



## Elements of a Biosolids Management Program

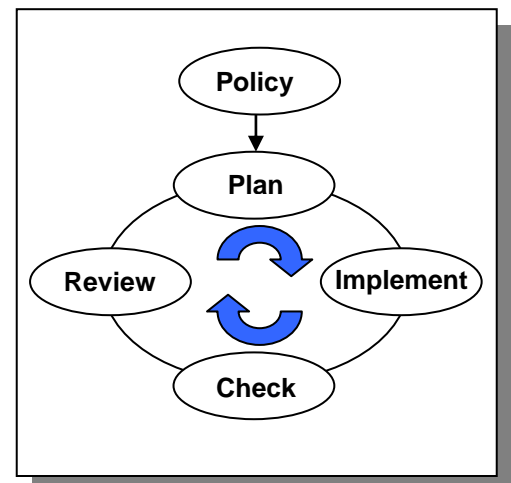
### Preamble

The National Biosolids Partnership (NBP) has developed the *National Biosolids Code of Good Practice*, which emphasizes best practices, communication, and implementation of environmentally sound management programs. The NBP Biosolids Management Program (or BMP) is a framework for a biosolids management system, providing a standardized and comprehensive management framework to ensure that biosolids activities are managed effectively.

This document, *Elements of a NBP Biosolids Management Program (BMP Elements)* is an integral part of the overall management framework that makes up the NBP Biosolids Management Program. The *BMP Elements* establish management system requirements for managing biosolids activities effectively at all critical control points in the treatment of wastewater solids, transportation, and end use or disposal of the biosolids. These Elements cover management commitments, planning processes, organizational development, operating procedures, documentation requirements, monitoring, and review processes.

Overall, the *BMP Elements* described in this document provide an effective process for optimizing management of wastewater treatment solids and biosolids. Adopting the *BMP Elements* will help organizations that manage biosolids activities ensure compliance with applicable federal, state, and local regulatory requirements and address other environmental issues such as odor that could cause community concerns. Implementing the *BMP Elements* also will help organizations apply best practices and will foster continual improvement in biosolids management practices.

The NBP Biosolids Management Program provides a rigorous management framework that will produce a consistently stable, high-quality, biosolids product. To achieve that end, the *BMP Elements* should be considered and implemented as a coordinated system, rather than independent,



disconnected components. Ultimately, the NBP hopes that implementation of the NBP Biosolids Management Program on a broad scale will help develop and promote the use and disposal of biosolids.

The *BMP Elements* use an environmental management system framework similar to the ISO 14001 Environmental Management System standard. The *BMP Elements* have been adapted to meet the needs of organizations managing solids and biosolids. As with the ISO 14001 standard, the *BMP Elements* are based on the Deming quality management cycle for continual improvement (Plan–Do–Check–Act), a management process used successfully by manufacturing and service organizations to improve the quality of their activities, products, and services, and to manage environmental compliance. The *BMP Elements* include five sequential steps for developing and implementing a BMP:

1. Biosolids management policy
2. Biosolids management planning
3. Biosolids program implementation
4. Measurement and corrective action
5. Management review

The *BMP Elements* are applicable to all biosolids management activities that the organization can control or influence directly. The *BMP Elements* are applicable to any organization involved in biosolids management activities that wishes to accomplish the following:

- Implement, maintain, and improve its biosolids management program;
- Use best-management practices, as defined in the National Biosolids Partnership's *National Manual of Good Practice for Biosolids*;
- Ensure its conformance to the National Biosolids Partnership's *Code of Good Practice*; and/or
- Demonstrate conformance with the *Code of Good Practice* to customers, regulators, local residents, and other local stakeholders through a third-party verification process.

The NBP *Code of Good Practice* commits an organization to conducting an independent, third-party verification audit to document BMP conformance with the *BMP Elements*. Successfully completing a third-party verification audit is a requirement for achieving NBP Gold-level Recognition or Platinum-level Certification. The *BMP Elements* presented in this document contain objective requirements that are suitable for third-party verification, regardless of which level of NBP recognition or certification your organization chooses to pursue. The third-party verification process and procedures have been developed in a separate set of documents, which include auditor qualifications and requirements to receive recognition from the NBP for implementation of the NBP Biosolids Management Program.

