

# INSTRUCTIONS FOR EMS ASSESSMENT

## BACKGROUND

Your utility has committed to be one of twenty-eight (28) NBP Demonstration Agencies participating in the NBP's EMS pilot program. You are joining fourteen (14) wastewater agencies that have already completed an initial EMS Assessment and are in various stages of implementing an EMS that conforms with the *Elements of an EMS for Biosolids (EMS Elements)*.

NBP is funding this initial EMS Assessment exercise to assist your utility begin the EMS implementation process. As a Charter Agency, you have committed to adopting the NBP's Code of Good Practice. The Code of Good Practice is a broad framework of goals and commitments to guide the production, management, transportation, storage, and use or disposal of biosolids. Code subscribers and EMS participants pledge to uphold the following principles of conduct.

### **NBP Code of Good Practice**

1. **Compliance:** To commit to compliance with all applicable federal, state and local regarding production at the wastewater treatment facility and management, transportation, storage and use or disposal of biosolids away from the facility.
2. **Product:** To provide biosolids that meet the applicable (quality) standards for their intended use or disposal.
3. **Environmental Management System:** To develop an environmental management system for biosolids that includes a method of independent third party verification to ensure effective, on-going biosolids operations.
4. **Quality Monitoring:** To enhance the monitoring of biosolids production and management practices.
5. **Quality Practices:** To require good housekeeping practices for biosolids production, processing, transport and storage, and during final use or disposal operations.
6. **Contingency and Emergency Response Plans:** To develop response plans for unanticipated events such as inclement weather, spills and equipment malfunctions.
7. **Sustainable Management Practices:** To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through an environmental management system.
8. **Preventive Maintenance:** To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids.
9. **Continual Improvement:** To seek continual improvement in all aspects of biosolids management (through an environmental management system).
10. **Communications:** To provide methods of effective communications with gatekeepers, stakeholders and interested citizens on key elements of each environmental management system, including information relative to system performance.

To implement the National Biosolids Code of Good Practice, organizations will need an appropriate management system framework that goes beyond the Code of Good Practice. NBP has developed five (5) EMS Blueprint components, which in addition to the Code of Good Practice include:

- *The Elements of an Environmental Management System for Biosolids (EMS Elements) – Interim Final Draft (EMS Elements 10-26 v2)*
- *The Environmental Management System Guidance Manual*(Guidance of how to implement an EMS) - **Draft**
- *The National Manual of Good Practice* (Technical Guidance on Best Management Practices) - **Draft**
- The Independent Third Party Verification Program (formal program conducted by independent third party auditors verifying an Agencies EMS conforms with the requirements of the *EMS Elements*) – **recommendations submitted to Management Committee**

## SUMMARY OF THE EMS ASSESSMENT PROCESS

There are steps you will want to take to prepare for the EMS Assessment. These are covered in the next section. We will schedule a mutually satisfactory date to complete the EMS Assessment visit, ideally between October – December 2000. The EMS Assessment visits will be scheduled to occur over two days, in four (4) sessions. The 2-person EMS Assessment team will travel to your location the night before or the morning of the interview so we can begin no later than 9:00 AM. The sessions will occur sequentially, as follows:

- ◆ **Session 1. Kick-off Session---**The kick-off session will introduce the EMS Assessment team to key members of the agency's staff involved in biosolids management activities. Ideally, this is the same team that will be involved in EMS implementation activities that follow the EMS Assessment. We will also finalize the schedule/times for the subsequent sessions that will be occur over the next 2-days.
- ◆ **Session 2. Review of Relevant Program Documents—**The EMS Assessment team will next comprehensively examine documents and records relevant to your EMS for biosolids. The *Interim Final Draft EMS Elements (Draft EMS Elements)* apply to critical control points and biosolids management activities throughout the biosolids value chain, from pretreatment to final disposition, so the assembled EMS documents and records should cover all these activities. Please review Appendix A, the EMS Assessment Questionnaire and Appendix B which summarizes the *Draft EMS Elements* and provides examples of documents and records that constitute objective evidence of your current EMS for biosolids. The EMS Assessment team will typically spend three to four hours reviewing the documents and records. Time permitting, it is also helpful to get a brief tour of the biosolids management activities that occur at the wastewater treatment facility and close by biosolids management facilities and land-application areas.

- ◆ **Session 3. EMS Assessment Interview**—Following the document review, the team and POTW representatives will convene for the interview, which usually takes between three and four hours. A typical interview proceeds as follows:
  1. **Introduction** of all session participants.
  2. **Overview of National Biosolids Partnership and EMS Demonstration Process**, including a summary of the EMS Blueprint components and the *EMS Elements*.
  3. **General overview of your organization and your biosolids management program** along with the specific roles and responsibilities of various participants involved in biosolids management activities, including contractors. Ideally, this is provided as a written summary that we can incorporate into the final EMS Assessment report.
  4. **Go through the Questionnaire**, element by element; often cross-referencing back to various documents and records reviewed in Session 2.
  5. **Action items**, requested documents and follow-up activities to complete EMS Assessment as well as make a necessary schedule adjustments for Session 4, which typically will begin around 10:00 AM on Day 2.
  
- ◆ **Session 4. Draft Results Briefing**—After the Session 3 interview, the EMS Assessment team will review their questionnaire notes and the EMS Assessment worksheet (see Appendix C) and write-up the draft EMS Assessment report. The EMS Assessment report will include:
  1. A summary of your wastewater treatment and biosolids management program.
  2. Strengths-Weaknesses-Opportunities-Barriers Summary of your EMS for biosolids.
  3. An Element by Element summary describing the *EMS Elements* requirements, your current program, any gaps and recommendations activities to address any gaps.
  4. A copy of the EMS Assessment worksheet and graphic numerical summary reflecting the level of EMS implementation.

The report documents will be presented to the Session 4 attendees by the EMS Assessment team, which will also provide the rationale/basis for the EMS Assessment findings. Session 4 is an interactive process. The objectives are to make sure the findings are correct and understood by the agency's EMS team. Session 4 typically takes two to three hours. We discuss any revisions based on incorrect or incomplete understandings of your biosolids management activities. We will also make sure the Agency's EMS team understands the basis for our findings and the general requirements for implementing any missing or underdeveloped elements of the EMS for biosolids. The final EMS Assessment report will be completed over the next several weeks and returned to the agency.

## GETTING READY FOR THE EMS ASSESSMENT

1. **Step 1 – Assemble your EMS Team.** Select a **cross-functional** team of all individuals and organizations involved in your biosolids management activities, including representatives from your utility’s industrial pretreatment program, WWTP operations, those responsible for storage, transportation and final disposition of biosolids, including contractors. To the extent possible, representatives covering each element of your organization’s biosolids management activities should be included and attend the interview. **Ideally, this team of individuals will be the same group that leads the EMS implementation process following the gaps.**
2. **Step 2 – Distribute the *EMS Elements and EMS Guidance Manual*.** You will be provided with an electronic copy of these documents as “pdf” files for printing and distribution or with one hardcopy for making copies. EMS team members are encouraged to read both the *EMS Elements* and the *EMS Guidance Manual* (Chapters 1-5, relevant sections of Chapters 6-10 and Appendices). Chapter 4 provides an overview of the EMS Element requirements and Chapter 5 provides a summary of the EMS Implementation process.
3. **Step 3 – Distribute other relevant EMS Materials to your EMS Team.** Make copies and distribute these instructions and the attached documents contained in the Appendices to your team members. These materials will help your team get ready for the EMS Assessment exercise:
  - **Appendix A:** Questionnaire for Prototype EMS Assessment;
  - **Appendix B:** Summary of the Prototype EMS elements covering the purpose, contents and examples of each element;
  - **Appendix C:** Example of generic matrix format that will be used to summarize Prototype EMS Assessment results (see the report on Round 1 pilots for actual results);
  - **Appendix D:** Supplementary evaluation worksheet (with graphic results illustration) that the team will use to facilitate its review;
  - **Appendix E:** Biosolids EMS Glossary; and
  - Also provided is *An Environmental Management System for Biosolids: Summary of Pilot Gap Analyses, Round 2 Report*.
4. **Step 4 – Conduct EMS Team Planning/Training Session.** This is an important session if your EMS Team is not familiar with the EMS Elements and have not attended the September 7, 8 NBP workshop. We will provide you with the presentation slides used in this workshop. You should also have the EMS Team read the *EMS Guidance Manual*. The EMS Team should have a general understanding of the EMS Elements. This is also a good time to plan and make assignments for completing Steps 5 and 6, in preparation for the EMS Assessment visit.
5. **Step 5 – Identify Critical Control Points and Gather Biosolids Management and Related Program Documents.** We suggest you begin by identifying your critical control points throughout the biosolids value chain and the corresponding operational controls (SOPs, Sewer Ordinances, Industrial Pretreatment Program) and monitoring and measurement activities/records. As discussed above, in the first part of the EMS Assessment,

the EMS Assessment team will review any policies, procedures, checklists, operating logs, annual reports, monitoring records, or other EMS documents/records you have related to biosolids management activities and your currently management systems, including pretreatment/collection, wastewater treatment, biosolids stabilization and conditioning processes, storage, transportation, and application or other final disposition. Appendix A and B contain general references to the kinds of documents and records that will be pertinent to the EMS Assessment.

