

**NATIONAL BIOSOLIDS PARTNERSHIP  
INTERIM AUDIT REPORT**

**San Francisco Public Utilities Commission  
Wastewater Enterprise  
San Francisco, California**

**Audit conducted by**

**NSF-International Strategic Registrations**

**William R. Hancuff, Lead Auditor**

**References:**

National Biosolids Partnership (NBP) *EMS Elements*  
NBP *Third Party Verification Auditor Guidance – November 2001*  
*(Latest Revision August 2011)*  
NBP *Code of Good Practice*  
SFPUC Wastewater Enterprise  
*Biosolids Management System (BMS) Manual*  
*April 30, 2015*

**Final Report – July 24, 2016**

## **INTRODUCTION**

The purpose of the Biosolids Management Program (BMP) interim audits are to verify through regular reviews the system's health and effectiveness between verification audits. The third party on-site interim audits provide independent reviews and support credibility between re-verification audits. The goal of the audit is to collect and evaluate objective evidence related to a portion of the BMP such that over the course of the four interim audits conducted between verification audits all 17 elements are addressed.

The goal of the audit is to determine whether San Francisco Public Utilities Commission Wastewater Enterprise's (WWE) Biosolids Management System (BMS) is functioning as intended, that practices and procedures are conducted as documented, and that the BMS as implemented conforms to the NBP's Code of Good Practice and the BMP requirements of the National Biosolids Partnership (NBP) program objectives.

## **RECOMMENDATION**

The results of the WWE interim audit and review of the corrective action plans are positive, and it is the recommendation of the audit team that the WWE BMS attain the platinum level recognition certification status. Attaining certification is not the end, but rather part of a continuum of a continually improving the biosolids management program.

## **AUDIT SCOPE**

The NSF International Strategic Registrations (NSF-ISR) conducted a third party interim audit of the WWE Treatment Facilities from June 20 through June 23, 2016. The on-site audit team consisted of Dr. William R. Hancuff, Lead Auditor.

The primary objective of the annual interim audit is to ensure the biosolids management program's health by reviewing:

- Progress toward goals and objectives,
- Corrective and preventive action requests and responses.
- Actions taken to correct minor non-conformances,
- Management review process, and
- BMP outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices)

The first four items identified above involved reviewing procedures, activities, processes and products that have general requirements found in the NBP standard elements 5, 14, 15, 16 and 17. The fifth item, BMP outcomes, had the potential of involving other NBP standard elements, namely: 1, 2, 4, 6, 9, 10 and 13. In addition the scope specifically included review and verification of individual BMP Elements 5, 6, 9, 14 and 16. Work involved document review, interviews, and field visits.

In general terms, the scope of the third party interim audit encompasses the entire biosolids value chain (pretreatment, collection and treatment, solids processing through final end use or disposal) with special attention on those practices and management activities that directly support solids and biosolids-related operations, processes, and activities within the wastewater treatment plants' functions.

The physical biosolids facilities included in the audit and visited during the interim audit included both wastewater treatment plants: the Oceanside Treatment Plant (OSP) and the Southeast Treatment Plant (SEP). The following facilities at the OSP were visited and included in the audit: the laboratory, headwork's bar screens, pista grit removal unit, primary clarifiers, aeration basins, secondary clarifiers, gravity belt thickeners, screw press dewatering, new egg-shaped anaerobic digesters (TPAD), cogeneration/hot water boilers, waste gas burners, and solids handling.

And the following facilities at SEP were visited and included in the audit: engineering/operations building, control rooms, headworks, wet-weather headworks, primary clarifiers, aeration basins, secondary clarifiers, gravity belt thickeners, anaerobic digesters, centrifuges, cake solids belt loader, cake load-out facility, scales, cogeneration, and hot water boilers/waste gas burners. In addition the top management and administration of the BMS were reviewed and evaluated at the downtown headquarters facilities.

The ultimate beneficial use sites for biosolids were visited and reviewed including: Craig Jacobsen land application site in Sonoma County, and Emigh Ranch Field 37 land application site in Solano County, CA.

