Designation: E2541 – 10

Standard Guide for Stakeholder-Focused, Consensus-Based Disaster Restoration Process for Contaminated Assets[1]

This standard is issued under the fixed designation E2541; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 To ensure a publicly acceptable and timely restoration of an asset contaminated as a result of a natural or man-made disaster, including a terrorist event, it is essential to have a pre-planned strategy developed and tailored at the community level and facilitated by the government which advocates the support and involvement of the affected community during such a crisis period. This pre-planned strategy for restoration will need to be seamlessly incorporated into the overall emergency management process within the community. This guide presents a framework (that is, strategy) for involving the public in a stakeholder-focused, consensus-based event restoration process, for those situations where such involvement is essential to move a stalled (due to stakeholder issues) restoration process forward. This framework is designed to be an event-specific, community-specific process to help prioritize and consider actions necessary to optimize the restoration of an asset contaminated as the result of a disaster.

1.2 This guide is intended to describe a highly flexible restoration planning process, and therefore does not specify or recommend a specific course of action for this activity.

1.3 This guide is intended to assist in the implementation of a restoration planning process allowing a holistic assessment and balancing of the impacts associated with human health, ecology, socio-cultural values, and economic implications. It is intended to be used in alignment with current Federal Emergency Management Agency (FEMA) guidance and other guides and agency procedures and requirements to address specific stakeholder issues and concerns.

1.4 After completing the immediate response and stabilization phase of a disaster that required Federal assistance through establishment of a Joint Field Office (JFO) in accordance with the National Response Plan, mitigation and recovery activities will need to be planned and initiated to address the significant long-term impacts for any contaminated assets in the affected area. This guide provides a process that can be used by the JFO to gain stakeholder consensus on the restoration of these assets.

1.5 The user should consult other restoration-related standards, regulations, and sources for specific methods in the utilization of predictive models or other analysis tools that may be required under a restoration planning assessment.

1.6 Although the implementation of a restoration planning process is intended for use after a disaster occurs, it needs to be an integral part of a community's pre-event planning activities and incorporated into appropriate community response plans. Identifying the important assets of a community and key stakeholders associated with each respective asset, before an event occurs through a process such as Community Asset Mapping, will help ensure a more efficient restoration process following an actual contamination of the asset in a disastrous event.

1.7 Since restoration planning as proposed in this guide follows a plan established prior to the event, it is important to coordinate asset restoration plans with event preplanning on how to minimize damages to significant assets from uncertain, low-probability, but potentially costly natural and man-made disasters. What will be required for asset restoration will be in part dependent on what measures have been taken to protect those same assets before the extreme event occurs. Guide E2506 provides a three-step protocol for formulating and evaluating risk mitigation strategies for constructed facilities. Assets identified for risk mitigation in the application of Guide E2506 prior to a disaster will likely be assets that the restoration stakeholders using this guide will want to consider restoring in the recovery phase following a disaster.

1.8 *This standard guide does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard guide to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

[1] This guide is under the jurisdiction of ASTM Committee E54Homeland Security Applications and is the direct responsibility of Subcommittee E54.02Emergency Preparedness, Training, and Procedures.

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2. Referenced Documents

2.1 *ASTM Standards:*[2]

E917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems

E964 Practice for Measuring Benefit-to-Cost and Savings-to-Investment Ratios for Buildings and Building Systems

E1074 Practice for Measuring Net Benefits and Net Savings for Investments in Buildings and Building Systems

E1739 Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites

E1765 Practice for Applying Analytical Hierarchy Process (AHP) to Multiattribute Decision Analysis of Investments Related to Buildings and Building Systems

E1984 Guide for Brownfields Redevelopment (Withdrawn 2012)[3]

E2348 Guide for Framework for a Consensus-based Environmental Decision-making Process

E2506 Guide for Developing a Cost-Effective Risk Mitigation Plan for New and Existing Constructed Facilities

2.2 *Other Documents:*

(SARA Title III, 42 U.S.C. §11001 et seq.) Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986

(Act 1990-165, 35 P.S. \§6022.101 et seq.) Hazardous Material Emergency Planning and Response Act

NRP 2004 *National Response Plan*, including the Nuclear/Radiological Incident Annex, Emergency Support Function #10 (Oil and Hazardous Materials Response Annex) and Emergency Support Function #14 (Long-Term Community Recovery and Mitigation Annex). December, 2004. U.S. Department of Homeland Security, Washington, D.C.