- Step 6 – Prepare for EMS Assessment Interview.** We will follow the EMS Elements Questionnaire as we conduct the interview (see Appendix A). Use the Questionnaire as a guide in preparing for the interview. Each staff member should come prepared with a summary (or be prepared to talk about) their specific biosolids management activities and role in your utility's EMS as well go through the Questionnaire. Also, bring along examples of various EMS documents and records to the meeting. During the interview as we go through the Questionnaire, we will begin each EMS category (i.e., Policy, Planning, Implementation, Measurement and Corrective Action, Management Review) by asking you to generally describe how you manage this group of EMS elements (e.g., planning). We will also ask you to provide examples of how specific EMS elements are managed. Also, be prepared to provide a good summary of roles and responsibilities—describe the individuals in your utility or contractor organizations responsible for specific biosolids management activities (e.g., industrial pretreatment, wastewater treatment, biosolids stabilization and conditioning, biosolids monitoring/measurement, biosolids storage, biosolids transportation, biosolids disposition – landfill, composting, land application). One way to do this is to take an organizational chart template and add in each organization units roles and responsibilities.

## EMS ASSESSMENT RESULTS

The EMS Assessment team will complete a draft summary of the EMS Assessment results in matrix-textual format as well as a graphic summary, as illustrated in Appendix C and D, and submit the draft for your review. This will occur while we are still on site, for example the morning of Day 2 after the document review and interview sessions. It is important for as many members of the EMS Team as possible attend Session 4 briefing to participant in the review the draft results. We will walk through the results, taking any comments and identify any revisions that should be made. We will depart with agreement about any changes, then mail you a final summary analysis within several weeks time.

## APPLICATION OF THE RESULTS

The results of the EMS Assessment results have two important purposes.

First, as a Charter Member Demonstration Agency, you and your EMS Team will use the EMS Assessment results to develop your detailed EMS implementation plan. The leader of the Hagler Bailly EMS Assessment team will also be your EMS implementation coordinator under a separate contract that Hagler Bailly has with WEF/NBP. We are providing you the option of extending the EMS Assessment visit to begin working on the EMS implementation plan. At

your option, the Hagler Bailly Team EMS coordinator assigned to your agency will spend an additional day to begin pulling together your EMS Implementation Plan.

Second, the NBP Steering Committee and Staff will use the EMS Assessment and subsequent EMS Demonstration activities to finalize the EMS Blueprint for biosolids, especially the EMS Elements and the EMS Guidance Manual. The NBP will also use the EMS Assessment results to support recruiting and expansion of the Code of Good Practice charter agencies. See the attached report, *An Environmental Management System for Biosolids: Summary of Pilot Gap Analyses, Round 2* for an example of what the report will look like.

## **APPENDIX A: BIOSOLIDS ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) EMS ASSESSMENT QUESTIONNAIRE**

### **Element 1. Biosolids Management Program**

1. Has the organization documented its Biosolids Management Program in an EMS Manual or equivalent set of documents? If yes, have copies of the EMS Manual or documents available.
2. Is it approved by a level of the organization's management with the authority to commit people and resources to biosolids management activities?
3. Does the EMS Manual contain the Biosolids Management Policy?
4. Does it contain or cross-reference Public Participation, Communications and Emergency Preparedness and or Response Programs and Plans required by the *EMS Elements*?
5. Does it cover all critical control points for its biosolids management activities throughout the biosolids value chain?
6. Does it include or cross-reference all operational controls, procedures, processes and other management methods used to achieve and maintain compliance with legal and other requirements?
7. Does the EMS Manual describe roles and responsibilities of employees for performing various biosolids management activities and EMS functions?

8. Does the EMS Manual describe and define those biosolids management activities assigned to contractors?
  
9. Does the EMS Manual contain or cross-reference EMS procedures/management processes describing various EMS functions required by the other 15 EMS Elements?
  - a. Process for updating critical control points
  - b. Procedure(s) for tracking legal and other requirements?
  - c. Procedures for setting and updating biosolids management goals and objectives?
  - d. Proactive Public Participation approach to involve interested parties?
  - e. Roles and responsibilities for biosolids management activities and EMS functions?
  - f. Training on biosolids management activities and EMS functions?
  - g. Communications Program?
  - h. Operational Controls?
  - i. Emergency Preparedness and Response Plan?
  - j. EMS Documentation, Document Control and Recordkeeping procedures
  - k. Monitoring and Measurement procedures/practices?
  - l. Corrective and Preventive Action Procedure/Plans?
  - m. Drafting of periodic Biosolids Management Program Performance Report
  - n. Internal EMS Audit Program/Procedures/Protocols
  - o. Periodic Management Review of EMS Performance?
  
10. Do these EMS procedures/management processes contain cross-references defining
  - a. Who is responsible for EMS functions (e.g. tracking legal requirements, Corrective Action, Internal EMS Audit, Periodic Performance Report, Periodic Management Review)?
  - b. Required records for EMS functions?

11. Does the EMS Manual include an Action Plan defining the schedules, milestones, approved resources, responsible persons, measures to track progress toward the biosolids management goals and objectives defined in Element 5?
  
12. Does the EMS Manual include a management of change procedure (either standalone or included various EMS procedures) for updating EMS Procedures and Operational Controls based on changes in legal requirements and other voluntarily adopted requirements?

**Element 2. Biosolids Management Policy**

13. Does the organization have a Biosolids Management Policy that commits it to following the 10 principles in the NBP Code of Good Practice? Provide a copy of the policy. Is it a binding commitment?
  
14. Does the Biosolids Policy commit the organization to voluntarily adopted requirements that go beyond the NBP Code of Good Practices? If yes, what are those commitments?
  
15. Are the Biosolids Policy commitments incorporated into all the organization's biosolids management activities throughout the biosolids value chain? Are the policy commitments reflected in the biosolids management programs, procedures and practices?
  
16. Does the Biosolids Policy apply to all organizations involved with your biosolids management activities (e.g., separate department of city or county government providing emergency response, running the industrial pretreatment program, etc.)?
  
17. If your organization utilizes contractors for some/all biosolids management activities, are these policy commitments extended to these contractors through Contracts/Service Agreement? Provide a copy of the biosolids Service Agreement(s)/Contract(s).

18. Is the policy communicated to employees? Describe the method(s) used for this communications (e.g., posted on a news board, discussed in staff meetings, included in new employee orientation process, included in EMS Manual, etc.).
19. Is the biosolids policy available to interested parties, including the general public? Describe how it is made available (e.g., available on organization's web page, mailed upon request, distributed at organization's customer service office, etc.).

**Element 3. Critical Control Points**

20. Has the organization identified and documented the critical control points throughout the biosolids value chain under their direct control or influence? (Note direct control means biosolids activities managed by the organization or through contractor they directly control. Influence means managed by other organizations or contractors "influenced" through Service Agreements).
21. Has the organization identified potential or actual environmental impacts at each critical control point?
22. Are the critical control points consistent with those identified in the *NBP's Manual of Good Practice* and other authoritative sources on biosolids management?
23. Is there a documented record of the critical control points throughout the biosolids value chain?
24. Is there a documented procedure/process that is used (will be used) to keep identified critical control points up-to-date? Provide a copy.
25. Are the critical control points up-to-date and consistent with current biosolids management activities? Have there been modifications to the biosolids management activities that are not covered in the critical control points?

