engineers, LLC, based out of Colorado, would be the best firm to assist District staff to develop an RFP and to evaluate the proposals received. PF Engineers has experience developing and evaluating RNG projects throughout the Western United States, including California.

Therefore, District staff negotiated a scope of services and fee with PF Engineers, LLC, to prepare a Request for Proposals (RFP) and assist District staff to evaluate the proposals received in response to the RFP. PF Engineers, LLC would act on behalf of the District as its technical expert to develop the RFP for the LNG project. Following receipt of the proposals, PF Engineers, LLC would assist staff in its evaluation of the projects for eventual presentation to the VRSD Board for a final decision.

Ventura Regional Sanitation District Resolution No. 89-13 provides for negotiated procurement with consultants under Part IV. In particular, under Section 403 of Part IV, consultant contracts may be entered into by negotiated procurement approved by the Board of Directors where compelling economic or administrative considerations warrant employment of alternate consultant selection procedures. These Resolution provisions are consistent with State law requiring Qualifications Based Selection of Professional Services. Therefore, based on the foregoing, District staff recommends that the Board approve Contract No. 23-001 with PF Engineers, LLC.


This letter has been reviewed by Legal Counsel as to form.

If you should have any questions or need additional information, please contact me by phone at (805) 658-4657 or via email at RichardJones@vrzd.com.



RICHARD JONES, DIRECTOR OF OPERATIONS

APPROVED FOR FISCAL IMPACT:

  
\_\_\_\_\_  
Alvertina Rivera, Director of Finance

APPROVED FOR AGENDA:



Chris Theisen, General Manager

- Attachments:
1. Proposed Contract No. 2023-001
  2. CV for Trent Markell of PF Engineers

**VENTURA REGIONAL SANITATION DISTRICT  
CONTRACT NO. 23-001**

**AGREEMENT FOR LANDFILL CONSULTING SERVICES  
BETWEEN  
VENTURA REGIONAL SANITATION DISTRICT  
AND  
PF ENGINEERS**

THIS AGREEMENT is made and entered into this 6<sup>th</sup> day of April, 2023, by and between the VENTURA REGIONAL SANITATION DISTRICT, a public agency/regional sanitation district formed pursuant to California Health & Safety Code Section 4700 et seq. (“DISTRICT”) and PF Engineers, LLC, a Colorado Limited Liability Company (“CONSULTANT”), P.O. Box 382 Berthoud, CO 80513. Together, CONSULTANT and DISTRICT shall be referred to herein as Parties.

**RECITALS**

- A. DISTRICT owns and operates a municipal solid waste disposal facility called the Toland Road Landfill (“Landfill”), located at 3500 Toland Road, Santa Paula, CA 93060.
- B. DISTRICT has a need for a consultant who has specialized knowledge and experience in developing a Request for Proposal (RFP) for the sale of the Toland Road Landfill gas rights to support the installation and operation of a Renewable Natural Gas (RNG) facility at the Landfill.
- C. DISTRICT also has a corresponding need for a consultant who has specialized knowledge and experience in reviewing, assessing, and making recommendations on bids received as part of the aforementioned RFP.
- D. CONSULTANT represents that it has the specialized knowledge, expertise, and experience to provide RFP development and review services to the DISTRICT.
- E. DISTRICT has selected CONSULTANT, based upon the above representations and CONSULTANT-supplied documentation in conformance with the negotiated procurement provisions of Section 403 of the DISTRICT Purchasing Resolution No. 89-13, to provide RFP development and review services for a proposed RNG facility at the Toland Road Municipal Solid Waste Landfill.
- F. Parties agree to enter into this Agreement based upon the valuable and mutual consideration set forth below and the recitals above and to abide by its terms and conditions as set forth herein.

**AGREEMENT**

**ARTICLE 1: WORK STATEMENT/SCOPE OF SERVICES**

- A. CONSULTANT shall provide RFP development and review services to the DISTRICT as more fully described in the STATEMENT OF WORK & RATE SHEET, which is attached as Exhibit “A” to this Agreement and incorporated herein by reference.
- B. CONSULTANT shall use its best professional efforts in providing RFP development and review services to DISTRICT and shall cooperate fully with DISTRICT and provide DISTRICT with all available information and assistance in relation to Exhibit “A.”
- C. CONSULTANT shall begin work, as needed, immediately after the Agreement is signed by both Parties.

- D. All work shall be done in a diligent and professional manner to DISTRICT's satisfaction.

## **ARTICLE 2: TERM OF CONTRACT**

Unless otherwise earlier terminated, this Agreement shall continue in force until the services specified herein have been fully performed. Upon execution of this Agreement by both Parties, CONSULTANT shall diligently pursue work to assure completion on a timely basis. Unless otherwise extended in writing by both Parties, this contract shall automatically terminate on June 30, 2025.