P/CCRARM (The Presidential/Congressional Commission on Risk Assessment and Risk Management). 1977a. Risk Assessment and Risk Management in Regulatory Decision Making. Volume II, Washington, D.C.

P/CCRAM (The Presidential/Congressional Commission on Risk Assessment and Risk Management). 1997b. Framework for Environmental Health Risk Management. Final Report. Volume I, Washington, D.C.

3. Terminology

3.1 *Definitions:*

3.1.1 *affected stakeholder, n*—any individual, group, company, organization, government, tribe, or other entity which may be directly affected by the outcome of the specific restoration planning process.

3.1.2 *asset, n*—property of a community to which (for purposes of this standard) a high monetary, ecological, or socio-cultural, or a combination thereof, value can be assigned, but which has no essential service or critical infrastructure function within the community. (There would be no need for this consensus-based restoration process in cases where complete restoration of critical infrastructure is obligatory.)

3.1.2.1 *Discussion*—Some examples of assets include statues and monuments, historical landmarks, forests and nature preserves, watersheds, parks and recreational areas, cultural and archaeological sites, sports and entertainment pavilions, tourist attractions, government facilities, roads, streets, bridges, utilities, dams, and infrastructure.

3.1.3 *community, n*—group or groups of individuals, who live or work in specific neighborhoods, areas, or regions.

3.1.4 *community asset mapping, v*—documenting the tangible and intangible resources of a community where assets are to be preserved and enhanced.

3.1.5 *informed consent, n*—agreement reached between the responsible party(ies) and the affected stakeholders, which is obtained by a process by which affected stakeholders (*1*) are informed about the issues, concerns and priorities of all other affected stakeholders; (*2*) are directly involved in developing criteria for selecting solution(s); and (*3*) consider the balancing of trade-offs to achieve procedurally defined consensus on specific initiatives and actions identified through the restoration planning process.

3.1.5.1 *Discussion*—Multi-criteria decision analysis methods can be useful in sorting through and resolving differences among stakeholders with diverse opinions to help reach informed consent. (See Practice E1765 for help in multi-criteria decision analysis.)

3.1.6 *interested party, n*—any individual, group, company, organization, or other entity which is not an "affected stakeholder" but which is interested in the outcome of the particular restoration planning process.

3.1.7 *regulator, n*—local, regional, state/provincial, or federal government agency or person employed therein for the purpose of administering or enforcing compliance with laws and regulations, which may be a stakeholder, a decision-maker, or an advisor to the responsible party's(ies') lead Stakeholder Committee.

3.1.8 *responsible party(ies), n*—specific Federal, State, local, or tribal government, private sector or non-governmental organization(s) designated to be responsible for the restoration of an asset that was contaminated in a disastrous event.

3.1.8.1 *Discussion*—For example, upon request, the Federal government assists State, local, and tribal governments to develop and execute recovery plans. In accordance with the National Response Plan, the Environmental Protection Agency may be designated as the Emergency Support Function Coordinator and consequently the "responsible party" when a disaster results in the spread of radiological contamination or other hazardous materials.

3.1.9 *restoration, n*—returning the assets of a community to a normal, natural, or healthy condition as determined through a structured framework of decision making and community action.

3.1.10 *stakeholder committee, n*—entity lead by the responsible party(ies) which is directly involved in the decisions made within the restoration planning process.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

3.1.10.1 *Discussion*—It is composed of affected individuals or representative(s), or both, selected from each group of stakeholders. Members of the Stakeholder Committee are responsible to act as liaisons with their respective stakeholder groups.

3.1.11 *stakeholder consensus on disaster restoration planning process, n*—responsible party(ies)-led and stakeholder-involved, community-specific process to help assess, prioritize, and select restoration actions to be implemented with the goal of optimizing the restoration of an affected asset following a disastrous event, which considers and balances the full spectrum of human health, ecological, socio-cultural, and economic impacts.

3.1.11.1 *Discussion*—In the National Response Plan example given above, the Joint Field Office would serve as the central coordination point among Federal, State, local, and tribal agencies and voluntary organizations for this restoration planning process as well as for delivering recovery assistance programs.