26. Are the critical control points being managed by other organizations or contractors identified? Have these critical control points been identified and documented?

**Element 4. Legal and Other Requirements**

27. Does the organization have a procedure for identifying and tracking federal, state and local laws and regulations applicable to its biosolids management activities?
28. Does the organization have a procedure for identifying and tracking other voluntarily adopted requirements for its biosolids management activities (e.g., latest biosolids stabilization technology, land application methods, etc.)?
29. Does the procedure cover all biosolids management activities throughout the biosolids value chain?
30. Does the procedure designate the individual(s) responsible for identifying and track new legal and regulatory requirements?
31. Does the procedure designate the individual(s) responsible for identifying and tracking other voluntarily adopted requirements
32. Does the procedure designated individual(s) responsible for negotiating, maintaining and renewing permit requirements applicable to biosolids management activities (e.g., industrial pretreatment requirements for significant industrial users under NPDES permit)?
33. Does the procedure incorporate or cross-reference a management of change process to assure that new legal and other adopted requirements are communicated to management and staff involved in biosolids management activities?

34. Does the management of change process include provisions for assuring that necessary capital improvements and changes in standard operating and monitoring procedures are planned and implemented, as required?
35. Do the procedures include provisions for communicating changes in legal and other requirements affecting their contracted biosolids management services service to their contractors and for revising contractor Service Agreements?
36. Are there up-to-date records of legal requirements and other voluntarily adopted requirements applicable to the organization's biosolids management activities throughout the biosolids value chain?

**Element 5. Objectives and Targets for Continual Improvement**

37. Has the organization established biosolids program goals (long-term) and associated objectives (short-term interim steps) for improving the performance of its biosolids management activities (e.g., for implementing best practices technology, increasing percent land applied, improving public relations, reducing concentrations of heavy metals and other undesirable pollutants)?
38. Do the organization's goals and objectives shall reflect identified priorities for improving the environmental performance of its biosolids management activities based on its critical control points, identified or potential environmental impacts, legal and other requirements and applicable best management practices as defined in the NBP's *National Manual of Good Practice* and various authoritative information sources on biosolids management?
39. Are these goals and objectives periodically reviewed?
40. Does the organization have documented records of its biosolids program goals and objectives?
41. Are these biosolids program goals and objectives consistent with the organization's biosolids management policy?
42. Are these biosolids program goals and objectives linked to the organization's critical control points, legal and other voluntarily adopted requirements of its biosolids management activities?
43. Are these biosolids program goals and objectives for continual improvement set considering the views and input from interested parties? If yes, provide documented examples.
44. Are these biosolids program goals and objectives integrated into other elements of its EMS, as applicable (e.g., training, capital improvements, monitoring, communications, etc.)?

45. Do these biosolids program goals and objectives apply SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bounded)?
46. Has the organization established measurement methods to enable tracking of progress toward its biosolids program goals and objectives?
47. Has the organization established an action plan that describes those improvement activities it is pursuing to achieve its biosolids program goals and objectives? Does the action plan designate schedules, milestones, resources, and responsibilities for achieving the organization's biosolids program goals and objectives?
48. Has the organization communicated its biosolids program goals and objectives to its employees and contractors involved in biosolids management activities? If yes, provide examples of how this communications process works, how often it occurs, how well it is integrated across various departments of the organization.
49. Are these biosolids program goals and objectives extended to contractor operations? Do the organization's Service Agreements with contractors require them to support the achievement of biosolids program goals and objectives?
50. Can the organization provide objective evidence of conformance with biosolids program goals and objectives requirements?
- a. EMS procedures/process for establishing and updating goals and objectives
  - b. Records of current goals and objectives
51. Does the procedure include cross-references to other relevant EMS Element requirements?
- a. Procedures for measuring program toward goals and objectives in Element 13?
  - b. Summaries of progress toward goals and objectives in Element 15 periodic Biosolids Management Program Performance Reports?

- c. Review of progress toward goals and objectives in Element 17 Periodic Management Review of Performance?

### **Element 6. Public Participation in Planning**

52. Has the organization selected and implemented a proactive public participation approach to involve interested parties in its Biosolids Management Program and EMS planning process? Is it consistent with:

- a. Current level of public interest?
- b. Historic public involvement?
- c. Method(s) of biosolids management/disposition?
- d. Other local circumstances?

53. Does the public participation approach provide information on the organization's independent, third-party verification audit program ? (Note, during demo, this would be an intention to participate based on signing of Code of Good Practice since the program doesn't exist).

54. Is there objective evidence of a proactive public participation plan?

- a. Written Public Participation Program/Plan/Procedures?
- b. Records documenting the interested party involvement per the written Public Participation Program/Plan/Procedures?
- c. Records of how interested party input is considered in developing biosolids program goals and objectives under Element 4?

### **Element 7. Roles and Responsibilities**

55. Has the organization appointed an individual with the responsibility for assuring that all elements of the Biosolids Management Program and EMS are implemented and maintained?

56. Does this individual have the necessary experience and organization-wide authority for overseeing the effectiveness of the EMS and all biosolids management activities?
57. Has the organization formally assigned and documented roles and responsibilities of its employees for biosolids management activities?
58. Has the organization formally assigned and documented roles and responsibilities of its employees for various EMS functions?
59. Is there objective evidence (e.g., from interviews) that the organization is providing adequate human, technical, capital and financial resources for employees to perform their assigned roles and responsibilities?
60. Are contractor roles and responsibilities for biosolids management activities clearly defined in Service Agreements/Contracts?
61. Are contractor roles and responsibilities for EMS functions clearly defined in Service Agreements/Contracts?

**Element 8. Training**

62. Does the organization have an established training program to assure that employees are competent (i.e., have the necessary skills, knowledge and awareness) to effectively perform their assigned biosolids management role and responsibilities?
63. Does the training cover all biosolids management activities at all critical control points throughout the biosolids value chain? If not all activities, which ones are not covered by the training?

64. Is there general awareness biosolids management and EMS training that enable employees to understand how their assigned roles and responsibilities relate to other biosolids management activities throughout the biosolids value chain?
65. Does the organization have an established training program to assure that employees are competent (i.e., have the necessary skills, knowledge and awareness) to effectively perform their assigned EMS function role and responsibilities?
66. What objective evidence of the training program is available?
- a. Job-specific training requirements (consistent with assigned biosolids management activity (e.g., relevant training on EPA Part 503 requirement, Pretreatment requirements under NPDES and other pretreatment and sewer use restrictions)?
  - b. Specific training course material and/or method of training used (e.g., on-the-job, classroom, outside workshops, courses, seminars, WWTP operators certification)?
  - c. How regularly does the training take place?
  - d. Is it repeated periodically with refresher courses/on-the-job evaluations?
  - e. Is employee mastery of skills and knowledge tested and/or formally validated?
  - f. Are there records of job specific training requirements and who is trained?
67. Is there a formal biosolids training program for new or newly reassigned employees?
68. Do the organization's employees (and contractor employees) receive specific training on the Communications Program under Element 9, consistent with their assigned biosolids management activities, their degree of interaction with interested parties, and issues identified as important to public acceptance?
69. Does the organization's Service Agreements/Contracts require contractors to establish and conduct their own biosolids training consistent with the assigned roles and responsibilities for biosolids management and EMS functions?

70. Does the organization evaluate the effectiveness of contractor training as part of its contract administration?

**Element 9. Communication**

71. Has the organization established and maintained a proactive Communications Program that provides on-going information about its Biosolids Management Program and its EMS to interested parties and the public? Is it consistent with:

- a. local circumstances?
- b. the method of biosolids management?
- c. its public communications history?
- d. degree of current interest in its biosolids management activities?

72. Does the Communications Program include a method for making a summary of the independent third-party verification audit results available? (This is a place holder since this program does not yet exist).