The following individuals were interviewed or otherwise participated in meetings as part of the audit process:

- Tommy T. Moala – Assistant General Manager
- George Engel – Southeast Treatment Plant Superintendent
- Jeff Yee – Oceanside Treatment Plant Superintendent
- Karla Guevarra – Associate Engineer
- Alex Miot – Oceanside Process Engineer
- Adrian Santiago – Regulatory Specialist
- Andrew M. Clark – Southeast Treatment Plant Chief Stationary Engineer
- Anthony Cedeno – Southeast Treatment Plant Stationary Engineer
- Imelda Mangubat – Southeast Treatment Plant Stationary Engineer
- Armin T. Borick – Oceanside Senior Stationary Engineer
- Randy Cipriani – Oceanside Senior Stationary Engineer
- James Faaita – Oceanside Senior Stationary Engineer
- Joe Moore – Oceanside Stationary Engineer
- Wyman Fong – Oceanside Senior Stationary Engineer
- Idil Bereket – Public Relations Officer
- Lauren Fondahl – Environmental Engineer – EPA Region IX (permits)

- John Pugliaresi – Area Sales Director - Synagro
- Simranpreet Kaur – Technical Service Specialist – Synagro
- Craig Jacobsen – Sonoma County land owner and farmer

## **INTERIM AUDIT FINDINGS**

The interim audit included review of the latest version of the San Francisco Public Utilities Commission Wastewater Enterprise BMS Manual updated April 30, 2016 containing the current element procedures, and utilized the most recent version of the NBP Third Party Verification Auditor Guidance dated August 2011. The interim audit found no major non-conformances, 2 minor non-conformances and 6 opportunities for improvement, as well as 2 commendations or positive observations.

The following is a review of the positive observations made during the audit process. Minor non-conformances and opportunities for improvement follow and are presented in the sequence of the NBP standard elements listed by requirement number. These numbers correspond to the Element minimum conformance requirements.

### **Positive Observation**

Overall – WWE is in the process of implementing eLogger, an electronic log book software, at Oceanside. The project will involve use of Tablet notebooks to record routine data collection that is currently being collected and recorded by hand. This system will automatically record the asset number, the physical location of the asset, individual collecting the data, the date and time, the data required, etc. The system eliminates illegible notes and records, transcription errors, hand searching paper records, and allows quick data analyses. It has benefits in several elements of the Biosolids Management Program including: legal requirements, operational controls, monitoring and measurement, documentation, and goals and objectives.

Requirement 14.1 – WWE has significantly expanded the use corrective action plans to address the root cause and develop corrective and preventive actions to deal with operation and maintenance problems as part of the continual improvement process.

### **Minor Nonconformances**

Requirement 5.5 – Not all of the goals and objectives met the SMART criteria, for example:

- Goal 2: Develop Class A biosolids at OSP (changed during the audit to be “attain 131 degrees F for a full 24-hour holding period on a daily basis by December 2017.”)
- Goal 4: Develop a new contracting model for beneficial use options that increase flexibility and diversity of biosolids outlets/disposition (changed during audit to

be “send 5,000 wet tons of biosolids per year to Fairfield-Suisun wastewater facilities for processing during the years 2017 and 2018”.)

- Goal 5: Ensure adequate active volume in the SEP digesters to guarantee regulatory compliance (changed during the audit “attain a minimum hydraulic retention time of 15-days in the digester system (primary plus secondary) as measured on a daily basis for the 2015 operating year.)
- Goal 6: Train 50% of SEP and OSP Operators on principles of anaerobic digestion in anticipation of major plant upgrades (removed during audit and made a part of routine training program for operational control.)

Requirement 12.2 – The WWE intranet version of the Biosolids Management System Manual was not the current version.

### **Opportunities for Improvement**

Element 2 – Consider including in WWE Element 2: Biosolids Management Policy the policy statement that is captured in the reminder cards and posters located throughout the plants.