The *BMP Elements* define the requirements but do not prescribe specific approaches, methods or activities. The *BMP Elements* are flexible and allow an organization to determine how its implementation of the NBP Biosolids Management Program will meet the requirements set forth in each of the 17 Elements. A third-party auditor will look for objective evidence that the organization is doing what said it would do to meet the requirements of all 17 *BMP Elements* and that the organization is implementing the Biosolids Management Program as a cohesive management system.

In addition, there are two guidance documents that should be considered in developing and implementing the *BMP Elements*:

1. *Biosolids Management Program Guidance Manual* – A detailed manual with useful step-by-step guidance on how to implement the *BMP Elements*.
2. *National Manual of Good Practice for Biosolids* – A detailed set of documents that provide guidance on identifying critical control points and selecting appropriate management practices.

### **NBP Statement of Purpose or Intent**

The National Biosolids Partnership (NBP) is a not-for-profit alliance formed in 1997 with the National Association of Clean Water Agencies (NACWA), the Water Environment Federation (WEF), and the US Environmental Protection Agency (EPA). Its purpose is to advance environmentally sound and publicly accepted biosolids management practices.

The NBP has sponsored several initiatives designed to promote responsible biosolids management within the industry, with the goal of enhancing public perception of biosolids programs. The cornerstone of these initiatives is a framework for preparing and implementing an NBP Biosolids Management Program, which includes an independent, third-party verification step. Development of a management system based on the NBP Biosolids Management Program and its associated requirements is voluntary. It is the goal of the NBP that all publicly owned treatment works and commercial biosolids preparers, as defined by EPA, voluntarily adopt and implement a formal Biosolids Management Program.

It is not the intent of the NBP that the NBP Biosolids Management Program be a substitute for regulatory oversight or that the BMP requirements be included as a regulatory requirement in National Pollutant Discharge Elimination System (NPDES) permits. However, the NBP Biosolids Management Program can be used by facilities as a mechanism to ensure compliance with permit requirements.

### **Organization of the BMP Elements**

As illustrated in the table below, the *BMP Elements* include 17 individual management elements that must be addressed in developing a NBP Biosolids Management Program. Each management element contains a set of requirements that can be measured objectively. The requirements have been designed to allow

the organization a significant level of flexibility in how it chooses to implement the requirements.

While the content and structure of the *BMP Elements* is similar to the international ISO 14001 standard, they contain specific biosolids management requirements based on best practices that were observed in successful biosolids programs. For example, proactive public participation, communication, education, and outreach are important factors in achieving public acceptance.

**Table 1 — Biosolids Management Program Elements**

Category	Element Number	Element
Policy	1	Biosolids Management Program Manual
	2	Biosolids Management Policy
Planning	3	Critical Control Points
	4	Legal and Other Requirements
	5	Goals and Objectives
	6	Public Participation in Planning
Implementation	7	Roles and Responsibilities
	8	Training
	9	Communication
	10	Operational Control of Critical Control Points
	11	Emergency Preparedness and Response
	12	Documentation, Document Control, and Recordkeeping
Measurement and Corrective Action	13	Monitoring and Measurement
	14	Nonconformances: Preventive and Corrective Action
	15	Biosolids Management Program Report
	16	Internal BMP Audit
Management Review	17	Management Review

## Key Definitions

**Audit Criteria** - Policies, practices, procedures, or requirements against which the auditor compares collected audit evidence about the subject matter.

**Audit Findings** - Results of the evaluation of the collected audit evidence compared with the agreed audit criteria.

**Biosolids** – The nutrient-rich organic materials resulting from the treatment of domestic sewage at a wastewater treatment facility. Through biosolids management, solid residue from wastewater treatment is processed to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial agricultural product.

**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 (BMP)** – 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 quality and public acceptance requirements, meet legal and other requirements, and execute action plans to achieve biosolids program goals and objectives. A BMP meets requirements of the *BMP Elements* for developing a biosolids management policy and for developing, implementing, reviewing, and maintaining effective biosolids programs, procedures, and practices.

**Biosolids Management Program Audit** - A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization’s BMP conforms to the requirements of the NBP *Code of Good Practice*, the organization’s biosolids management policy, and the 17 *BMP Elements*. BMP audits may be conducted by internal audit teams and/or qualified independent third-party auditors.

**Biosolids Management Program Documents** – Various documents that collectively compose the BMP documentation, including the biosolids management policy, BMP manual, procedures, practices, operating instructions, and other supporting documents required by the BMP and applicable biosolids laws and regulations.