## **ARTICLE 3: INDEPENDENT CONSULTANT RELATIONSHIP**

- A. It is expressly understood between the Parties that no employee/employer relationship is intended, the relationship of CONSULTANT to DISTRICT being that of an independent consultant. DISTRICT shall not be required to make any payroll deductions or provide Workers' Compensation Insurance coverage or health benefits to CONSULTANT.
- B. CONSULTANT is solely responsible for selecting the means, methods, and procedures for performing its services hereunder as assigned by DISTRICT and for coordinating all portions of the work so the result will be satisfactory to the DISTRICT. CONSULTANT will supply all tools and instrumentalities required to perform its services under this Agreement.
- C. CONSULTANT, pursuant to this Agreement, is rendering professional services only and any payments made to it are compensation solely for such services as it may provide and render, and recommendations it may make in the performance of services.
- D. CONSULTANT acknowledges and agrees that as an independent contractor to the DISTRICT that it is subject to terms and conditions of the California Political Reform Act (Gov. Code §81000 *et seq.*) and Fair Political Practices Commission regulations (tit. 2 Calif. Code of Regs §18104 *et seq.*) which includes, without limitation, provisions on conflict of interest. CONSULTANT further agrees to abide these legal requirements throughout the term of this Agreement.

## **ARTICLE 4: CONFIDENTIAL RELATIONSHIP AND OWNERSHIP OF DOCUMENTS**

- A. CONSULTANT agrees that all dealings of the Parties under this Agreement shall be confidential and no report, data, information or communication developed, prepared or assembled by CONSULTANT under this Agreement, or any information made available to CONSULTANT by DISTRICT, shall be revealed, disseminated or made available by CONSULTANT to any person or entity other than DISTRICT without the prior written consent of DISTRICT. All data, calculations, drawings, and other documents developed, prepared, completed, or acquired by CONSULTANT during the performance of its services hereunder shall be given or turned over to DISTRICT upon termination of this Agreement.
- B. CONSULTANT shall provide copies of original source electronic files (*i.e.*, Microsoft Word or Excel files, digital photos, videos, etc.) of all work completed as part of this Contract. Such files shall not be protected, encrypted, or otherwise have their access restricted. Standard report deliverables (PDF/Excel) are included in the prices quoted in Exhibit A. Raw data files will be provided at an extra charge.
- C. Any and all documents, reports, surveys, data compilation, interview results or records produced pursuant to this Agreement by the CONSULTANT shall be the property of the DISTRICT and under the ownership of the DISTRICT.

**ARTICLE 5: PAYMENT TO CONSULTANT**

- A. In consideration of CONSULTANT’s performance of services as described herein, DISTRICT shall pay CONSULTANT fees for its services according to the schedule of rates set forth in Exhibit “A” attached and incorporated by reference herein (i.e., “time and materials”). DISTRICT shall review and approve CONSULTANT’s invoices for accuracy and agree with CONSULTANT on any adjustments that may be appropriate. Such approvals shall not be unreasonably withheld. DISTRICT shall pay CONSULTANT for all approved work and materials within thirty (30) days of agreement on the amount of the invoice. In the event of disagreement with CONSULTANT on adjustments or disallowances, said amounts and disputes shall be withheld until resolved. Upon resolution of the disagreements, payment of the approved amount shall be made within thirty (30) days after deducting therefrom all previous payments and all sums to be retained under the terms of the agreement.
- B. Total fees or compensation to be paid by DISTRICT to CONSULTANT for CONSULTANT’s services described herein shall not exceed \$28,350 without a mutually acceptable, written amendment hereto.

**ARTICLE 6: DISTRICT’S RIGHTS**

CONSULTANT specifically acknowledges and agrees that DISTRICT may terminate CONSULTANT’s services at any time with or without cause, regardless of whether CONSULTANT’s services or the Project are completed. Any termination or any special instructions hereunder from DISTRICT shall be made in writing. In the event of such termination, CONSULTANT shall have the right to expend additional time (not to exceed 10% of the total fees payable under this Agreement) to assemble the work in progress for the purpose of proper filing and closing the job. Such additional time shall not increase CONSULTANT’s total compensation beyond the maximum stated in Article 5.

**ARTICLE 7: INDEMNIFICATION AND HOLD HARMLESS**

CONSULTANT agrees to defend, indemnify and hold harmless DISTRICT and its officers, and employees, from and against any and all liability, damages, costs, losses, claims and expenses, resulting from or connected with CONSULTANT’s negligent performance of this Agreement (including, but not limited to such liability, cost, damage, loss, claim or expense arising from the death of or injury to, or damage to property of CONSULTANT, DISTRICT, or their respective employees or agents), except to the extent that such liability, damages, costs, losses, claims or expenses are caused by the negligent or wrongful acts or omissions of DISTRICT or any of its agents or employees.

**ARTICLE 8: INSURANCE**

CONSULTANT shall provide and keep in effect during the term of this Agreement insurance as follows:

- A. Workers’ Compensation and Employer’s Liability policies in accordance with and as required by applicable laws.
- B. Commercial General Liability policies with combined single limit coverage of at least \$1,000,000 for any personal injury, death, or property damage.
- C. Comprehensive Automobile Liability policies with combined single limit coverage of at least \$1,000,000 for personal injury, death, or property damage.