4. Summary of Guide

4.1 *The Stakeholder*—Focused Consensus-Based Event Restoration Planning Process is a responsible party(ies)-led, stakeholder-focused, event-specific, and community-specific process established to help assess, prioritize and select optimized and timely actions to effect the efficient restoration of a contaminated asset to its original or agreed upon altered condition and use. The restoration planning process is designed to consider and balance the event's implications on human health, ecology, socio-cultural values, and economic impacts. The Stakeholder Committee, established by the responsible party(ies), will consider issues related to environmental justice, which relates to the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin or education level. The restoration planning process is an iterative process comprised of five main steps: (*1*) affected stakeholder identification and formation of the Stakeholder Committee; (*2*) information gathering; (*3*) forecasting; (*4*) establishment of informed consent; and (*5*) implementation and evaluation of initiatives.

4.2 The restoration planning process focuses on the holistic assessment of the impacts of any event restoration project. By utilizing effective, science-based tools and active involvement of affected stakeholders, the responsible party(ies) (with assistance from the affected stakeholders) can readily identify and manage the most important issues related to the timely and acceptable restoration of the affected asset.

4.3 There is no set prescriptive path that can be universally followed when initiating or participating, or both, in the restoration planning process. The process must be tailored to meet the specific needs of the affected community and conditions of the disaster. Depending on the needs and priorities dictated by the specifics of the disaster, different analysis tools may be needed to address specific issues.

5. Significance and Use

5.1 The understanding and management of the interrelationship between human health, ecological condition, socio-cultural values, and economic well-being of the community and the high-value asset is essential to timely and acceptable restoration. This standard guide is designed to help responsible party(ies) with the identification and integration of affected stakeholders and with the establishment of a process to identify and resolve key issues essential to a satisfactory restoration. The standard guide is presented herein as a "framework" to help ensure that all the restoration planning process components (that is, human health, ecological condition, socio-cultural values and economic well-being) are considered. The framework is designed to allow a user to determine which components of the process are applicable to the restoration problem being addressed, and to establish the level of analytical detail necessary for each component. It provides general guidance to help with the selection of approaches and methods for specific analysis of each of the major restoration planning components (that is, human health, ecological condition, socio-cultural values, and economic well-being).

5.2 By actively involving affected stakeholders in the restoration decision-making process, it will help the user to orient the process to prioritize and consider the most important issues of those who's lives are most directly impacted by the consequences of the event and resulting restoration. This not only greatly increases the chances of a successful and acceptable restoration, but will also help promote public trust in the responsible party's ability to rapidly restore the high-value asset(s).

6. Consensus-Based Disaster Restoration Decision-Making Framework

6.1 *Identification of Affected Stakeholders and Formation of a Stakeholder Committee:*

6.1.1 Stakeholders are at the center of the restoration planning process, and are involved from the planning through the implementation phases, providing input at the issue identification, decision-making, and restoration stages. The affected stakeholders are key contributors to decision-making, rather than just providing feedback about decisions made by others.

6.1.2 It is necessary to both identify and involve all the key affected stakeholders and interested parties. An active two-way communication process is essential and required to identify key stakeholders early in the process. Affected stakeholders generally fall into three broad categories: (*1*) the community (for example, the occupants of the building(s)/asset(s), localized general public, non-governmental organizations with a direct stake, investors and investor organizations); (*2*) government (for example, municipal, regional, tribal, state/provincial, or federal, or a combination thereof, responsible agencies, and regulatory agencies); and (*3*) commercial (for example, private owners, local businesses, and industry). These groups should be invited to select a representative(s) to participate on the Stakeholder Committee; the most effective representatives are those people selected by the respective group or organization itself. There may be a representative(s) of several organizations within each category (for example, there may be two main owners or organizations with the most at stake; there may be three government agencies which require representation; there

may be two primary regulatory agencies with direct responsibility, etc.). Each member of the Stakeholder Committee is responsible to act as liaison with their respective stakeholder group.

6.1.3 Construction of a "stakeholder map" is an effective technique to guide the stakeholder identification process (for example, Fig. 1). The map for a particular restoration planning process should be tailored to the address specific features of the process, which requires broad insights into the local and regional values and cultures that may be affected by the restoration process. Most importantly, the map should be recognized as a "living" document, subject to amendments as needed throughout the life of the process.