73. Does the organization's Communication Program include a procedure for receiving inquiries and requests for information from interested parties about its biosolids management activities and EMS?

74. Does the organization define the roles and responsibilities of outside contractors in its Communications Program?

75. What methods does the organization use for these biosolids management program communications (bulletin boards, employee memos/letter, email, newsletters and periodic Biosolids Management Program Performance Report)?
76. Does the organization's Communications Program include proactive community relations, outreach, and general public education program describing its biosolids management activities?
77. Does the Communications Plan incorporate activities to educate and inform the media, gatekeepers and other interested parties about the organization's biosolids management activities?
78. Do contractors play an active Communications Program role? If yes, are their Communication Program roles and responsibilities defined in their Service Agreements/Contracts?
79. Does it provide information on organization's biosolids management program and performance (e.g., periodic Biosolids Management Program Performance Report/Newsletter)?
80. Objective Evidence:
- a. Written Communications Program, Educational Materials?
  - b. Documents and records demonstrating that the Communications Program is fully implemented?
  - c. Availability of key EMS documents to interested parties (e.g., Biosolids Management Policy, periodic Biosolids Management Program Performance Reports summary of third-party audit results)?

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

81. Has the organization developed and implemented standard operating procedures, work practices and other appropriate management methods at all critical control points throughout the biosolids value chain?
- a. Pretreatment/Collection?
  - b. Wastewater Treatment/Solids Generation?
  - c. Biosolids Stabilization ?
  - d. Biosolids Conditioning ?
  - e. Biosolids Storage?
  - f. Biosolids Transportation?
  - g. Biosolids Disposition?
82. Do the operational controls incorporate all applicable legal requirements as they apply to each critical control point?
83. Do the operational controls incorporate all voluntarily adopted other requirements as the apply to each critical control point?
84. Has the organization considered and applied best management practices as defined in the National Manual of Good Practice and other authoritative sources of best practice information (e.g., WEF Manuals of Practice, State/Local Practice Codes)?
85. Do the operational controls define and cross-reference monitoring, measurement and recordkeeping requirements?
86. Do the operational controls cover preventive/predictive maintenance on all equipment and unit processes used for biosolids management activities at critical control points?

87. Does the organization require contractors to have effective operational controls for their assigned roles and responsibilities for biosolids management activities? Are these requirements defined in the Service Agreements/Contracts?

**Element 11. Emergency Preparedness and Response**

88. Has the organization established and maintained Emergency Preparedness and Response Plans to assure effective response to accidents, abnormal conditions and emergency situations associated with its biosolids management activities? Are there written plans and procedures?

89. Do the Emergency Preparedness and Response Plan address plausible incident scenarios (e.g., truck accident/spill, wastewater treatment plant power outage, serious weather events, floods) consistent with the organization's biosolids management activities?

90. Does the organization periodically test and review the effectiveness its Emergency Preparedness and Response Plans (including communications) and revised them as necessary? Describe the methods or process that is used (e.g., simulation drills, post-incident analysis, periodic response personnel training, etc.). What records exist documenting these activities?

91. Does the organization maintain records of emergency/abnormal incidents requiring emergency response? Does the organization modify its Emergency Preparedness and Response Plans for biosolids management activities to improve their effectiveness based on abnormal conditions, accidents and emergencies that have occurred historically?

92. Are emergency response personnel and equipment readily available (either within the organization and/or through Service Agreements) so as to assure satisfactory response times?

93. Does the organization rely on contractors or other city/regional organizations for emergency response? If yes, have they established Service Agreements defining the roles and responsibilities of these organizations for emergency response?

**Element 12. EMS Documentation, Document Control and Recordkeeping**

94. Does the organization have document control procedures/protocols for all EMS documents and operational controls in its EMS for biosolids?
95. If yes, does the organization's EMS documents and operational control documents follow these document creation and revision protocols?
- a. Documents marked with necessary approvals, initial effective dates, version numbers, revision effective dates, and other references to identify the latest documents in effect?
  - b. Does the organization have proper document creation and replacements practices (e.g., No evidence of obsolete/outdated/superseded documents in use)?
96. Is the EMS manual, including EMS procedures/management processes easily accessible and up-to-date?
97. Are operational controls and similar documents established for biosolids management activities available at their designated locations?
98. Does the organization have an established records management and records retention procedures to ensure that records related to its biosolids management activities are:
- a. Available and can be easily located?
  - b. Retained for the specified retention period?
  - c. Discarded at the end of the retention period?
99. Has the organization established EMS documentation, document control and recordkeeping requirements for biosolids management activities conducted by contractors in the Service Agreements/Contracts?

### **Element 13. Monitoring and Measurement**

100. Does the organization have established monitoring and measurement procedures/practices for monitoring the performance of its biosolids management activities at all critical control points?
101. Do these monitoring and measurement procedures cover all legal and other voluntarily adopted requirements?
102. Does these monitoring and measurement procedures effectively establish conformance with the organization's performance requirements for biosolids management activities (i.e., meeting legal, quality and public acceptance requirements)?
103. Are there procedures for tracking the organization's progress toward achieving its biosolids program goals and objectives?
104. Are the monitoring and measurement records maintained in accordance with the recordkeeping requirements established under Element 12?
105. Does the organization's Service Agreements/Contracts document the contractor's monitoring, measurement and recordkeeping requirements, consistent with their assigned biosolids management activities?
106. Objective Evidence:
- a. Monitoring and measurement procedures available?
  - b. Records of monitoring and measurement per procedures and recordkeeping requirements?
  - c. Service Agreements defining contractor monitoring and measurement requirements, including recordkeeping and retention?

**Element 14. Nonconformance and Corrective and Preventive Action**

107. Does the organization have a formal procedure for investigating any noncompliance with applicable laws and regulations and/or nonconformance with EMS procedures and operational controls discovered:
- a. Informally during routine monitoring and measurement activities required by Element 13; or?
  - b. Formally from the internal EMS audits required under Element 16?
108. Does the procedures establish a formal process to identify the root causes of noncompliance/nonconformance situations identified during routine day-to-day operations and develop a corrective action plan?
- a. Does the process establish responsible for implementing corrective actions (e.g., enforcing existing procedures, amending them, or instituting other corrective measures such as additional training)?
  - b. Does the process establish who is responsible for completing and documenting the corrective action?
109. Does the procedure establish the development and completion of a formal corrective action Plan to address noncompliance/nonconformance situations identified through internal EMS audits or through independent third party audits?
- a. Does the procedure define who is responsible for developing completing the root cause analysis and the corrective action plan?
  - b. Does the procedure define the corrective action plan documentation and tracking requirements regarding schedule, milestones, responsible persons? and
  - c. Does the procedure define documentation of completion for the corrective/preventive actions?
110. Does nonconformance analysis and resulting corrective and preventive actions cover changes to preventive/predictive maintenance on vehicles and equipment?
111. Does the organization have objective evidence of:
- a. The Corrective Action procedure(s)?
  - b. Records of Corrective Action investigations, plans and successfully completion?

**Element 15. Biosolids Management Program Performance Report**

112. Does the organization develop a periodic, written Biosolids Management Program Performance Report (at least annually)?
113. Does the organization's Biosolids Management Program Performance Report:
- a. Summarize monitoring and measurement results demonstrating compliance with legal and other requirements?
  - b. Summarize progress toward its biosolids program goals and objectives?
114. Does the Report include a summary of its independent third party EMS verification audit results?
115. Is the Biosolids Management Program Performance Report available to interested parties and the public?
116. Is the Biosolids Management Program Performance Report available to interested parties and the public using alternative electronic methods such as a biosolids program web page?

**Element 16 Internal EMS Audit**

117. Does the organization have an internal EMS Audit Program/Procedures to systematically evaluate whether the EMS for biosolids is functioning effectively?
118. Does the organizations EMS Audit Program/Procedures evaluate the effectiveness of the EMS in meeting:
- a. Biosolids Policy commitments?
  - b. Legal and other requirements for biosolids?
  - c. Biosolids Program goals and objectives?