CONSULTANT shall provide certificates of such insurance to DISTRICT prior to the start of work. Said certificates shall specifically provide that: (1) DISTRICT is an additional insured for the coverage in Items B and C above; (2) any other insurance coverage applicable to the loss shall be deemed excess coverage and CONSULTANT's insurance shall be primary for the coverage in Items B and C above; and (3) such insurance shall not be terminated or canceled without thirty (30) days' prior written notice having been given DISTRICT at its address set forth in this Agreement.

#### **ARTICLE 9: ASSIGNMENT AND DELEGATION**

This Agreement is a personal service contract and the contracted work hereunder shall not be assigned or delegated by CONSULTANT to any person or entity without the prior written consent of DISTRICT.

#### **ARTICLE 10: AUTHORITY TO EXECUTE AGREEMENT**

Both DISTRICT and CONSULTANT do covenant that each individual executing this Agreement on behalf of each Party is a person duly authorized and empowered to execute Agreements for such Party.

#### **ARTICLE 11: NO WAIVER**

No failure or delay by DISTRICT in asserting any of DISTRICT's rights and remedies as to any default of CONSULTANT shall operate as a waiver of the default, of any subsequent or other default by CONSULTANT, or of any of DISTRICT's rights or remedies. No such delay shall deprive DISTRICT of its right to institute and maintain any action or proceeding which may be necessary to protect, assert or enforce any rights or remedies arising out of this Agreement or the performance of this Agreement.

#### **ARTICLE 12: PARTIAL INVALIDITY**

If any term, covenant, condition, or provision of this Agreement is found by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in full force and effect, and shall in no way be affected, impaired, or invalidated thereby.

#### **ARTICLE 13: MODIFICATION**

No alteration or amendment of the terms of this Agreement shall be valid unless made in writing and signed by the Parties. No oral understanding or agreement not incorporated herein shall be binding on any of the Parties.

#### **ARTICLE 14: CALIFORNIA LAW; VENUE**

This Agreement shall be interpreted and construed pursuant to the laws of the State of California. This Agreement shall be governed by the Uniform Commercial Code of the State of California, as amended. The Parties agree that should litigation arising from this Agreement be commenced within California, such litigation shall occur within a court of competent jurisdiction within the County of Ventura.

#### **ARTICLE 15: COMPLIANCE WITH LAWS**

CONSULTANT shall be solely responsible for giving all notices and complying with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority relating to CONSULTANT's work, the safety of the persons or property involved, and their protection from damage or injury.

**ARTICLE 16: FORCE MAJEURE**

Neither CONSULTANT nor DISTRICT shall be liable or deemed to be in default for any delay or failure in performance under this Agreement due to interruption of services resulting, directly or indirectly, from acts of God, civil or military authority, acts of public enemy, war, strikes, labor disputes, shortages of suitable parts, materials, labor or transportation, or any similar cause beyond the reasonable control of CONSULTANT or DISTRICT.

**ARTICLE 17: DISPUTE RESOLUTION**

In the event that CONSULTANT and DISTRICT have a dispute concerning the payment of sums pursuant to their Contract, the Parties agree to be governed by Public Contracts Code Section 20104, et seq. In the event of such dispute, CONSULTANT shall file a written claim with DISTRICT. DISTRICT shall respond in writing within forty-five (45) days or, within thirty (30) days request additional documentation and respond within fifteen (15) days after said request.

**ARTICLE 18: NOTICES**

All notices or other official correspondence relating to this Agreement shall be made by depositing the same as first-class, postage-paid mail addressed as follows:

To CONSULTANT: Trent Markell, Principal  
PF ENGINEERS  
P.O. Box 382  
Berthoud, CO 80513

To DISTRICT: Chris Theisen, General Manager  
VENTURA REGIONAL SANITATION DISTRICT  
4105 West Gonzales Road  
Oxnard, CA 93036-2748

or to such other address as either Party may designate hereinafter in writing delivered to the other Party. All notices shall be deemed to have been received three (3) days after mailing.

**ARTICLE 19: EXECUTION IN COUNTERPARTS**

This Agreement may be executed in one or more counterparts which, taken together, shall be deemed one and the same document. The Parties' signatures to this Agreement transmitted by facsimile or electronic mail transmission shall be deemed binding.

**IN WITNESS WHEREOF**, the parties have executed this Agreement on the day and year first set forth above.

VENTURA REGIONAL  
SANITATION DISTRICT

PF ENGINEERS

By \_\_\_\_\_  
KEVIN KILDEE,  
Chairperson of the Board

By \_\_\_\_\_  
TRENT MARKELL  
Principal

By \_\_\_\_\_  
JULIET RODRIGUEZ  
Clerk of the Board



APPROVED AS TO FORM

ARNOLD, LAROCHELLE,  
MATHEWS, VANCONAS & ZIRBEL, LLP

By \_\_\_\_\_  
ROBERT N. KWONG  
Legal Counsel for DISTRICT

APPROVED AS TO ADMINISTRATION

By \_\_\_\_\_  
CHRIS THEISEN  
General Manager

## EXHIBIT A

### STATEMENT OF WORK & RATE SHEET

The following, subject to DISTRICT modification, deletion, or addition, specifies the work statement and scope of work (See Article 1 of Agreement) to be performed by CONSULTANT for this Agreement and the rates to be charged in connection with CONSULTANT's delivery of RFP development and review services to the DISTRICT for the sale of Toland Road Landfill gas to support the installation and operation of a RNG facility at the Landfill (Project).