**Biosolids Management Program Guidance Manual** – A detailed manual with useful step-by-step guidance on how to implement the *BMP Elements*.

**Biosolids Management Program Records** – Various records or reports of biosolids management activities required by the BMP and applicable biosolids laws and regulations, including but not limited to records or reports of monitoring,

measurement, laboratory testing, inspections, operating logs, emergency response incidents, 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, or period of time.

***Biosolids Program Action Plans*** – Action plans designating schedules, milestones, resources, and responsibilities for achieving biosolids program goals and objectives.

***Biosolids Program Goal(s)*** – Performance improvement goals that are consistent with an organization’s biosolids management policy to ensure 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 include but are not limited to compliance with specific regulatory requirements, improving biosolids quality, improving public acceptance, and reducing or eliminating direct/indirect negative environmental impacts.

***Biosolids Program Objective(s)*** – A detailed performance improvement requirement, quantified wherever possible, based on a biosolids program goal. One or more objectives usually must be met 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 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 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 disposal or use of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

***Changing Circumstances*** – Internal and external changes that affect the organization’s BMP, including changes in legislation, varying expectations of interested parties, changes in the organization’s products or activities, technological advances, consumer interests, and feedback from environmental incidents.

***Continual Improvement*** – 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 NBP *Code of Good Practice*.

***Corrective Action*** – 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 ensure 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.

**Document Control** – Procedures and practices to ensure that BMP documentation and documents are available and can be located easily, created following established document creation protocols, kept up to date through periodic reviews and revisions, properly marked with version number, effective date(s), and references to replaced or superseded versions; and approved by authorized personnel.

**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 have been 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 to minimize environmental impacts.

**Environmental Impacts** – Any change to the environment (positive or negative), including public health, public nuisances, 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 or use method or create public nuisance and public health risks.

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

**Legal Requirements** – The federal, state, and local laws and regulations that are applicable to an organization’s BMP 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** – Provides detailed guidance on identifying critical control points and selecting appropriate management practices.

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

**Nonconformance** – A deviation in an organization’s established biosolids management policy or BMP from the NBP *Code of Good Practice* principles or the requirements of the *BMP Elements*. Nonconformances include circumstances that have the potential to create a noncompliance situation or significant environmental impacts.

**Objective Evidence** – Policies, ordinances, procedures, manuals, inspection checklists, operating logs, annual reports, various other documents, and various records, such as monitoring, inspection, enforcement, and training records, that objectively document conformance with the *BMP 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 requirements to which an organization voluntarily subscribes as part of its BMP. Examples include binding agreements with customers, suppliers, and public organizations and commitments to “beyond-compliance” performance.

**Outcomes Areas** – For specific outcomes areas where the NBP has defined specific expectations for the BMP to support performance improvement: 1) environmental performance; 2) regulatory compliance; 3) relations with interested parties; and 4) quality biosolids management practices.

**Preparer**- Organization who generates solids or biosolids during the treatment of domestic sewage in a treatment works or the organization that derives a material from wastewater solids or biosolids. Examples of preparers would be a public wastewater treatment plant or a private company that manages a compost facility or drying facility that changes the quality of the solids or biosolids to produce a product that meets federal regulations (CFR part 503) for use or disposal.

**Preventive Action** – 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.



**Procedure** – Documented protocol for meeting the requirements of a BMP Element that defines the purpose, terms, detailed actions, responsible persons, and supporting documentation relevant to that Element.

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

**Public Education** – Systematic public communication program for educating interested parties and other stakeholders on an organization's 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 BMP, including establishing improvement goals and objectives.

**Responsibility(ies)** – The specific task(s) a group or individual carries out in a lead or supporting role that accomplishes or supports operational or strategic goals and objectives.

**Role(s)** – The purpose(s) of the activity(ies) a group or individual performs with respect to the biosolids value chain, biosolids operations, and the BMP.

**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 BMP.

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

**Third-Party Verification** – The process of having a BMP verified by an independent, qualified auditor.

## Elements of a Biosolids Management Program — Element-by-Element Requirements

### Policy

#### ***Element 1 — Biosolids Management Program Manual***

The *BMP Elements* describe an organization's requirements for establishing and maintaining a comprehensive Biosolids Management Program (BMP) that covers its biosolids management activities at all critical control points throughout the biosolids value chain.