119. Does the organization's EMS Audit Program and Procedures define the
- a. Schedule for and scope of the EMS audits?
  - b. Methodology and protocols for conducting the EMS audits?
  - c. Employee roles and responsibilities for conducting the EMS audits, including qualifications of internal auditors?
  - d. Audit report format and process for reporting the findings of the EMS audits?
  - e. Requirements for Corrective Action Plans under Element 14, including the documentation of interim and permanent corrective/preventive actions?
  - f. Management of change process to implement necessary changes to policies, programs, plans, procedures and work practices?
120. Does the organization's EMS Audit Program and Procedures address the effective of its Public Participation approach and Communications Program?

**Element 17. Periodic Management Review of Performance**

121. Does the organization have a formal procedure/process for conducting periodic management reviews that report on the effectiveness of the EMS in meeting biosolids policy commitments, meeting legal and other requirements?
122. Has the organization appointed a lead person for organizing and scheduling the management review?
123. Does the organization's periodic management review procedure/process define the:
- a. Schedule and scope of the review?
  - b. Required records of the review and follow-up actions?
  - c. Documentation of decisions and changes to policies, plans, programs, procedures and practices as a result of decisions made at or as a result of the management review?

## APPENDIX B – SUMMARY OF FINAL DRAFT *EMS ELEMENTS*

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>POLICY</b></p> <p><b>Element 1. Documentation of Environmental Management System for Biosolids</b></p>	<p>Describe the structure of the EMS and how it works</p> <p>Establish action plan to implement goals and objectives</p> <p>Provide Objective Evidence of the <i>EMS Elements</i></p>	<ul style="list-style-type: none"> <li>▪ Comprehensive Biosolids Management Program covering biosolids management activities at all critical control points.</li> <li>▪ Show how the EMS works by linking policy, EMS procedures and critical control points with operational controls, monitoring and records</li> <li>▪ Formalize plans with responsible person, resources, milestones and performance measures</li> </ul>	<ul style="list-style-type: none"> <li>▪ EMS Manual containing:               <ul style="list-style-type: none"> <li>⇒ Biosolids Management Policy</li> <li>⇒ EMS Programs/Plans and Procedures for other 16 Elements include document control and records retention procedures</li> <li>⇒ List of Critical Control Points and associated Operational Controls, Monitoring and Measurement and Records</li> </ul> </li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>POLICY</b>  <b>Element 2. Biosolids Mgmt. Policy</b></p>	<p>Organizational commitment to NBP Code of Good Practice</p>	<p>Commitment to:</p> <ul style="list-style-type: none"> <li>▪ Compliance</li> <li>▪ Meeting biosolids quality stds.</li> <li>▪ EMS verified by third party</li> <li>▪ Quality monitoring</li> <li>▪ Quality practices</li> <li>▪ Contingency and emergency plans</li> <li>▪ Sustainable biosolids practices</li> <li>▪ Preventive maintenance</li> <li>▪ Continual improvement</li> <li>▪ Communications with gatekeepers, stakeholders and the public</li> </ul> <p>Communicated to employees and contractors and available to interested parties</p>	<p>Some form of biosolids policy commitment:</p> <ul style="list-style-type: none"> <li>▪ Biosolids Policy</li> <li>▪ Code of Good Practice Pledge</li> <li>▪ Environmental Policy</li> <li>▪ Biosolids Program Resolution</li> </ul> <p>Records/evidence of communications to employees and contractors</p> <p>Records/evidence of availability to interested parties and the general public</p>
<p><b>PLANNING</b>  <b>Element 3. Critical Control Points</b></p>	<p>Identification of critical control points for effective biosolids management</p>	<ul style="list-style-type: none"> <li>▪ Process for the identification of critical control points throughout biosolids value chain</li> <li>▪ Critical control points are locations, unit processes, activities and/or events that require effective management to assure biosolids legal, quality and public acceptance requirements are consistently met.</li> <li>▪ Identify and document environmental impacts of all critical control points.</li> </ul>	<ul style="list-style-type: none"> <li>▪ List of critical control points through the biosolids value chain</li> <li>▪ Procedure/process for review and update of critical control points based on changing circumstances</li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>PLANNING</b> <b>Element 4. Legal and Other Requirements</b></p>	<p>Stay up-to-date on federal, state and local legal requirements</p> <p>Stay up-to-date on other requirements voluntarily adopted by the organization</p>	<ul style="list-style-type: none"> <li>▪ Procedure/process for tracking new laws, regulations</li> <li>▪ Procedure/process for staying up-to-date on latest methods, technology, and best management practices</li> <li>▪ Formal process to update procedures and practices</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written procedure and up-to-date records of applicable legal requirements</li> <li>▪ Organization regulatory affairs group with this responsibility</li> <li>▪ Subscription to <i>Federal Register</i>, State Bulletins, Trade Journals</li> <li>▪ Staff attendance at trade and professional association meetings, workshops, symposiums, conferences (e.g., annual national biosolids conference)</li> </ul>
<p><b>PLANNING</b> <b>Element 5. Goals and Objectives</b></p>	<p>Drive continual improvement by establishing long-term biosolids program goals and associated short-term objectives for biosolids management activities</p>	<ul style="list-style-type: none"> <li>▪ Formal biosolids management strategy and long-term biosolids program goals to improve the performance of biosolids management activities based on legal and other requirements at critical control points</li> <li>▪ Each biosolids program goal as one or more short-term objectives</li> <li>▪ Goals and objectives meet SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bounded)</li> <li>▪ Formal goal-setting process (e.g., as part of annual business planning cycle) to establish initial and update goals and objectives</li> </ul>	<ul style="list-style-type: none"> <li>▪ Procedure to establish biosolids program goals, each with associated set of interim objectives</li> <li>▪ Records of established biosolids program goals and objectives</li> <li>▪ Example – Goal achieve 100% beneficial use of biosolids through land application by 2004                             <ul style="list-style-type: none"> <li>⇒ Objective #1 -- Pretreatment initiatives to reduce lead and mercury biosolids concentrations by 50% by 2002</li> <li>⇒ Objective #2 - improvements anaerobic digester – design and construct 2 new digesters to achieve 20+ day detention by 2003</li> </ul> </li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>PLANNING</b> <b>Element 6. Public Participation in Planning</b></p>	<p>To establish proactive public involvement in planning process, including input into biosolids program performance improvements</p>	<ul style="list-style-type: none"> <li>▪ Plan/methods for achieving public participation of interested parties in planning process for biosolids management activities based on current level of interest, historic involvement and local circumstances</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written public participation plan/procedures</li> <li>▪ Records of public participation</li> </ul>
<p><b>IMPLEMENTATION</b> <b>Element 7. Roles and Responsibilities</b></p>	<p>Defining organizational roles and responsibilities for biosolids management activities throughout the biosolids value chain, including contractors</p>	<ul style="list-style-type: none"> <li>▪ Designated individual with responsibility and authority for biosolids management program and EMS</li> <li>▪ Formal process and up-to-date records of employee roles and responsibilities for biosolids management activities and EMS functions</li> <li>▪ Contractor roles and responsibilities for biosolids management activities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Biosolids manager or designated individual on senior management team with authority to commit resources and oversee biosolids management activities</li> <li>▪ Organization chart or equivalent records documenting individual and organizational unit roles and responsibilities for biosolids management activities</li> <li>▪ Service Agreements defining roles and responsibilities for contractors</li> </ul>
<p><b>IMPLEMENTATION</b> <b>Element 8. Training</b></p>	<p>Training program to provide the necessary awareness, skill and knowledge to employees and contractors involved in biosolids management activities</p>	<ul style="list-style-type: none"> <li>▪ Formalize training for biosolids, WWTP operators and pretreatment staff</li> <li>▪ Formal regulatory training</li> <li>▪ Requirements for competency/training of contractors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Formal internal training curriculum for biosolids</li> <li>▪ Element of operator certification training</li> <li>▪ Training courses on Part 503 regulations</li> <li>▪ Contractor training requirements</li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>IMPLEMENTATION</b></p> <p><b>Element 9. Communications</b></p>	<p>Formal program for communicating information about the biosolids management program and EMS to employees, contractors and interested parties on</p>	<ul style="list-style-type: none"> <li>▪ Formal communication program and/procedures for biosolids management program for employees, contractors and interested parties</li> <li>▪ Formal procedures for handling complaints and inquires by outside parties (recommended)</li> <li>▪ Formal public education/outreach on biosolids management (recommended consistent with local circumstances and method of biosolids management)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written Communications Program</li> <li>▪ Records of communications with employees, contractors and interested parties (letters, newsletters, meeting minutes, etc.)</li> <li>▪ Written procedure and records of response to public inquiries</li> <li>▪ Formal biosolids public education, promotional program to inform interested parties, including gatekeepers, stakeholders and the general public</li> </ul>
<p><b>IMPLEMENTATION</b></p> <p><b>Element 10. Operational Controls</b></p>	<p>Effective procedures and management processes at all critical control points (locations, unit processes, events and activities that require active management to consistently achieve biosolids legal, quality and public acceptance requirements)</p>	<ul style="list-style-type: none"> <li>▪ Procedures with work instructions, work practices and other appropriate management methods (e.g., SIU Pretreatment Program) to manage all critical control points through the biosolids value chain.</li> <li>▪ Procedures and instructions to ensure that biosolids meet quality, physical characteristics, permit monitoring requirements, etc.</li> <li>▪ Service Agreement/contractual requirements for contractor operational controls</li> </ul>	<p>Operational controls at all critical control points:</p> <ul style="list-style-type: none"> <li>▪ Pretreatment/Collection – permitting, monitoring, inspection, reporting and enforcement procedures</li> <li>▪ SOPs for critical control points in WWTP (e.g., anaerobic digesters, biosolids condition/de-watering storage and QA/QC testing)</li> <li>▪ Transportation procedures</li> <li>▪ Land application procedures, checklists</li> </ul> <p>Contractor Service Agreements defining operational control requirements for contractors</p>