#### I. SCOPE OF WORK

CONSULTANT shall provide RFP development and review services in support of the RNG Project at the Toland Road Landfill in two phases as specified in the tasks below:

##### Phase 1: RFP Development

**Task A.** CONSULTANT will work with DISTRICT personnel to prepare bid documents and develop an RFP to support the sale of the gas rights at the Toland Landfill to be used for the installation and operation of an RNG facility at the Landfill. CONSULTANT will work to ensure that all the necessary technical, California-specific regulatory, and financial expectations are outlined and detailed in the RFP to optimize value for the DISTRICT. These topics include, but are not limited to, the following:

1. Historical Landfill Gas ("LFG") production
  - a. Gas samples from current Gas Collection and Control System ("GCCS")
2. Historical waste disposal and future disposal forecast.
3. GCCS status and design parameters
  - a. Current design conditions and expected bidder responsibilities.
4. Available property to lease to the bidder for the installation of an RNG facility.
  - a. Site ingress and egress
  - b. Access to utilities (*i.e.* electric, natural gas, and natural gas pipeline)
  - c. Condensate disposal
5. Applicable Permit requirements (namely Ventura County Air Pollution Control District Permit to Construct and Permit to Operate and Ventura County Conditional Use Permit)

**Task B.** The RFP will also set out in writing in the bid documents the expectations for each bidder relative to the Operations and Maintenance ("O&M") of the GCCS and any necessary federal, state, or local permit applications, approvals, and compliance.

**Task C.** CONSULTANT, after drafting and finalizing the key Project parameters for the RFP, shall specify in writing in the bid documents that each bidder is expected to provide the following deliverables to be included in their bid:

1. Financial offer
2. Financial model, including:
  - a. RNG production
  - b. Expected annual revenues.

- c. Operations and Maintenance expenses
- d. Expected GCCS expansions and/or upgrades.
3. Technology and equipment suppliers to be utilized.
4. Project schedule

## **Phase II – RFP Bid Reviews**

**Task A.** CONSULTANT will work with DISTRICT personnel to evaluate all properly submitted and responsive bids to the RFP. In reviewing the bids, CONSULTANT will exercise their discretion, expertise, and experience gained from performing Independent Engineering (IE) reviews for multiple other RNG projects. CONSULTANT will focus on the following subject areas when reviewing the bids:

1. Relevant experience of the bidder with RNG projects associated with landfill gas collection systems
2. Technology to be utilized (*i.e.* PSA, membrane, etc.)
3. Expected operations of the RNG facility
  - a. RNG Production
  - b. Availability
  - c. Methane collection efficiency
4. GCCS Experience
  - a. GCCS operational plan (*i.e.* utilization of LoCi or other wellfield optimization technology)
5. Operational experience with RNG facilities
  - a. Knowledge and experience in successfully obtaining any necessary federal, state, or local permitting

**Task B.** CONSULTANT will advise DISTRICT management on what/who it considers to be the bidder who can best collaborate with DISTRICT and provide the most value at the Toland Road Landfill. Value includes financial compensation to the DISTRICT, the ability to provide expertise in the management of the GCCS, and support for complying with permit or regulatory requirements at the Toland Road Landfill.

## **II. FEE STRUCTURE**

A. CONSULTANT shall provide the services above on a time and material basis. And CONSULTANT estimates that the cost for this Agreement to be:

1. Phase I – RFP Development: \$16,200
2. Phase II – RFP Bid Reviews: \$12,150

B. CONSULTANT shall complete the Scope of Work as efficiently as possible and shall only bill for the time spent, so if the costs are less than the budgetary estimate above, then those savings are passed directly to DISTRICT. Conversely, if CONSULTANT is going to exceed the budgetary estimate, then CONSULTANT will communicate with DISTRICT to ensure they are aware of the potential cost increase along with the written justification for the increased costs, if any.

C. The hourly rates for the CONSULTANT personnel are defined below:

PF Engineer Rate Sheet 2023

<u>Name</u>	<u>Function</u>	<u>Hourly Rate</u>
Trent Markell	Principal	\$405

D. CONSULTANT may engage additional sub-contractors to support the Statement of Work but only if specialized resources are required. If sub-contractors are to be utilized, then CONSULTANT will provide prior written notice to DISTRICT and obtain the DISTRICT's prior written approval before commencement of any work of these sub-contractors.