6.1.4 Delineations of different spokes of the map are not intended to infer or anticipate stakeholder-specific agendas regarding potential issues related to the process; but rather to guide all participants toward ensuring completeness in representation of stakeholder groups. Refinements to the map should be made as participants identify different relationships or additional individuals or groups. The External Affairs Officer (NRP 2004) may also be useful in helping to identify stakeholders in an event for which a Joint Field Office was established in accordance with the National Response Plan.

6.1.5 Responsible party(ies) should designate a dedicated chairperson for the Stakeholder Committee. The Chairperson should be provided with the necessary resources and authority by the responsible party(ies) to effectively manage and work the issues of the committee. The Chairperson also should possess sufficient skill in facilitation of group interactions.

6.1.6 In order for the Stakeholder Committee to function optimally, it should establish ground rules for its operations and its members. The basic ground rules are honesty of communication, respectful conduct for disagreements, clear understanding of how informed consent will be reached, and clear delineation of their role in the decision-making process. Ground rules should be established by the group for: (*1*) how communications will be managed; (*2*) how information and decisions will be documented; (*3*) how to deal with a deadlock on an issue; and (*4*) how responsible party(ies) will control the data and information generated after the restoration planning process is completed.

6.1.7 The restoration planning process should proceed once the affected stakeholders have been identified, contacted, and the Stakeholder Committee formed with representation from each affected stakeholder group (Fig. 2).

6.2 *Information Gathering:*

6.2.1 Once the Stakeholder Committee has been formed, the restoration planning process continues with the Information Gathering Step (Fig. 3). In this step, information is gathered on the event, status of the asset, extent of contamination, stakeholder issues, perceptions, preferences and constraints. Information hand-off from the first-responder and event stabilization activities will serve as an initial information base from which to work. It will be important to discover, gather, and manage specific stakeholder issues and concerns. Information is compiled on issues relevant to the specific restoration planning process (for example, current health status, contamination status and issues, social issues, cultural factors, economic status and well-being at stake, or other event-specific factors, as appropriate to the disaster). Identification of issues is critical as this information will form the basis of the assessment effort within the Forecasting step of the framework.