Requirement 5.1 – Consider increasing the flexibility of the WWE Element 5 – Goals and Objectives procedure to allow for the addition of new goals and objectives at a more frequent period than annually.

Requirement 8.1 – Consider developing a specific BMS general awareness presentation as part of each new or reassigned employee’s orientation program. Additionally consider adding into the current operator training program a short section on how the unit process being covered is related to the biosolids value chain.

Requirement 11.1 – Review the SOP – Responding to Biosolids Spills Within WWE facilities Rev 1.0 dated 4/30/2015 to determine if it accurately reflects the response that would actually be employed (see procedure 3).

Requirement 12.2 – Consider developing a revision methodology that will allow independent revision numbers for each BMS element and creating a revision history table that contains revision number, date, and changes made to the procedure, at the end of each element procedure document.

### **Summary and Closure**

The hard work and dedication of the BMP Team must be recognized. While maintaining BMP certification obviously a team effort, the hard work and dedication of Karla Guevarra and Adrian Santiago must be acknowledged. Also, the encouragement, support and active participation of Tommy T. Moala, Assistant General Manager, ensures the continued success of this program.

For the non-conformances, the WWE BMS Team prepared corrective action plans and will implement corrective actions according to their proposed schedules and their BMS procedures to provide continual improvements to their biosolids program. The corrective action forms have been presented to the lead auditor within 30 days.

All corrective actions for minor nonconformities must be corrected within 30 days of the audit, or within the extensions beyond 30 days found to be acceptable and approved by the lead auditor.

As a further measure to demonstrate continual improvement the opportunities for improvement will be addressed to the maximum extent possible.

The final report and recommendation for recognition at the platinum level of certification will be submitted to NBP within two weeks following approval of the corrective actions for the minor nonconformities submitted to the lead auditor.

#### **SAN FRANCISCO PUBLIC UTILITIES COMMISSION WASTEWATER ENTERPRISE COMMENTS:**

San Francisco Public Utilities Commission, Wastewater Enterprise is pleased that the hard work and dedication of many employees has yielded the positive result of the recommendation of platinum recognition certification of the Biosolids Management System. The process was a constructive learning experience and will assist the agency in meeting its short-term and long-term goals of sustainable biosolids beneficial use and continue to improve its BMS program.

#### **OUTCOMES MATTER**

The San Francisco Public Utilities Commission – Wastewater Enterprises (SFPUC-WWE) established the following overarching goals of the SFPUC-WWE Biosolids Management System:

- Ensure 100% beneficial use of biosolids through the following:
  - Implementation of the Sewer System Improvement Program (SSIP) that will result in the planning, design, and construction of a new digestion facility for the Southeast Water Pollution Control Plant (SEP), which will provide the technology to reliably produce Class A biosolids,
  - Actively cooperate with agencies that govern/regulate biosolids beneficial use by participating in stakeholder groups and meeting/communicating with agencies' representatives, and
  - Promoting local beneficial use of Class A biosolids compost on SFPUC projects, where appropriate.

- Participate in and support the Bay Area Biosolids to Energy (BAB2E) project planning efforts.
- Support the development of new technologies to expand the beneficial use of biosolids.

In 2015 the BMS Team established six goals that were further clarified with six objectives. The goals were established to some degree using Specific, Measurable, Achievable, Relevant, and Time Bound (SMART) criteria.

The NBP requires that goals and objectives be developed for each of their four outcome areas as identified below:

- Environmental Performance,
- Regulatory Compliance,
- Relations with Interested Parties, and
- Quality Biosolids Management Practices.

The goals for 2015 had outcomes that impacted all of the above areas. While it is not a requirement to attain all the goals and objectives established, it is a critical component of the system to make progress towards the intent of the majority of the goals. It should also be recalled that attainment of objectives is not the only measure of continual improvement, but corrective actions play a vital role in that measure.

The WWE's goals applicability relative to each of the above listed outcomes is identified as "Outcome" at the end of the discussion of each goal below.