E. Expenses. All expenses are included, with the exception of travel and living expenses while traveling to support the Statement of Work. All travel and living expenses will be billed at cost. However, no travel is expected for this statement of work.

F. Invoicing. Subject to Article 5 in the Agreement, all services provided by CONSULTANT will be invoiced monthly. For any services billed on a time and material basis, the invoice will be accompanied by a summary of time spent by each staff member and the travel expenses incurred, if any.

G. Timing. CONSULTANT will work to support the timing required by DISTRICT. The goal is to complete Phase I in 3-4 weeks from the date all parties sign the Agreement, provided that all of the requested DISTRICT information has been provided to CONSULTANT in a timely manner.

## TRENT J. MARKELL, P.E.

### *Principal*

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A registered professional engineer with over 31 years of experience in the engineering field, Mr. Markell has an extensive background in power generation, biofuels, and independent engineering services. As an independent engineer, he has a thorough knowledge of project design, contracting, construction, operations and maintenance, performance testing, and environmental requirements. He has been involved with the design or review over 475 projects with a combined capacity exceeding 87,000 MW and over 2.5 billion gallons per year of biofuels.

Key skills and technology experience includes, but is not limited to:

#### Independent Engineering Reviews

- Technology Assessment
- Contract Analysis
  - PPA/Offtake Agreements
  - Interconnection Agreements
- Construction
  - Methodology and Contracting
  - Schedule and Budget
  - Guarantees/Testing protocols
  - LD Analysis
- Operations and Maintenance
  - Organizational Structure
  - Policies/Procedures
  - Budget/O&M Expenses
- Environmental
- Financial Modeling

#### Other Services

- Expert Witness
- Construction Monitoring
- Owner's Engineering

#### Technologies

- Traditional Power Generation
  - Coal
    - All technologies
  - Combined/Simple Cycle
    - H-Class, F-Class, etc.
- Renewables
  - Solar
  - Wind
  - Biomass
  - Hydro
  - Landfill Gas (“LFG”)
  - Anaerobic digesters
  - Waste to Energy
  - Battery Storage
- Biofuels
  - Ethanol
    - Starch and cellulosic
  - Biodiesel / Renewable Diesel
  - Renewable Natural Gas (“RNG”)

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### EDUCATION AND PROFESSIONAL STATUS

MS (Mechanical Engineering), Union College  
BS (Mechanical Engineering), Rochester Institute of Technology  
Member of the American Society of Mechanical Engineers  
Professional Engineer (Colorado)

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## **EXPERIENCE RECORD**

### **PF ENGINEERS, LLC**

**2012 – Present**

#### *Principal*

Mr. Markell is the founder of PF Engineers, which was established to provide technical due diligence, engineering consulting, and development support for energy projects. The focus of PF Engineers is to provide an additional level of engineering support to help developers to finance projects and to help lenders to understand and to mitigate their technical risk on projects.

### **MOTT MACDONALD GROUP**

**2011 – 2012**

#### *Senior Vice President*

Mr. Markell worked with Mott MacDonald's senior executives to develop a US Independent Engineering practice and to expand Mott MacDonald's presence in North and South America. These responsibilities include managing the US IE practice, providing QA/QC reviews both internally and externally, sales/business development to promote the US IE practice, and all staffing for the IE practice. Mr. Markell also frequently supported project reviews as the project manager to maintain a presence in the market and to support Mott MacDonald's clients both in North America and throughout the world.

### **HARRIS GROUP INC.**

**2006 – 2011**

#### *Vice President/Head of Financial Consulting Business Unit*

Mr. Markell was responsible for the P&L of Financial Consulting business unit, reporting directly to the CEO and the Board of Directors. Developed marketing plans and annual budgets to grow the independent engineering practice with annual revenues of approximately \$1.8M supported with a staff of seven people.

Provided internal Quality Assurance by providing detailed review of all reports prior to issuance to the client. Support the due diligence review of the project technology, contracts, construction, and Operations and Maintenance.

### **R. W. BECK**

**2001 – 2006**

#### *Project Manager*

Managed the due diligence effort on a wide range of facilities and technologies ranging from greenfield power facilities to sludge handling systems. Mr. Markell was one of the primary reviewers for Operations and Maintenance of power generation facilities and maintained the firm O&M database. One of three engineering responsible for maintaining combustion and steam turbine technology reviews.

Supported many of Calpine's due diligence reviews including financing, construction monitoring, performance test monitoring, and annual operations and maintenance reviews.

## **EXPERIENCE RECORD - Continued**

### **GENERAL ELECTRIC (formerly WOODWARD GOVERNOR)**

**1998 – 2001**

#### *Mechanical Systems Engineer*

Performed mechanical retrofits for all types of turbine control systems, specializing in mechanical-hydraulic control retrofits for large main-line turbines. Interfaced with customer to support technical integration of new turbine controls and provided direction on the proper demolition of old hydraulic control system and installation of the new turbine control system.

Developed process to outsource all fabricated parts (i.e. valve actuators, manifolds, HPUs, etc.) and worked with purchasing and vendors to ensure an on-time delivery of mechanical components.