<b>EMS Element</b>	<b>Purpose of Element</b>	<b>Key Requirements of Element</b>	<b>Objective Evidence</b>
<p><b>IMPLEMENTATION</b></p> <p><b>Element 11. Emergency Preparedness and Response</b></p>	<p>Plan/procedures to prepare for and respond effectively to accidents, weather-related emergency situations, abnormal conditions and other contingencies for biosolids management activities</p>	<ul style="list-style-type: none"> <li>▪ Formal emergency plans and procedures for all biosolids management activities</li> <li>▪ Procedures/methods to evaluate the effectiveness of emergency preparedness and response plans</li> <li>▪ Service Agreements with contractors and other organizations supporting emergency response</li> </ul>	<ul style="list-style-type: none"> <li>▪ Formal Emergency Plans and Procedures (Truck accident, flooding, etc.)</li> <li>▪ Simulation drills or follow-ups to incidents triggering emergency response procedures to evaluate effectiveness</li> <li>▪ Contractor/emergency responder Service Agreements</li> </ul>
<p><b>IMPLEMENTATION</b></p> <p><b>Element 12. Documentation, Document Control and Recordkeeping</b></p>	<p>Assure that personnel involved in biosolids management activities have the appropriate, latest approved versions EMS documents and SOPs</p> <p>Assure and effective system for recordkeeping and records retention</p>	<ul style="list-style-type: none"> <li>▪ Formal document management procedure defining document creation and revision protocols and document identification requirements</li> <li>▪ Procedure defining recordkeeping and records retention requirements for biosolids management activities</li> <li>▪ Establish contractor documentation, document control recordkeeping/records retention requirements</li> </ul>	<ul style="list-style-type: none"> <li>▪ Document control procedure and field verification the procedure is being followed (e.g. latest approved version of all program, plans and procedures)</li> <li>▪ Recordkeeping and records retention procedure and field verification the procedure is being followed</li> <li>▪ Contractor Service Agreements</li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>MEASUREMENT AND CORRECTIVE ACTION</b></p> <p><b>Element 13. Monitoring and Measurement</b></p>	<p>Monitoring and measurement procedures for all biosolids management activities to meet all legal, quality and public acceptance requirements</p> <p>Active tracking of progress toward biosolids program goals and objectives</p>	<ul style="list-style-type: none"> <li>▪ Procedures defining required monitoring, measurement and recordkeeping requirements for biosolids management activities at all critical control points</li> <li>▪ Quality control testing and inspection procedures to assure biosolids are meeting prescribed legal, quality and public acceptance requirements</li> <li>▪ Procedure/process for measuring and tracking progress toward biosolids program goals and objectives</li> </ul>	<p>Monitoring, measurement, testing, inspection and QA procedures at all critical control points throughout biosolids value chain, e.g.,</p> <ul style="list-style-type: none"> <li>▪ Procedures defining pretreatment monitoring and inspection activities and associated records</li> <li>▪ Procedures for wastewater treatment, biosolids stabilization, conditioning, processes and associated records</li> <li>▪ Storage and transportation checklists, shipping papers and records</li> <li>▪ Land application checklists and inspections, monitoring procedures and records</li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>MEASUREMENT AND CORRECTIVE ACTION</b></p> <p><b>Element 14. Nonconformances: Preventive and Corrective Action</b></p>	<p>Procedures for identifying, analyzing root causes and correcting noncompliance/ non-conformances with biosolids management program and EMS requirements</p>	<ul style="list-style-type: none"> <li>▪ Procedure defining follow-up process for root cause analysis, corrective and preventive actions when biosolids activities are discovered to be out of compliance or otherwise do not conform with biosolids management program requirements</li> <li>▪ Informal Corrective Action Plans for noncompliance /nonconformance discovered during routine day-to-day operations</li> <li>▪ Formal Corrective Action Plans for noncompliance/ nonconformance identified through systematic internal or third party EMS audit process</li> </ul>	<ul style="list-style-type: none"> <li>▪ Nonconformance: Prevention and Corrective Action Plan Procedures</li> <li>▪ Records of corrective action analysis plans from routine day-to-day</li> <li>▪ Records of corrective action analysis and plans identified through internal or third party EMS audits</li> <li>▪ Formal management of change procedure/records to complete necessary changes to EMS Elements to correct nonconformance</li> </ul>
<p><b>MEASUREMENT AND CORRECTIVE ACTION</b></p> <p><b>Element 15. Biosolids Management Program Performance Report</b></p>	<p>Periodic evaluation and summary of Biosolids Management Program and EMS Performance to drive continual improvement</p>	<p>Periodic Biosolids Management Program report containing summaries of</p> <ul style="list-style-type: none"> <li>▪ Monitoring and testing results demonstrating compliance with legal requirements</li> <li>▪ Monitoring and testing demonstrating performance in meeting other requirements</li> <li>▪ Tracking of progress toward biosolids program goals and objectives</li> </ul>	<ul style="list-style-type: none"> <li>▪ Periodic Biosolids Management Program Performance Report</li> <li>▪ Records of data, testing results, calculations and other information used to compile report</li> </ul>

EMS Element	Purpose of Element	Key Requirements of Element	Objective Evidence
<p><b>MEASUREMENT AND CORRECTIVE ACTION</b>  <b>Element 16. Internal EMS Audit</b></p>	<p>Systematic process for verifying the Biosolids Management Program and EMS are meeting the requirements of the <i>EMS Elements</i></p>	<p>Formalized audit program and procedure of the biosolids management program and EMS covering all critical control points defining</p> <ul style="list-style-type: none"> <li>▪ Scope and frequency</li> <li>▪ Responsible personnel</li> <li>▪ Audit methods and protocols</li> <li>▪ Reporting for findings</li> <li>▪ Corrective action and closeout process</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written audit program and procedures</li> <li>▪ Written audit protocols and methods</li> <li>▪ Formal appointment and training of internal audit team</li> <li>▪ Records of internal audits</li> <li>▪ Record of corrective action plan and audit item closeout</li> </ul>
<p><b>MANAGEMENT REVIEW</b>  <b>Element 17. Periodic Management Review of Performance</b></p>	<p>Periodic reviews of biosolids management program and EMS performance with management to drive continual improvement</p>	<ul style="list-style-type: none"> <li>▪ Formal process for periodic management review of performance covering schedule, scope documentation of findings and follow-up actions</li> <li>▪ Individual(s) assigned schedule, prepare briefing document and conduct management review briefing session</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written management review program</li> <li>▪ Records of management review – briefing documents, decisions and follow-up actions</li> </ul>