**2015 Goal 1 – To improve dewatering performance at OSP by 15% in 2015 as compared with the baseline established in 2012 & 2013.**

To accomplish this objective operations personnel will continue to improve the performance of the new dewatering process. The operation of the new screw presses at OSP commenced in 2014 and have the capability to produce significantly drier biosolids cake than the belt presses. In 2014, there were eight months of excellent performance, which resulted in reducing the number of loads from 75 per month to 66 per month – a 12% improvement in performance over the baseline of 2012 & 2013.

During the year it was determined that a more accurate measurement of effectiveness would be wet tons of product as opposed to number of truckloads. Problems developed with the operation of the screw press at the end of 2014 and the total reduction in wet tons was 11%. In 2015 the operational problems became more aggravated and the total production of wet solids for the year increased by 4 % over the baseline years. For the first four months of 2016 the monthly showed a reduction of 2.8% over the baseline. Efforts are continuing to address the operational challenges, which have been attributed to excessive grit, improper pore size openings on screens and struvite buildup on the equipment.

(Note: the baseline for 2012-2013 is 20,502 wet tons per year and an average of 1,708 wet tons per month. For 2014 the annual generation was 18,243 wet tons with an average monthly level of 1,520 wet tons. For 2015 the annual generation was 21,341 wet tons with an average monthly level of 1,778 wet tons. And for January through May 2016 the average monthly generation is 1,673.)

(Note: an adjustment in the time required to attain this goal is being reestablished and a phased action plan is being developed to address the operational challenges.)

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

**2015 Goal 2 – Attain Class A biosolids product at the Oceanside Treatment Plant (OSP) by maintaining the digester temperature at or above 131 degrees for 24 hours in a “batch mode operation” by December 2017 (without generating odor complaints.)**

The action plan involves reconstructing and reconfiguring the four digesters to enable operation of three thermophilic digesters followed by one mesophilic digester operating as Sequencing Batch Reactors (SBR) under a Temperature Phased Anaerobic Digestion (TPAD) process.

Phase I is to obtain thermophilic digestion temperature of 131 degrees in three digesters in a “flow through mode operation” without a holding time requirement by January 2017, while maintaining compliance with the requirement of Class B biosolids production.

Phase II is to attain “batch mode operation” by maintaining 131 degrees for a minimum of 24 hours in one digester commencing in March 2017 and operating in that mode for six months.

Phase III is to transition to a system-wide “batch mode operation” such that by December 2017 Class A biosolids will be produced consistently and without odor complaints.

Digester # 4 commenced operating at thermophilic temperatures in January 2016 and Digester # 3 began thermophilic temperature operations at the beginning of June 2016. Digester # 4 is successfully operating at full feed while Digester # 3 is transitioning to full feed, and both digesters are maintaining a temperature of between 130 and 131 degrees Fahrenheit. Temperatures are monitored continuously and the average temperature is recorded at 15 minute intervals.

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties and Quality Biosolids Management Practices.

**2015 Goal 3 – To reduce the biosolids diverted to landfill by 10%, as measured in tons, from 2014 to 2015.**

The WWE is committed to 100% beneficial use of biosolids and is therefore focused on development of new options for wet-weather beneficial use (other than landfill). These alternatives will ease the transition for the WWE should the landfill option become more limited.

The first step in the development of this flexibility was accomplished through activating an option to land apply in Sacramento County at Silva Ranch, which is permitted for year-round application and has storage during inclement weather.

The second step is being addressed as a separate goal for 2015 (Goal 4).

The first step resulted in reducing the biosolids used in landfills from 41,731 wet tons in 2014 to 36,997 wet tons in 2015, a reduction of 11.3%, exceeding the goal.

Outcome Areas Impacted: Regulatory Compliance, Relations with Interested Parties and Quality Biosolids Management Practices.

**2015 Goal 4 – To develop a new contracting model for beneficial use options that increase flexibility and diversity of biosolids outlets/disposition, such that 5,000 wet tons per year would be transferred to Fairfield-Suisun Sewer District for two years beginning in 2017.**

The intention of this goal is to allow WWE to increase their beneficial use of biosolids. The action plan developed to accomplish this goal is to first sign a memorandum of understanding (MOU) with Fairfield-Suisun Sewer District by the end of 2016. The second step is commencing the two years of hauling at the beginning of 2017.