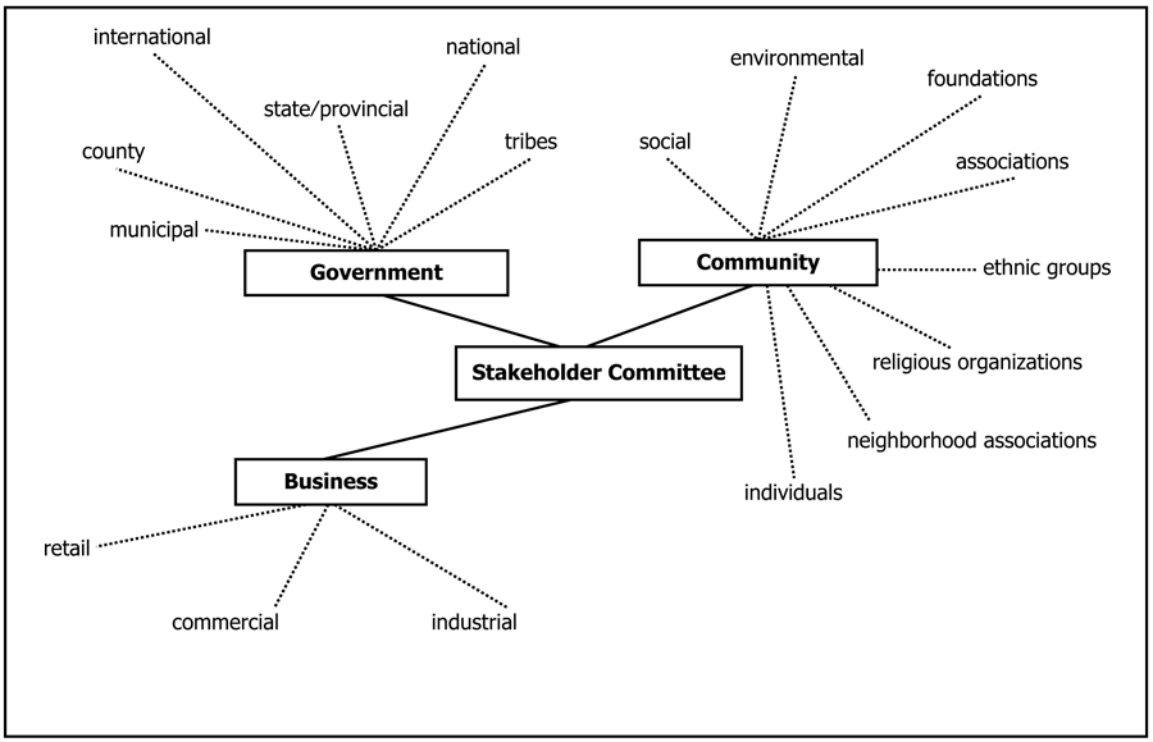

FIG. 1 Generic Example of Stakeholder Map Intended to Guide Identification and Notification of All Appropriate Participants

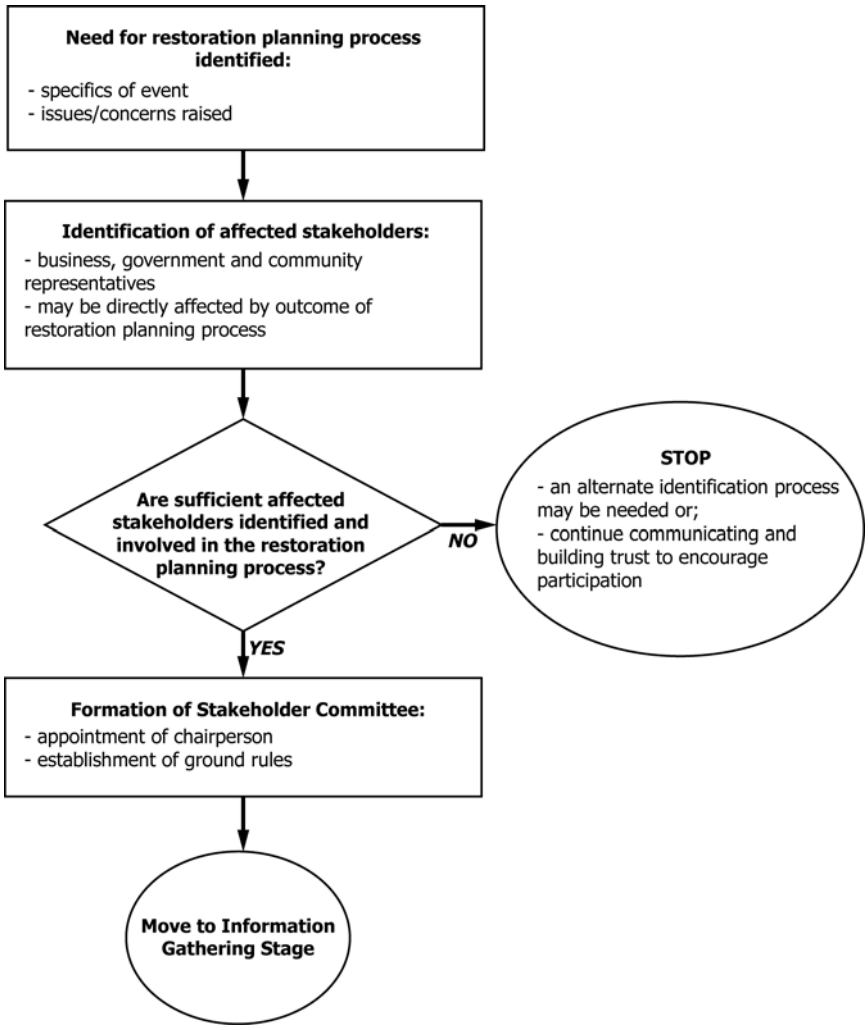

FIG. 2 Stakeholder Committee Formation

6.2.1.1 It is important to determine the present condition of the asset in relation to the local economy, human health, the effected ecology, and the socio-cultural issues associated with the event and the asset in question. If adequate information/data do not exist regarding the above aspects, then focused data collection might be necessary at this point in the process. If it is determined that data cannot be gathered for a certain area of emphasis, then it might be necessary to reassess the stakeholders' priorities to find another method in which to capture this information.