## APPENDIX C – GENERIC EXAMPLE OF EMS ELEMENTS EMS ASSESSMENT SUMMARY

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
1. <b>Documentation of Environmental Management System for Biosolids</b>	Describe the structure of the EMS and how it works  Establish action plan to implement goals and objectives	<i>Example:</i> The organization has biosolids management policy and fairly well documented operational controls and recordkeeping but many of the EMS documents and procedures do not exist and no formal action plan for achieving goals and objectives	No formal EMS Manual and the following programs, plans procedures and documents are missing: <ul style="list-style-type: none"> <li>▪ Critical control points</li> <li>▪ Legal req'ts tracking</li> <li>▪ Process for goals</li> <li>▪ Public participation plan</li> <li>▪ Roles and responsibilities and Service Agreement</li> <li>▪ Formal training program</li> <li>▪ Some operational controls</li> <li>▪ Document control and recordkeeping</li> <li>▪ Some monitoring and measurement</li> <li>▪ Correction action procedure</li> <li>▪ Performance Report</li> <li>▪ Internal EMS Audit</li> </ul>	Develop EMS Manual and complete missing EMS programs, procedures and documents  Complete Contractor Service Agreements
2. <b>Biosolids Management Policy</b>	Organizational commitment to Biosolids Code of Practice	<i>Example:</i> Signed pledge to commitment to NBP Code of Good Practice	None	

APPENDIX E. KEY DEFINITIONS

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
3. <b>Critical Control Points</b>	Identification of critical control points for effective biosolids management	Identification of critical control points for effective biosolids management	Lack of a formalized process and written procedure	Develop and document a procedure for identifying and documenting significant environmental aspects of biosolids management activities.
4. <b>Legal and Other Requirements</b>	Stay up-to-date on federal, state and local legal requirements  Stay up-to-date on other requirements voluntarily adopted by the organization	<i>Example:</i> Management is aware of the legal requirements, permits are maintained at each facility.	No one is responsible for tracking requirements. There is no formal process for communicating changes to staff	Assign responsible person(s) and develop a formal procedure for tracking legal/other requirements.
5. <b>Goals and Objectives</b>	Drive continual improvement by establishing long-term biosolids program goals and associated short-term objectives for biosolids management activities	<i>Example:</i> The organization seeks to continuously improve its biosolids activities but does not have formal goals and objectives	The organization does not have formal goals and objectives for biosolids management.	Establish formal biosolids program long-term goals and associated short-term objectives that meet SMART criteria
6. <b>Public Participation in Planning</b>	To establish proactive public involvement in planning process, including input into biosolids program performance improvements	<i>Example:</i> The organization has active public involvement in planning through formal advisory committee with meet semi-annually	Public participation plan not documented	Develop formal public participation program description

APPENDIX E. KEY DEFINITIONS

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
7. <b>Roles and Responsibilities</b>	Defining organizational roles and responsibilities for biosolids management activities throughout the biosolids value chain, including contractors	Example: All employees involved in biosolids management activities receive the necessary on-the-job training; formal training not currently part of biosolids contractors' requirements.	Document training program and establish records  Contractor's training program is not a formal contractual requirement.	Develop Service Agreement with Contractors
8. <b>Training</b>	Training program to provide the necessary awareness, skill and knowledge to employees and contractors involved in biosolids management activities	Example: Formal process for internal communication in place. Management occasionally responds to inquiries from interested parties; there is no formal public education or outreach for biosolids.	External party inquiries and responses are not documented, no formal process for external communication.	Establish formal external communication program; consider formalize public education and outreach efforts.
9. <b>Communication</b>	Formal program for communicating information about the biosolids management program and EMS to employees, contractors and interested parties on	Example: The organization has a formal biosolids public education program with includes a biosolids brochure, newsletter, booths at county fairs and state farm shows	No formal Communications Program  Brochure and newsletter not given to employees	
10. <b>Operational Controls</b>	Effective procedures and management processes at all critical control points (locations, unit processes, events and activities that require active management to consistently achieve biosolids legal, quality and public acceptance requirements)	Example: Detailed procedures and work instructions exist for 75% of the organization's biosolids management activities, including contracted activities. Procedures do not include document control information	Some missing SOPs  There are no references to monitoring and recordkeeping  There are formal document control standards	Create missing SOPs and add links to record keeping  Add document numbers, date created, date revised, approval signature, etc. to current documents.

APPENDIX E. KEY DEFINITIONS

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
11. <b>Emergency Preparedness and Response</b>	Plan/procedures to prepare for and respond effectively to accidents, weather-related emergency situations, abnormal conditions and other contingencies for biosolids management activities	Example: Formal emergency preparedness and response plans are in place for all anticipated contingencies.	None	
12. <b>Documentation, Document Control and Recordkeeping</b>	Assure that personnel involved in biosolids management activities have the appropriate, latest approved versions EMS documents and SOPs  Assure an effective system for recordkeeping and records retention	Example: Organization does not have standard document control procedure and recordkeeping/records retention system  Contractor requirements for document control and recordkeeping are not fully documented in contract	No formalized document control  No formalized recordkeeping  Incomplete contractor requirements for document control and recordkeeping	Develop standard and procedure for document control  Establish formal recordkeeping  Establish document control and recordkeeping in contractor Service Agreement

APPENDIX E. KEY DEFINITIONS

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
13. <b>Monitoring and Measurement</b>	<p>Monitoring and measurement procedures for all biosolids management activities to meet all legal, quality and public acceptance requirements</p> <p>Active tracking of progress toward biosolids program goals and objectives</p>	<p>Example: Comprehensive monitoring and measurement activities are in place for biosolids management activities but do not include tracking of progress toward goals and objectives</p> <p>Contractor requirements for monitoring and recordkeeping are not fully documented in contract</p>	<p>No tracking process for goals and objectives</p> <p>No formalized recordkeeping</p> <p>Monitoring and measurements not linked with operational controls and procedures have no standard document control format</p> <p>Incomplete contractor requirements for monitoring and recordkeeping</p>	<p>Develop formal process for tracking progress toward goals and objectives</p> <p>Standardize document control and links with SOPs</p> <p>Establish formal recordkeeping</p> <p>Establish monitoring and recordkeeping in contractor Service Agreements</p>
14. <b>Nonconformance Preventive and Corrective Action</b>	<p>Procedures for identifying, analyzing root causes and correcting noncompliance/non-conformances with biosolids management program and EMS requirements</p>	<p>Example: The organization has a comprehensive internal compliance audit program; corrective and preventive actions are a standard element of the internal auditing program.</p>	<p>Current program focuses exclusively on compliance</p> <p>No written procedure</p>	<p>Create corrective action procedure</p> <p>Add EMS requirements to corrective action process</p>
15. <b>Biosolids Mgmt. Program Performance Report</b>	<p>Periodic evaluation and summary of Biosolids Management Program and EMS Performance to drive continual improvement</p>	<p>Example: The organization completes a comprehensive annual 503 report but does not produce a report summarizing biosolids management program performance</p>	<p>No Biosolids Management Program Performance Report</p>	<p>Design report and create process and schedule for completing the report</p>

APPENDIX E. KEY DEFINITIONS

EMS Element	Purpose of Element	EMS Assessment for XXX ( <i>Demonstration Agency</i> )		
		Current Situation <i>(per response to questionnaire, document review and interview session)</i>	Gaps vis-à-vis <i>EMS Elements</i>	Example Actions to Conform with <i>EMS Elements</i>
16. <b>Internal EMS Audit</b>	Systematic process for verifying the Biosolids Management Program and EMS are meeting the requirements of the <i>EMS Elements</i>	Example: There is no internal EMS auditing program is in place for the biosolids management activities.  Contractor activities are not monitored or audited	No Internal EMS Audit Program	Establish EMS Audit Program  Appoint and train audit team
17. <b>Periodic Management Review of Performance</b>	Periodic reviews of biosolids management program and EMS performance with management to drive continual improvement	Example: Management reviews are conducted but there is no formal process for it.	No formal management review process exists.	Establish formal management review process.