A possible future step in this goal may be increasing the annual hauling to the District.

Currently SFPUC has completed a draft of the MOU and is awaiting authorization signatures.

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties and Quality Biosolids Management Practices.

**2015 Goal 5 – To attain a minimum hydraulic retention time (HRT) within the primary digesters at the Southeast Water Pollution Control Plant (SEP) such that the HRT never drops below 15 days, as measured on a daily basis throughout 2015, and produces a well-stabilized biosolids that meet the 40 CFR 503 Class B requirements.**

The action plan required to accomplish this goal included a vigorous cleaning program to counteract the impact of grit accumulation in the digesters and to ensure active volume and well-stabilized biosolids that meet the 40 CFR 503 Class B requirements.

Results of digester measurements demonstrate that at no time during 2015 did the HRT drop below 15 days.

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance, and Quality Biosolids Management Practices.

**2015 Goal 6 - To train 50% of SEP and OSP operators on principles of anaerobic digestion in anticipation of major plant upgrades, since both plants will be producing Class A biosolids by 2022.**

Note: This goal was reassigned to be addressed under Manual Element 8: Training.

## **CONCLUSIONS AND RECOMMENDATIONS**

The results of the verification audit show the SFPUC Wastewater Enterprise has a strong Biosolids Management System. The NSF lead auditor reviewed and approved the corrective action plans for each of the minor non-conformances identified during the interim audit. Therefore the recommendation for “Platinum Recognition” of the Enterprise’s Biosolids Management System (BMS) is made to the NBP. The full implementation of the corrective actions for the minor non-conformances will be accomplished according to the schedule proposed in the corrective action worksheets. It is expected that the opportunities for improvement will each be addressed although they do not require formal closure.

As was mentioned previously, a BMP is a continuous improvement process, and continued certification is not the end -- it is part of a continually improving process. The results of this and future audits will provide value added to the system and should be viewed as an overall opportunity to improve. Every audit is a snapshot in time, and does not, or cannot, identify each and every area for improvement. And yet, while no single audit identifies all of the areas for improvement the results of each audit provide an additional incremental step in the overall system’s improvement.

Each internal and interim audit will include a review of: the organization's progress toward goals and objectives; BMP outcomes (environmental performance; regulatory compliance; interested party relations; quality practices); actions taken to correct minor nonconformances; the management review process; corrective action requests and responses; and preventive actions. In addition to the above, all of the elements will be audited individually over the four-year interim period between certification audits, such that all elements are addressed.

Based on discussions between the BMS Coordinators and the third party auditor the following tentative interim audit schedule was established to maintain platinum recognition status over the intervening years between certification audits:

Year 1 (third party) –Elements 5, 6, 9, 14, 16 (completed)

Year 2 (third party) – Elements 1, 8, 15, 17

Year 3 (third party) – Elements 3, 10, 12, 13

Year 4 (internal/third party) – Elements 2, 4, 7, 11

Year 5 (third party) – Re-Verification audit

## **Attachment 1**

### **Documents and Other Objective Evidence Reviewed During the Interim Audit**

#### Element 1. BMS Manual

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Biosolids Management System (BMS) Manual – SFPUC Wastewater Enterprise – April 30, 2015 (including all elements)
- BMS manual element approvals by Tommy T. Moala – Assistant General Manager
- Element 1: San Francisco Public Utilities Commission Biosolids Management System Manual – Rev 002; April 30, 2015
- Appendix B: Biosolids Management System Yearly Calendar
- Identification of biosolids critical control points accomplished by contractors (Biosolids transport, land application, composting, and landfill recycling)
- Element 2: Biosolids Management Policy – Rev 002; April 30, 2015