Supported the Woodward ISO9000 efforts by assisting with internal audits and acting as a mentor for other internal auditors on the quality team.

### **ZYGO (formerly NEXSTAR AUTOMATION)**

**1996 – 1998**

#### *Software Engineer/Project Engineer*

Developed software to control the operation of state of the art automation systems. Led junior software engineers in the development of controls software for the automation systems primarily for the hard drive industry.

Designed and engineered large, high volume automation systems. Maintained project budgets, bill of materials, purchased parts, drawings, and customer relations. Directed drafters, designers, other engineers, and technicians towards the completion of the design and installation of the automation systems.

### **COPPER MOUNTAIN RESORT**

**1995 – 1996**

#### *Full Time Youth Ski Instructor*

### **GENERAL ELECTRIC**

**1992 – 1995**

#### *Steam Turbine Design Engineer*

Designed new advanced-aero steampaths to provide efficiency gains for existing steam turbines and led multi-disciplined engineering and drafting team to complete the design. In addition to overall steampath design responsibilities, also have experience in high-pressure casings, buckets, rotors, and cost reductions.

Performed a number of quality audits as a member of GE's internal ISO-9000 audit staff for the Power Generation division.

**PROJECT EXPERIENCE**

**Traditional Power Generation**

*Coal*

Mr. Markell has reviewed most coal technologies including, but not limited to: Pulverized coal (“PC”) boilers, circulating fluidized bed boilers, bubbling bed boilers, oxycombustion boilers, and stoker/mass burn boilers providing steam at subcritical to supercritical and even ultra-supercritical conditions. Additionally, have supported the review of repowering old coal facilities.

Technology	Projects	Capacity (MW)
Coal	25	15,920

A representative sample of Coal projects include:

- 1,950 MW operating PC plant in Pennsylvania to evaluate life extensions and potential repowering.
- 2,000 MW operating PC plant in Pennsylvania to evaluate life extensions versus retirement.
- 1,300 MW operating PC unit in Indiana to retrofit enhanced dry sorbent injection
- 630 MW operating PC unit in Pennsylvania.
- Verification of construction modifications and system performance testing of a 500 MW lignite plant in Mississippi utilizing Alstom CFB boilers.

*Natural Gas (Combined Cycle and Simple Cycle)*

Mr. Markell has reviewed numerous combustion turbine technologies from the 1970’s vintage units to the most current H-Class units. These reviews have included Feasibility studies, IE Reports, Construction Monitoring, Performance Test Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Natural Gas (Combustion turbines)	135	2,384

A representative sample of Natural Gas projects include:

- 570 MW combined cycle plant utilizing GE 7FA.03 technology in Kansas
- 830 MW combined cycle plant utilizing Siemens SGT6-8000H technology in Pennsylvania.
- 840 MW combined cycle plant utilizing Siemens SGT6-8000H technology in Pennsylvania.
- 340 MW simple cycle plant utilizing GE 7HA.02 technology in Massachusetts.
- 135 MW peaking facility utilizing LM6000-PF technology in Mexico.
- 1,000 MW combined cycle plant utilizing GE 7HA.02 technology in Pennsylvania.



**Renewable Energy**

***Wind***

Mr. Markell has reviewed numerous wind projects, which have included reviews of multiple wind turbine suppliers and the application of their wind turbines. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Wind	28	2,384

A representative sample of Wind projects include:

- 228 MW facility utilizing Gamesa G80, G87, and G90 technology in Mexico.
- 100 MW facility utilizing Enercon E92 technology in Quebec.
- 168 MW Portfolio utilizing GE 1.6xle technology in India.
- 100 MW facility utilizing Vestas V82 technology near Oregon.
- 200 MW facility utilizing Gamesa G87 technology near Texas.
- 100 MW facility utilizing Vestas V82 technology near Minnesota.

***Solar***

Mr. Markell has reviewed numerous solar facilities, including reviews of multiple photovoltaic (“PV”) module and inverter suppliers and their application in various solar projects. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Solar	73	1,362

A representative sample of Solar projects include:

- 80 MW PV facility in Utah utilizing Jinko and Longhi modules with FTC single axis tracking and Sungrow inverters.
- 140 MW Solar thermal project utilizing a power tower located in California.
- 130 MW PV facility in California utilizing First Solar modules and GE/Conversol inverters.
- 150 MW PV facility in California utilizing First Solar modules with single axis tracking and SMA inverters.
- 40 MW PV facility in Idaho utilizing Jinko Solar modules with a single axis tracker and SMA inverters.
- Review and site inspection of a portfolio of seven PV facilities ranging from 3 MW to 6 MW in North Carolina utilizing Astronergy modules and Eaton inverters.