## APPENDIX E – KEY DEFINITIONS

***Biosolids*** -- solid organic matter recovered from a wastewater treatment process and used especially as fertilizer -- usually used in plural.

***Biosolids Management Activities*** – a wide range of activities that impact the quality of wastewater solids and biosolids, including pretreatment activities, wastewater treatment processes, solids stabilization processes, conditioning and dewatering processes, transportation, storage, and beneficial use or disposal.

***Biosolids Management Policy*** – statement by an organization committing it to the principles set forth in the NBP Code of Good Practice with respect to biosolids management and any other overall environmental goals voluntarily adopted by the organization.

***Biosolids Management Program*** – a comprehensive program covering all aspects of the organization’s biosolids activities throughout the biosolids value chain, including management processes for all critical control points in order to mitigate environmental impacts, meet legal and other requirements and execute action plans to achieve biosolids program goals and objectives.

***Biosolids Program Goal(s)***– environmental performance improvement goals that are consistent with an organization’s biosolids management policy to assure biosolids activities comply with applicable laws and regulations, meet quality and public acceptance requirements and prevent other unregulated adverse environmental and public health impacts by effectively managing all critical control points. Biosolids program goals may include but are not limited to compliance with specific regulatory requirements, expanding beneficial use, improving biosolids quality, improving public acceptance and reducing or eliminating direct/indirect negative environmental impacts.

***Biosolids Program Objective(s)*** – a detailed environmental performance improvement requirement, quantified wherever possible, based on a biosolids program goal. One or more objectives must usually be met in order for the underlying goal to be achieved.

***Biosolids Public Acceptance Requirements*** – biosolids physical, chemical, biological and aesthetic characteristics and management methods that must be met consistently and reliably in order to achieve public acceptance of the organization’s selected biosolids management method(s).

***Biosolids Quality Requirements*** – biosolids physical, chemical, biological and aesthetic characteristics that must be met consistently and reliably in order to apply the organization’s selected biosolids management method(s).

***Biosolids Value Chain*** – sequence of activities from wastewater pretreatment, discharge and collection through wastewater treatment, solids treatment and handling, storage, transportation, and final disposition of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

***Continual Improvement*** – EMS process for systematically improving the overall management of biosolids to achieve the organization’s biosolids program goals and objectives set forth in the organization’s biosolids management policy and the National Biosolids Partnership Code of Good Practice.

## APPENDIX E. KEY DEFINITIONS

**Corrective Actions** – specific actions and steps taken to correct an organization’s nonconformance(s) to policies, procedures, and other legal, quality and public acceptance requirements, and to mitigate any resulting negative impacts on the environment.

**Critical Control Points** – those locations, unit processes, events, and activities throughout the biosolids value chain under the organization’s direct control or influence that require effective policies, programs, procedures, practices, monitoring and measurements to assure the biosolids activities meet legal, quality and public acceptance requirements and do not have undesirable environmental impacts. Critical control points include all biosolids management activities that are covered under applicable legal and other requirements.

**Emergency Preparedness** – a structured emergency planning process to ensure that plausible emergency situations that can affect appropriate biosolids management have been identified, response plans and procedures developed, and trained emergency response personnel and equipment are available and in a state of readiness.

**Emergency Response** – specific emergency plans and activities that are initiated to contain an emergency situation and bring it under control so as to minimize environmental impacts.

**EMS Audit (Internal)** – a systematic internal audit process for objectively evaluating whether an organization’s environmental management system for biosolids conforms with the requirements of *Code of Good Practice*, its Biosolids Policy and the *EMS Elements*.

**EMS Audit (Third Party Verification)** – a systematic, structured audit of the organization’s biosolids EMS performed by a qualified independent third party auditor using a standardized protocol to verify conformance with the requirements of the *Code of Good Practice*, its Biosolids Policy and the *EMS Elements*.

**EMS Documents** – various documents that collectively comprise the biosolids environmental management system documentation, including the biosolids management policy, procedures, practices, operating instructions, and other supporting documents required by the environmental management system and applicable biosolids laws and regulations.

**EMS Guidance Manual** – A detailed manual with useful step by step guidance on how to implement the EMS Elements; and

**EMS Records** – various records/reports of biosolids management activities required by the environmental management system and applicable biosolids laws and regulations, including but not limited to records/reports of monitoring, measurement, laboratory testing, inspections, operating logs, emergency response incident, outside party inquiries, public participation meetings, audits, corrective actions, management reviews and periodic performance reports. Records describe the results of specific biosolids management activities for a prescribed event, activity and/or period of time.

**Environmental Impacts** – any change to the environment (positive or negative) including public health, public nuisance and odor problems, that wholly or partially result directly or indirectly from the organization’s activities, products or services, including those activities associated with biosolids management, and those activities that alter (positively or negatively) the acceptable disposal/use method or create public nuisance and public health risks.

**Environmental Management System for Biosolids (EMS)** – an organized management system that meets the requirements of the *EMS Elements* for achieving the biosolids management policy requirements and

## APPENDIX E. KEY DEFINITIONS

for developing, implementing, reviewing, and maintaining effective biosolids management programs, procedures and practices. The EMS needs to manage all critical control points associated with biosolids activities where there is a potential to create significant negative environmental impacts.

***Interested Parties*** – individuals, groups or other public/private organizations interested in, involved with or otherwise affected by the organization’s biosolids management activities, including customers, farmers, regulators and other local/state governmental officials, community residents, the media, environmental and public interest groups, university professors and the general public.

***Knowledge*** – to recognize, be familiar with, or understand information, activities, and actions based on experience or association; acquaintance with a science, art, or technique.

***Legal Requirements*** – the environmental federal, state and local laws and regulations that are applicable to an organization’s biosolids management program activities.

***Measurement*** – a systematic method for estimating, testing, or otherwise evaluating key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

***Monitoring*** – a systematic process of watching, checking, observing, inspecting, keeping track of, regulating or otherwise controlling key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

***National Manual of Good Practice*** – A detailed set of documents that provides guidance on the identification of critical control points and the selection of appropriate management practices.

***Nonconformance*** – a deviation in organization’s established Biosolids Management Policy and Environmental Management System from the *Code of Good Practice* principles and/or the requirements of the *EMS Elements*. Nonconformances include circumstances that have the potential to create a noncompliance situation or significant environmental impact

***Noncompliance*** – a deviation from federal, state and local laws, regulations and other compliance requirements applicable to the organization’s biosolids management activities.

***Objective Evidence*** – policies, ordinances, procedures, manuals, inspection checklists, operating logs, annual reports, various other documents, and various records – monitoring, inspection, enforcement, training, etc., that objectively document conformance with the *EMS Elements* requirements

***Operational Controls*** – ordinances, regulations, standard operating procedures, practices, technology, instrumentation and process controls, monitoring and other criteria developed, implemented, and maintained by an organization to ensure effective management of all critical control points associated with its biosolids management activities; including conformance with biosolids management policy requirements; and achievement of biosolids program goals and objectives.

***Organization*** – enterprise, authority, or institution, or part thereof, responsible for individual or a combination of, biosolids management activities.

***Other Requirements*** – other binding biosolids management practices and environmental requirements to which an organization voluntarily subscribes as part of its environmental management system. Examples

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include binding agreements with customers, suppliers, and public organizations and commitments to “beyond compliance” performance.

***Preventive Actions*** – specific actions and steps taken to identify, analyze, and eliminate the root causes of noncompliance(s) and nonconformance(s) and to put in place permanent solutions that will prevent a recurrence.

***Public (Interested Parties)*** – same as the definition of interested parties

***Public Education*** –systematic public communications program for educating interested parties and other stakeholders on its biosolids management activities.

***Public Participation*** – specific approach(es) and action(s) taken by an organization to involve interested parties and the general public in its biosolids management program, including establishing improvement goals and objectives.

***Service Agreement(s)*** – contractual or other legally binding agreements that define the roles and responsibilities of contractors and other groups in supporting the organization’s EMS for biosolids.

***Skills*** – the ability to use knowledge effectively and readily in execution or performance of tasks and activities; a developed aptitude or ability; the ability to do something competently.

***Training*** – teaching to make fit, qualified, or proficient; preparation for a test of skill or knowledge; instruction in disciplines and techniques