The BMP (including the other 16 BMP Elements) shall be documented in a BMP Manual or equivalent set of program documents that describe, at least at a general level, the applicable policies, programs, plans, procedures and management practices in the BMP. The BMP Manual shall:

1. Be approved by a level of the organization's management with the authority to commit people and resources to biosolids management activities;
2. Contain the organization's biosolids management policy and procedures required by the *BMP Elements*;
3. Contain or cross-reference public participation in planning, communication, and emergency preparedness and response programs and plans required by the *BMP Elements*;
4. Cover all critical control points for its biosolids management activities throughout the biosolids value chain;
5. Include or cross-reference all operational controls, procedures, processes, and other management methods used to achieve and maintain compliance with legal and other requirements; and
6. Describe those biosolids management activities assigned to and performed by contractors.

#### ***Element 2 — Biosolids Management Policy***

The organization shall establish a biosolids management policy that commits the organization to following the principles of conduct set forth in the *NBP Code of Good Practice* and may include other biosolids commitments the organization voluntarily chooses to adopt.

The organization's biosolids management policy shall be communicated to employees, contractors, and all interested parties and be incorporated into the organization's biosolids programs, procedures, and practices.

## Planning

### ***Element 3 — Critical Control Points***

The organization shall identify and document the critical control points of its biosolids management activities throughout the biosolids value chain. The organization shall also identify potential or actual environmental impacts at each critical control point.

The organization's critical control points shall be consistent with those identified in the NBP's *National Manual of Good Practice* and other authoritative sources on biosolids management. The information on the organization's critical control points shall be kept up to date and the records shall link each critical control point and its potential environmental impacts with the corresponding operational control(s).

Organizations that have successfully completed a third-party verification audit and are pursuing NBP Platinum-level Certification shall provide notification to the third-party verification auditor after any operational change that requires a change to the identified critical control points or to environmental impacts associated with the critical control points.

### ***Element 4 — Legal and Other Requirements***

The organization shall establish a procedure for identifying and tracking legal (federal, state, and local) and other requirements applicable to its biosolids management activities. The procedure shall include a management process for incorporating changes and new requirements into the elements of its BMP. The organization shall establish and maintain records of applicable legal and other requirements.

### ***Element 5 — Goals and Objectives***

To continually improve the performance of its BMP, the organization shall establish and periodically review measurable biosolids program goals and objectives for its biosolids management activities. The organization shall set measurable goals and objectives for each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.

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 (e.g., Water Environment Federation manuals of practice).

The biosolids program goals and objectives also shall consider input from interested parties developed through proactive public participation.

The biosolids program goals and objectives shall be integrated with other BMP Elements and its biosolids management activities, developed and documented using SMART criteria (i.e., be Specific, Measurable, Achievable, Relevant, and Time-bounded), and shall be updated on a regular basis.

The organization shall establish an action plan that describes those improvement activities it is pursuing to achieve its biosolids program goals and objectives. The action plan shall designate schedules, milestones, resources, and responsibilities for achieving its biosolids program goals and objectives.

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

The organization shall select and implement a proactive public participation approach to involve interested parties in its biosolids management program and BMP planning process. The approach selected for public participation shall reflect the organization's commitments to ten (10) principles in the NBP *Code of Good Practice*, including its plan for independent third-party verification of conformance with the *BMP Elements*. The public participation approach shall be consistent with the degree of current public interest, the history of public involvement, the method of biosolids management, and related local circumstances.

The approach selected for public participation also shall provide interested parties with meaningful opportunities to express their views and perspectives relative to the organization's biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement.

The organization shall consider input from interested parties in initially developing its biosolids program goals and objectives during its BMP implementation and in updating them as part of its periodic review of BMP performance.

## **Implementation**

### **Element 7 — Roles and Responsibilities**

The organization shall establish and maintain records of the assigned roles and responsibilities for its BMP and biosolids management activities. To ensure these assigned roles and responsibilities are effectively performed, the organization shall:

1. Appoint an individual with overall responsibility for ensuring that its BMP is implemented and maintained;
2. Define and document roles and responsibilities of its employees for performing its biosolids management activities and BMP functions;
3. Provide the human, technical, and financial resources necessary to execute these responsibilities effectively; and
4. Define and document the roles and responsibilities of contractor(s) retained to perform various biosolids management activities and BMP functions through service agreements.