## Hydroelectric

Mr. Markell has reviewed multiple hydroelectric (“Hydro”) technologies (i.e. pelton, francis, impulse, pumped storage, etc.) and their application. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Hydro	38	3,649

A representative sample of Hydro projects include:

- 192 MW utilizing Francis technology in Vermont and New Hampshire.
- 167 MW utilizing Francis technology in Vermont and New Hampshire.
- 11 MW utilizing Kaplan technology in Vermont and New Hampshire.
- 41 MW utilizing Kaplan technology in Vermont and New Hampshire.
- 48 MW utilizing Francis technology in Vermont and New Hampshire.
- Review, construction monitoring, performance test verification and Completion certification of a 34 MW hydro facility in Mexico utilizing pelton technology including over 5 kM of tunnels and multiple diversion dams.
  - Included a review of the hydrology for the project.

## Biomass

Mr. Markell has reviewed multiple biomass boiler technologies (i.e. stoker, CFB, BFB, gasification, etc.) and their application. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Biomass	26	935

A representative sample of Biomass projects include:

- 170 MW biomass boiler used in conjunction with an oxycombution turbine, including CO<sub>2</sub> sequestration for a net negative process.
- 2 MW biomass gasification facility utilizing a bubbling bed gasifier in California.
- 18 MW biomass facility, including the burning of tire derived fuel and railroad ties, utilizing stoker boilers with traveling grate in Michigan.
- 18 MW biomass facility, including the burning of tire derived fuel, utilizing stoker boilers with traveling grate in Michigan.
- 18 MW biomass facility utilizing stoker boiler with traveling grate in New Hampshire.
- 50 MW biomass facility utilizing a circulating fluidized bed technology in California.

**Other Renewable Power Technologies**

Mr. Markell has reviewed other atypical renewable technologies. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MW)
Other Renewable Technologies	14	445

A representative sample of hydro projects include:

- 7 MW closed loop anaerobic digester project to utilize Giant King Grass in St. Croix.
- Technology assessment review of a 2-MW waste to energy project processing upwards of 1,000 tons of MSW and biosolids per week in Pennsylvania.
- 9.1 MW Landfill Gas (“LFG”) facility utilizing Solar Mercury 50 technology in California.
- Anaerobic digesters to be installed at numerous dairy farms in California ranging in size of less than 1 MW to over 6 MW.
- 150 MW coal facility conversion to burn biomass with a revised output of approximately 80 MW located in Florida.
- Review and expert witness support of a 24.5 MW waste to energy facility in Pennsylvania.

**Biofuels**

**Ethanol**

Mr. Markell has reviewed multiple ethanol technology providers for both corn-to-ethanol facilities, barley-to-ethanol, and cellulosic. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

Technology	Projects	Capacity (MGY)
Ethanol	29	2,239

A representative sample of ethanol projects include:

- Supported the engineering report for a DOE Part II loan guarantee application for a 120 MGY advanced biofuel production facility utilizing wheat and barley in Montana.
- Supported the engineering report for a DOE Part II loan guarantee application for an integrated commercial 25 MGY cellulosic ethanol and 100 MW biomass power project in Kansas.
- 50 MGY sugar cane to ethanol facility in Louisiana utilizing Praj technology.
- Review and construction monitoring of a 60 MGY corn to ethanol facility in North Carolina utilizing KATZEN technology.
- Review, construction monitoring, and performance test verification of a 110 MGY corn to ethanol facility in Kansas utilizing ICM technology.

### **Biodiesel/Biofuels**

Mr. Markell has completed biodiesel, renewable diesel, and biofuel reviews, which have included multiple feedstocks and technologies. These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

<b>Technology</b>	<b>Projects</b>	<b>Capacity (MGY)</b>
Biodiesel/Renewable Diesel	7	339

A representative sample of biodiesel/biofuels projects include:

- 140 MGY renewable diesel facility in Nevada utilizing fats and oils.
- 100 MGY biodiesel facility in Washington utilizing rapeseed and/or canola oil.
- 105 MGY biodiesel facility in Texas utilizing fats and oils
- Technology and fatal flaw review of a biosolid gasification and clean diesel facility to be co-located with wastewater treatment facilities with pilot plant located in California.
- Fatal flaw review of a 4 MGY biodiesel facility utilizing yellow grease to be located in Colorado.

### **Renewable Natural Gas (“RNG”)**

Mr. Markell has reviewed multiple Renewable Natural Gas (“RNG”) technologies for both biogas feedstocks and Landfill Gas (“LFG”). These reviews have included evaluations of the upgrading facilities and technologies based on the biogas inlet flows in standard cubic feet per minute (“scfm”). These reviews have included Feasibilities studies, IE Reports, Construction Monitoring, and O&M Reviews.

<b>Technology</b>	<b>Projects</b>	<b>Capacity (scfm)</b>
RNG	34	50,784

A representative sample of RNG projects include:

- LFG to RNG processing 1,500 scfm with PSA technology in Utah
- Anaerobic Digester to RNG processing 1,400 scfm of biogas with PSA technology in Washington
- LFG to RNG processing 4,100 scfm with membrane technology in Texas
- Anaerobic Digester to RNG processing 1,000 scfm with membrane technology in Texas
- LFG to low-Btu gas processing 1,000 scfm with initial gas treatment in Texas
- Anaerobic Digester to RNG portfolio of 12 dairies with a nominal combined biogas processing capacity in excess of 4,800 scfm with PSA technology.