#### Element 2. Biosolids Management Policy

- Interview with Tommy T. Moala – Assistant General Manager
- Interview with George Engel – Southeast Treatment Plant Superintendent
- Interview with Jeff Yee – Oceanside Treatment Plant Superintendent
- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Element 2: Biosolids Management Policy – Rev 002; April 30, 2015
- Appendix A: National Biosolids Partnership Code of Good Practice
- Biosolids Pocket Cards including critical control points and policy statement
- Appendix B: Biosolids Management System Yearly Calendar
- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Element 9: Communication – Rev 002; April 30, 2015

#### Element 3. Critical Control Points

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Andrew M. Clark – Chief Stationary Engineer
- Interview with Wyman Fong – Stationary Engineer
- Element 3: Critical Control Points – Rev 001; March 31, 2015
- Appendix D: Critical Control Points for the Southeast Water Pollution Control Plant and the Oceanside Water Pollution Control Plant
- Figure 3.1 – Southeast Plant Critical Control Point Schematic

- Figure 3.2 – Oceanside Plant Critical Control Point Schematic
- Appendix D - Critical Control Points Table for SEP and OSP presenting: value chain category, critical control point, operational control, potential environmental impact, reference documents (regulatory requirements), and monitoring parameters
- SEP revised and updated CCPs – May 2016.
- Design layout for new egg shaped digester to be used for TPAD
- Element 8: Training – Rev 002; April 30, 2015
- Element 10: Operational Controls – Rev 002; April 30, 2015
- Element 13: Monitoring and Measurement – Rev 002; April 30, 2015

#### Element 4. Legal and Other Requirements

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Lauren Fondahl – Environmental Engineer – EPA Region IX (permits)
- Interview with John Pugliaresi – Area Sales Director - Synagro
- Interview with Simranpreet Kaur – Technical Service Specialist – Synagro
- Craig Jacobsen – Sonoma County land owner and farmer
- Element 4: Legal and Other Requirements – Rev 002; April 30, 2015
- Appendix D - Critical Control Points Table for SEP and OSP presenting: value chain category, critical control point, operational control, potential environmental impact, reference documents (regulatory requirements), and monitoring parameters

#### Element 5. Goals and Objectives

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Andrew M. Clark – Southeast Treatment Plant Chief Stationary Engineer
- Interview with Jeff Yee – Oceanside Treatment Plant Superintendent
- SPFUC-WWE Biosolids Management System Overarching Goals of the SFPUC-WWE Biosolids Management System
- Discussion of major long term planning program involving Sewer System Improvement Program (SSIP)
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Appendix E: SFPUC BMS Long Term and Short Term Goals and Objectives (detailed description of objective, action plan, tracking progress, responsible group, funds/resources and target dates.)
- Reviewed 2015 Biosolids Management System Goals and Objectives
- Reviewed the details of each Goal for 2015 including: objective, description, action plan, tracking progress, responsible group, resources required and target date.
- Appendix B: Biosolids Management System Yearly Calendar

- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Element 9: Communication – Rev 002; April 30, 2015
- Element 13: Monitoring and Measurement – Rev 002; April 30, 2015

#### Element 6. Public Participation in Planning

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Idil Bereket – Public Relations Officer
- Interview with Lauren Fondahl – Environmental Engineer – EPA Region IX (permits)
- Interview with John Pugliaresi – Area Sales Director - Synagro
- Interview with Simranpreet Kaur – Technical Service Specialist – Synagro
- Interview with Craig Jacobsen – Sonoma County land owner and farmer
- Discussed FDA’s definition that specifically excludes crops produced using biosolids from “organic food”
- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Table 6.1 WVE Public Participation Mechanisms containing formal and informal participation mechanisms
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Element 9: Communication – Rev 002; April 30, 2015
- Biosolids Fact Sheet - undated
- San Francisco Water Power Sewer Website (<http://www.sfwater.org>)
- 2015 WVE Biosolids Management System Performance Report – June 2016

#### Element 7. Roles and Responsibilities

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Not directly evaluated during this audit.