6.2.1.2 It is important to understand the extent of contamination present throughout the contaminated asset. In determining the extent of contamination it will be necessary to examine the complete asset. It may be helpful to logically divide a complex asset into smaller potential isolation groupings/areas. This will provide the Stakeholder Committee valuable information to consider selective early decontamination and restoration, for critical groupings/areas with lower levels that can be more readily restored to safe levels. Groupings/areas with higher levels or more complex decontamination needs might be considered as separate areas for isolation, allowing at least a portion of the overall asset to be returned to service earlier. Understanding the full extent of contamination is an essential first step toward planning for decontamination and restoration. Determining the extent of contamination is one of the areas the Stakeholder Committee will likely need the involvement of technical experts.

6.2.1.3 As critical as understanding the extent of the contamination, is the understanding of underlying stakeholder issues, perceptions, and preferences. Following an incident, stakeholders who have been directly affected by the event and the resultant contamination will have very specific concerns and fears regarding the restoration of the asset. Some of which may be addressed by sound technical analysis and planning, but others will involve perceptions and social issues that can not be resolved by sound technical analysis and planning. These more nebulous concerns will require a good understanding of the underlying values behind these perceptions and fears. It may require the acquisition of professional consultants with expertise in behavioral and social sciences to help the Stakeholder Committee work with these stakeholders to understand their values and incorporate them into a sound restoration plan. Once people believe their real issues and values have been heard and are being considered, they will be more open to considering the full spectrum of factors (that is, economic,

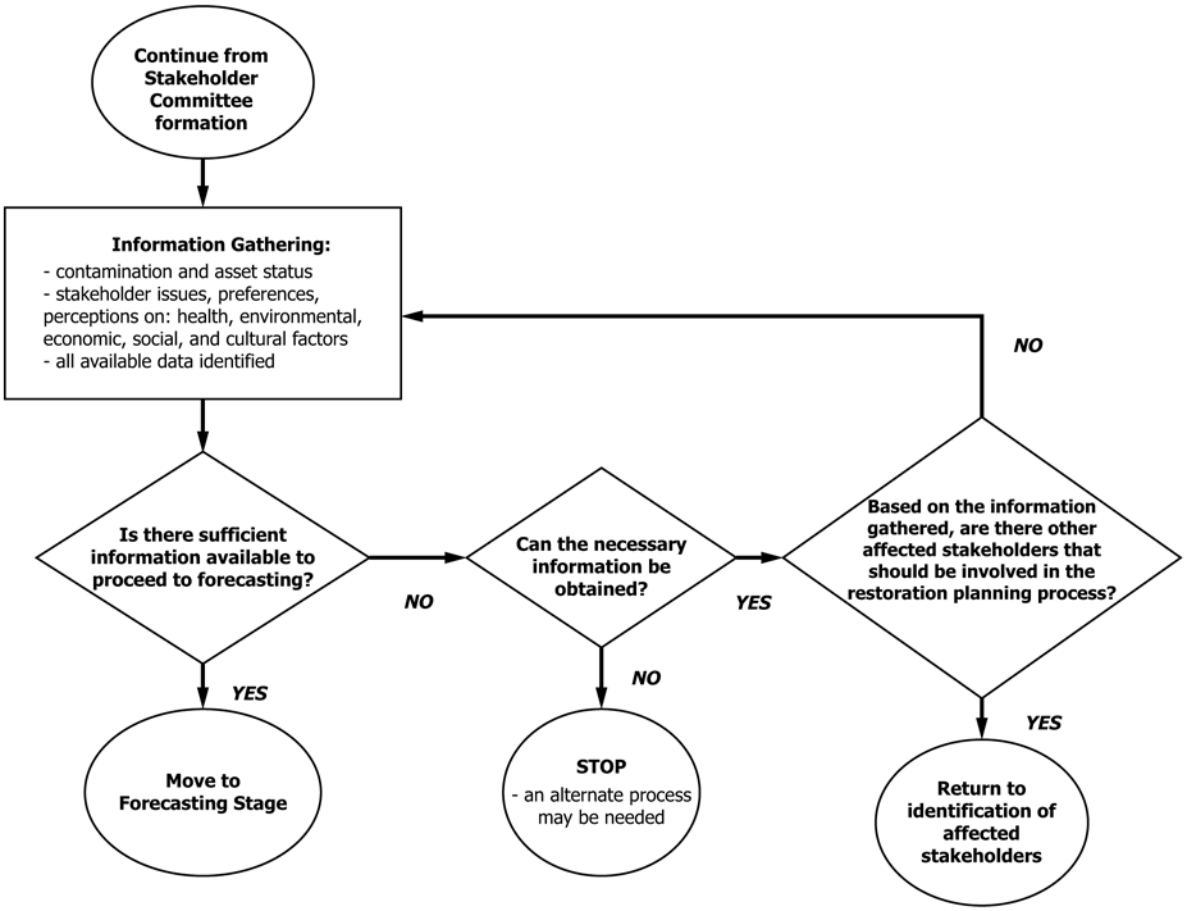

FIG. 3 Information Gathering Stage

human health, ecology, and social-cultural) that the Stakeholder Committee will need to balance in planning the restoration.