*\* Note: All LFG projects included a detailed evaluation of the LFG resource estimates.*

## **DESIGN EXPERIENCE**

Prior to becoming an Independent Engineer, Mr. Markell worked as a design engineer. Some of the design projects that he has completed include:

### **Steam Turbines and steampath upgrades**

- Paiton – 400 MW Advanced Aero steampath
- El Kureimat – 600 MW Advanced Aero steampath
- Jim Bridger – 530 MW Advanced Aero steampath
- East Spurlock – 300 MW Advanced Aero steampath
- Tiger Bay Cogen – 160 MW High Pressure Casing
- Tepco ABWR - 1,350 MW High Pressure Casing support
- Coyote Springs – 150 MW Steampath support
- Smith Cogen – 100 MW Steampath support for barge mounted unit

### **Turbine Controls Retrofits**

- Nine Mile – Two 750 MW oil fired facility utilizing Westinghouse steam turbines
- Plant Branch – 200 MW coal fired facility utilizing GE steam turbine
- Coastal Aruba – 35 MW oil fired facility utilizing Parsons steam turbine
- Plant Bowen – 200 MW of oil fired facility utilizing GE steam turbines
- Baxter Wilson – 400 MW oil/gas fired facility utilizing a Westinghouse steam turbine
- PEMEX compressor station – Frame 5 gas turbine system
- Plant McManus – 40 MW oil/gas fired facility utilizing GE steam turbine
- Kodak – 130 MW facility utilizing Dresser Rand steam turbine
- Long Lake – 71 MW hydro facility utilizing Francis units
- Little Falls – 32 MW hydro facility utilizing Francis units
- Mountain Creek – 400 MW oil fired facility utilizing GE steam turbines
- Huntington Beach – Two 220 MW Westinghouse steam turbines for oil fired facility

### **Manufacturing/Automation Systems**

- GE – Shot peening process assessment
- Pratt & Whitney – Blade manufacturing systems
- Pratt & Whitney – Stator repair automation
- Kryptonics – Roller blade wheel manufacturing automation.
- Intel – Mask inspection automation
- MEMC – Wafer processing automation
- Seagate Technology – Hard drive platter manufacturing automation

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## EXPERT WITNESS EXPERIENCE

- Engaged by Bay Shore Power as an expert witness on litigation relative to a 140 MW CFB plant with operational complaints, *Walleye Power, LLC vs. Bay Shore Power Co.*
- Engaged by Governor Control Systems as an expert witness on an issue related to the control system trip and the cause and effect of this trip on a system wide blackout on the island of Aruba.
- Engaged by Eagle Valley Clean Energy as an expert witness on litigation involving a construction and performance dispute with the EPC Contractor, *Wellons, Inc. vs. Eagle Valley Clean Energy*
- Engaged by the US Department of Justice as an expert witness for litigation involving a Section 1603 application for an open-loop biomass project, *Meadwestvaco Virginia Corp. vs. United States*
- Engaged by the US Department of Justice as an expert witness for litigation involving a Section 1603 application for an open-loop biomass project, *GUSC Energy, Inc. vs. United States*
- Engaged by the US Department of Justice as an expert witness for litigation involving a Section 1603 application for Fuel Cells, *RPI Fuel Cell, LLC and UTS SJ-1, LLC vs. United States*
- Engaged by the US Department of Justice as an expert witness for litigation involving a Section 1603 application for an open-loop biomass project, *W.E. Partners II, LLC vs. United States*
- Provided testimony to the Colorado PUC regarding the potential acquisition of an aging combined cycle facility to be incorporated into the Colorado rate base.
- Provided testimony to the Colorado PUC regarding the Clean Air Clean Jobs Act evaluating the retirement of 900 MW of coal facilities in Colorado.
- Engaged to provide expert witness support for litigation relative to an 800 ton per day, 22 MW waste to energy project in Harrisburg, Pennsylvania. Case settled out of court.
- Engaged to provide expert witness support for litigation relative to the construction of a 5 MGY biodiesel facility in Sante Fe Springs, California. Case settled out of court.

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## PUBLICATIONS/PRESENTATIONS

“Managing Technical and Resource Risk” – presented at Infocast Project Finance Tutorial Fall 2013.

“Managing Technical Risk on Thermal Generation Projects” – presented at Infocast Project Finance Tutorial Fall 2012 and Spring 2013.

“Biomass: Risk Mitigation” – presented at Infocast Project Finance Tutorial: 2011

“Is a Power Plant Shortage Looming” – published Greentech Media 2010

“Natural Gas Poised for Bigger Development” – published Denver Business Journal 2010

“The Energy Puzzle – How the Utility Industry Can Put the Pieces Together” – published epOverviews 2010

“Turbine Control Retrofits: Why, How, What and When” – presented at Power-Gen 2003