### **Element 8 — Training**

The organization shall establish and maintain a training program to ensure that its employees responsible for specific biosolids management activities and for

implementing various BMP functions are competent in performing their assigned tasks and duties.

The training program shall provide general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the entire biosolids value chain. The training program shall address new or reassigned employees. The organization shall maintain records of individual employee training delivered and completed.

The organization shall require that its contractors establish their own training programs consistent with their roles and responsibilities in biosolids management activities as defined through service agreements.

### ***Element 9 — Communication***

The organization shall establish and maintain a proactive communications program that provides on-going information about its biosolids management activities and BMP to interested parties and the public, consistent with local circumstances, the method of biosolids management, its public communications history, and degree of current interest in its biosolids management activities. The organization's communication program shall make available a summary of its independent, third-party BMP verification audit results to the public. The organization shall define the roles and responsibilities of outside contractors in its communication program.

The communication program shall include a procedure for receiving inquiries and requests for information from interested parties about its biosolids management activities and BMP. The procedure shall define a process for ensuring a timely and complete response to inquiries by interested parties. At a minimum, the organization's communications program shall make the following information about the organization's biosolids management activities and BMP available to interested parties:

1. Biosolids management policy;
2. Applicable legal and other requirements;
3. Biosolids program goals and objectives for continual improvement;
4. Periodic BMP performance report; and
5. Detailed report of its independent, third-party verification audit results of its BMP.

The organization's communications program also shall communicate relevant information about its biosolids management activities and its biosolids management policy and all 17 BMP Elements to its employees and outside contractors, consistent with their assigned biosolids management roles and responsibilities.

### ***Element 10 — Operational Control of Critical Control Points***

The organization shall develop and implement standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts

effectively. Operational controls at critical control points shall incorporate all legal and other adopted requirements and shall consider applicable best-management practices as defined in various authoritative information sources on biosolids management (e.g. NBP *National Manual of Good Practice*, Water Environment Federation manuals of practice).

Operational controls shall include appropriate preventive maintenance procedures and work management systems for maintaining equipment, instrumentation, vehicles, and other treatment technology and process control systems associated with its biosolids management activities.

The organization shall require that its contractors establish their own operational controls consistent with their roles and responsibilities in biosolids management activities.

### ***Element 11 — Emergency Preparedness and Response***

The organization shall establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

The organization shall review and evaluate the effectiveness of its emergency preparedness and response procedures, including communications systems, and revise them as necessary. All emergency response equipment shall be on site or readily available within a minimum response time.

The organization shall require its contractors to establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

### ***Element 12 — Documentation, Document Control and Recordkeeping***

The organization shall establish and maintain documentation, documents, and records for its BMP including the 17 BMP Elements.

The organization shall establish and maintain document control procedures and practices to ensure that its BMP documentation and documents are:

1. Available and can be located easily;
2. Created following established document creation protocols;
3. Kept up to date through periodic reviews and revisions (if applicable);
4. Properly marked with version number, effective date(s), and references to replaced or superseded versions; and
5. Approved by authorized personnel.

The organization shall establish and maintain records of its biosolids management activities and ensure that they are:

1. Available and can be located easily; and
2. Retained for the specified period of time.

The organization shall establish BMP documentation, document control, and records requirements for biosolids management activities conducted by its contractors in service agreements, and incorporate these requirements into its BMP.

## **Measurement and Corrective Action**

### ***Element 13 — Monitoring and Measurement***

The organization shall establish and maintain regular monitoring and measurement procedures and practices for all of its biosolids management activities to:

1. Ensure compliance with applicable legal and other requirements;
2. Measure biosolids program performance at critical control points; and
3. Track progress toward achieving its biosolids program goals and objectives as required under Element 5.

Monitoring and measurement results shall be recorded and the records maintained as established in the recordkeeping procedures under Element 12.

The organization shall require its contractors to establish and maintain regular monitoring and measurement procedures and practices for all their assigned biosolids management activities, as defined in their service agreements.

### ***Element 14 — Nonconformances: Preventive and Corrective Action***

#### **Procedures for Investigating and Taking Corrective Action for Nonconformances**

The organization shall develop and implement a procedure to:

1. Investigate any noncompliance with applicable regulatory requirements and/or nonconformance with internal BMP procedures identified during routine monitoring and measurement or periodic internal BMP audits;
2. Identify the cause and take actions to correct the nonconformance; and
3. Document the necessary corrective actions taken to prevent a recurrence.