#### Element 8. Training

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Element 8: Training – Rev 002; April 30, 2015
- Reviewed Internal Awareness Training – February 16, 2016 (Power Point slide deck)

#### Element 9. Communications

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Idil Bereket – Public Relations Officer
- Interview with Lauren Fondahl – Environmental Engineer – EPA Region IX (permits)

- Interview with John Pugliaresi – Area Sales Director - Synagro
- Interview with Simranpreet Kaur – Technical Service Specialist – Synagro
- Interview with Craig Jacobsen – Sonoma County land owner and farmer
- Element 9: Communication – Rev 002; April 30, 2015
- Discussions on daily O&M meetings, weekly managers meetings, and quarterly repair and replacement (R&R) meetings
- Transporting Biosolids - Pocket Card with safe handling precautions, spill equipment checklist, spill response and emergency phone numbers
- Biosolids Fact Sheet - undated
- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Element 8: Training – Rev 002; April 30, 2015
- Element 15: Biosolids Management System Report – Rev 002; April 30, 2015
- San Francisco Water Power Sewer Website (<http://www.sfwater.org>)
- 2015 WWE Biosolids Management System Performance Report – June 2016

#### Element 10. Operational Control of Critical Control Points

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Jeff Yee – Oceanside Treatment Plant Superintendent
- Interview with Wyman Fong – Oceanside Stationary Engineer
- Interview with Alex Miot – Oceanside Process Engineer
- Interview with Armin T. Borick – Oceanside Senior Stationary Engineer
- Interview with Randy Cipriani – Oceanside Senior Stationary Engineer
- Interview with James Faaita – Oceanside Senior Stationary Engineer
- Interview with Joe Moore – Oceanside Stationary Engineer
- Interview with George Engel – Southeast Treatment Plant Superintendent
- Interview with Andrew M. Clark – Southeast Treatment Plant Chief Stationary Engineer
- Interview with Anthony Cedeno – Southeast Treatment Plant Stationary Engineer
- Interview with Imelda Mangubat – Southeast Treatment Plant Stationary Engineer
- Interview with John Pugliaresi – Area Sales Director - Synagro
- Interview with Simranpreet Kaur – Technical Service Specialist – Synagro
- Interview with Craig Jacobsen – Sonoma County land owner and farmer
- Element 10: Operational Controls – Rev 002; April 30, 2015
- Element 3: Critical Control Points – Rev 002; April 30, 2015
- Appendix D - Critical Control Points Table for SEP and OSP presenting: value chain category, critical control point, operational control, potential environmental impact, reference documents (regulatory requirements), and monitoring parameters
- Design layout for new egg shaped digester to be used for TPAD
- Extensive discussions on TPAD startup transition
- Reviewed operational problems with the screw press dewatering system at OSP
- Reviewed extensive challenges associated with sand and grit removal at both OSP and SEP
- Discussed eLogger’ future application at OSP

- Element 4: Legal and Other Requirements – Rev 002; April 30, 2015
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Element 8: Training – Rev 002; April 30, 2015
- Element 13: Monitoring and Measurement – Rev 002; April 30, 2015
- Operating Logs at OSP and SEP
- Cool Cardboard Construction – “Duct tape and cardboard engineering” prevents overheating by Armin T. Borick, aka “Turk”
- Reviewed field operations of Emigh Ranch Field 37 land application site in Solano County
- Visited Craig Jacobsen land application site in Sonoma County

#### Element 11. Emergency Preparedness and Response

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Reviewed SOP – Responding to Biosolids Spills Within WWE facilities, Rev 1.0 dated April 30, 2015
- Not directly evaluated during this audit.

#### Element 12. BMP Documentation and Document Control

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Not directly evaluated during this audit.

#### Element 13. Monitoring and Measurement

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Jeff Yee – Oceanside Treatment Plant Superintendent
- Interview with Wyman Fong – Oceanside Stationary Engineer
- Interview with Alex Miot – Oceanside Process Engineer
- Interview with Armin T. Borick – Oceanside Senior Stationary Engineer
- Interview with Randy Cipriani – Oceanside Senior Stationary Engineer
- Interview with James Faaita – Oceanside Senior Stationary Engineer
- Interview with Joe Moore – Oceanside Stationary Engineer
- Interview with George Engel – Southeast Treatment Plant Superintendent
- Interview with Andrew M. Clark – Southeast Treatment Plant Chief Stationary Engineer
- Interview with Anthony Cedeno – Southeast Treatment Plant Stationary Engineer
- Interview with Imelda Mangubat – Southeast Treatment Plant Stationary Engineer
- Interview with John Pugliaresi – Area Sales Director - Synagro
- Interview with Simranpreet Kaur – Technical Service Specialist – Synagro
- Interview with Craig Jacobsen – Sonoma County land owner and farmer
- Element 13: Monitoring and Measurement – Rev 002; April 30, 2015
- Element 3: Critical Control Points – Rev 002; April 30, 2015

- Appendix D - Critical Control Points Table for SEP and OSP presenting: value chain category, critical control point, operational control, potential environmental impact, reference documents (regulatory requirements), and monitoring parameters
- Design layout for new egg shaped digester to be used for TPAD
- Element 4: Legal and Other Requirements – Rev 002; April 30, 2015
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Element 8: Training – Rev 002; April 30, 2015
- Element 10: Operational Controls – Rev 002; April 30, 2015
- Operating Logs at OSP and SEP
- Reviewed field operations of Emigh Ranch Field 37 land application site in Solano County
- Visited Craig Jacobsen land application site in Sonoma County

#### Element 14. Nonconformances: Preventive and Corrective Action

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Element 14: Nonconformances – Preventive and Corrective Action – Rev 002; April 30, 2015
- Reviewed corrective action plans prepared for 2015 third party verification audit
- Internal Audit Report 2015 SFPUC-WWE Biosolids Management System held between February 16 and April 11, 2016
- Reviewed corrective action status form for BMS Internal Audit nonconformances from April 11, 2016 audit
- Reviewed Biosolids Nonconformance Tracking Table (updated quarterly)
- Project Initiation Form
- Wastewater Enterprise - Incident Report Form – Updated Oct 27, 2014

#### Element 15. Biosolids Management Program Report

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Reviewed 2015 WWE Biosolids Management System Performance Report
- Element 15: Biosolids Management System Report – Rev 002; April 30, 2015
- Appendix B: Biosolids Management System Yearly Calendar for 2015
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Element 9: Communication – Rev 002; April 30, 2015

#### Element 16. Internal BMS Audit

- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Interview with Andrew M. Clark – Chief Stationary Engineer

- Element 16: Internal Biosolids Management System Audit – Rev 002; April 30, 2015
- Internal Audit Report 2015 SFPUC-WWE Biosolids Management System held between February 16 and April 11, 2016
- Reviewed corrective action status form for BMS Internal Audit nonconformances from April 11, 2016 audit.
- Element 14: Nonconformances – Preventive and Corrective Action – Rev 002; April 30, 2015
- Appendix B: Biosolids Management System Yearly Calendar for 2015
- Element 17: Management Review – Rev 002; April 30, 2015

#### Element 17. Management Review

- Interview with Tommy T. Moala – Assistant General Manager
- Interview with George Engel – Southeast Treatment Plant Superintendent
- Interview with Jeff Yee – Oceanside Treatment Plant Superintendent
- Interview with Karla Guevarra – Associate Engineer
- Interview with Adrian Santiago – Regulatory Specialist
- Element 17: Management Review – Rev 002; April 30, 2015
- Biosolids Management System, Management Review Agenda, February 16, 2016
- Biosolids Management System, Management Review Minutes, February 16, 2016 (no details or recommendations)
- Appendix B: Biosolids Management System Yearly Calendar for 2015
- Element 5: Goals and Objectives – Rev 002; April 30, 2015
- Element 6: Public Participation in Planning – Rev 002; April 30, 2015
- Element 9: Communication – Rev 002; April 30, 2015
- Element 15: Biosolids Management System Report – Rev 002; April 30, 2015
- Discussion regarding Senior Staff meetings held monthly with discussion of biosolids quarterly