#### **Corrective Action Plans for Nonconformances**

Corrective action plans shall be developed to address nonconformances identified during routine monitoring and measurement. Such plans may be as brief as is appropriate to the situation, but at a minimum, shall identify the nonconformance, the root cause(s), and the corrective action being taken. The corrective action plan shall identify changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances.

### **Corrective Action Plans for BMP Audits**

Formal corrective action plans shall be established to address the findings of internal BMP audits under Element 16, and BMP verification audits conducted by third parties. The corrective action plan shall be documented, and shall describe what actions will be taken to address the audit findings, the individual(s) responsible, the estimated completion date, and required resources to develop and implement corrective and preventive action.

Progress in completing the corrective actions shall be tracked and periodically updated to reflect completion. The corrective action plan shall include recommended changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances. These changes shall be documented in the corrective action plan, and in the BMP Manual and other relevant BMP documentation.

### ***Element 15 — Biosolids Management Program Report***

The organization shall complete a periodic, written BMP performance report (at least annually) summarizing the performance of its BMP. The report shall contain appropriate summaries of monitoring, measurement, and other results that demonstrate the performance of the biosolids program relative to its goals, objectives, and legal requirements, including those biosolids management activities conducted by contractors.

The report also shall provide summaries of performance relative to other voluntarily adopted requirements, the organization's progress toward achieving its biosolids program goals and objectives, and a summary of its independent third-party BMP verification audit results and internal BMP audit results.

The periodic BMP report shall be available to the public. The organization shall have the flexibility of using other methods, including electronic methods such as a biosolids program web page in addition to or in lieu of a written periodic performance report.

### ***Element 16 — Internal BMP Audit***

The organization shall establish and maintain an internal audit program to periodically analyze its BMP and to determine whether it is effectively meeting its biosolids management policy, program requirements, and program goals and objectives.

The internal BMP audit program shall define the scope, frequency, and methodology of the audits, assign responsibility for conducting the audits and communicating their findings, and designate individuals to whom these findings are to be conveyed. The internal BMP audit also shall evaluate the organization's performance relative to established biosolids program goals, objectives, and performance measures. The internal audit program shall cover all the organization's biosolids management activities including those performed by contractors.



Internal audit results shall be reported to the organization's management in such a way that it can take action to make necessary modifications to the BMP. The person responsible for the BMP shall develop, or delegate the development of, a comprehensive corrective action plan addressing each nonconformance identified by the internal audit.

At a minimum, the organization shall maintain the following documents and records, as applicable, relating to its audit program:

1. Description of audit methodology, protocol, scope, and schedule;
2. Identification of lead auditor(s), qualifications, and description of roles and responsibilities of auditor(s), management representatives, and others who may participate in, review, or be expected to act upon the audit; and
3. Corrective and/or preventive action plans prepared resulting from an audit, and any related changes made to policies, plans, procedures, or work practices that occur as a result of an audit's findings, evaluation, or follow-up actions.

*[For organizations that are pursuing NBP Gold-level Recognition, internal audits are required annually, with reports sent to NBP as part of the periodic BMP report. Organizations that are pursuing the NBP Platinum-Level Certification should set a schedule and scope of internal audits. This schedule will be reviewed and approved by the third-party auditor.]*

## **Management Review**

### **Element 17 — Management Review**

The organization's management shall, at intervals that it determines appropriate, review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures to ensure its continuing suitability, adequacy, and effectiveness. A lead person or persons shall be responsible for organizing and conducting the review.

The management review shall address the possible need for changes to policy, the goals and objectives, biosolids management activities, or other BMP Elements based on internal audit results, external verification audits by third parties, changing circumstances, and the commitment to continual improvement. The management review shall be documented. Any changes to policies, plans, procedures, and work practices that are made as a result of the review also shall be documented.

At a minimum, the organization shall maintain the following related to its management reviews:

1. Schedule and scope for review(s);
2. Documentation of findings, evaluation, and follow-up actions; and
3. Documentation of changes made to policies, plans, procedures, practices, or other BMP Elements that occur as a result of the management review findings, evaluation, or follow-up actions.