6.2.1.4 One of the first orders of business for the Stakeholder Committee, after establishing their in-house ground rules, will be identification of the constraints the Committee will have to work under. These are likely to be human health, economic, community-value, legal, local regulation and ordinance, and environmental constraints, to name a few. Also very early on in the process, the Stakeholder Committee will need to establish the acceptable end-point criteria necessary to meet for each component of the analysis (that is, human health, economic, socio-cultural, and ecological) in order to move the restoration planning process forward. The identified constraints will play a key role in determining the specific end-point criteria that must be met. It may also be necessary to re-establish some of the end-point criteria, as the process moves forward. Equally important to identifying the constraints and associated end-point criteria that must be met, is establishing the analytical methods and tests necessary to be reasonably assured that the respective end-point criteria are being met. After proceeding into the analysis of a specific component, it may become apparent that the initially established criteria cannot be met or the chosen analytical methods are not sufficient to ensure it is being met. Thus, this process will likely be iterative in nature. The restoration planning process may proceed to the Forecasting stage after sufficient information has been gathered and the end-point criteria have been met.

6.3 *Forecasting:*

6.3.1 The information gathered to identify asset condition status and stakeholder priorities and values forms the basis for Forecasting. The set of solutions and alternatives for restoring the asset are identified for each individual analysis. Forecasting uses predictive methods and models to describe ranges of end state conditions and possible outcomes that may result from implementing each restoration option. Specific methods and models may be used to predict human health risks (for example, selected ambient dispersion and risk assessment models, selected building dispersion and health impact models, Guides E1739, E1984, E2348, SARA Title III, P/CCRARM, P/CCRAM, U.S. EPA responsible party risk assessment methods and models), ecological effects, economic impacts, cultural impacts, social effects or other impacts. Equally valid alternative paths may be followed when performing these analyses.

6.3.2 The responsible party(ies), in consultation with the Stakeholder Committee, will likely need to hire technical experts to develop and utilize the specific assessment methods and models. Presentation and interpretation of the resulting technical reports may be done by a technical facilitator(s) for the Stakeholder Committee.

6.3.3 Criteria are developed by the responsible party(ies), in consultation with the Stakeholder Committee, to allow for an evaluation of the various impacts and identification and evaluation of affected stakeholder priorities relative to these impacts.

6.3.4 Once possible outcomes are identified, impacts evaluated (Fig. 4), and criteria necessary to continue are clearly defined, the restoration planning process may proceed to the Informed Consent stage.

6.4 *Obtaining Informed Consent:*

6.4.1 Once the necessary analyses have been completed, it is time for the responsible party(ies) to work with the Stakeholder Committee to select a solution or series of solutions. Some of the potential outcomes predicted in the Forecasting step may be mutually exclusive or conflict with other potential outcomes or priorities of other stakeholders. It is necessary to have a shared understanding of the issues and then develop the Informed Consent of the Committee. Because honesty is a ground rule of the Committee, the issues and priorities of all stakeholders must be transparent. Therefore, allowing responsible party(ies) and stakeholders to be able to develop solution-selection criteria and agree to trade-offs is necessary in order to achieve the timely and acceptable restoration of the asset. Decision-assessment tools (for example, multi-attribute utility decision analysis process tools, Practice E1765) can be used at this point to prioritize stakeholder concerns and to help analyze the trade-offs that will be necessary depending on the solution(s) that are chosen. All potential plans and associated outcomes should be available for consideration, and the decision process well documented.

6.4.2 The restoration planning process may proceed once an informed consensus is reached on prioritization of solutions (Fig. 5).

6.5 *Implementation and Evaluation of Restoration Activities*—The preferred restoration solution(s) identified in the Informed Consent Step should be implemented and evaluated. This may involve cost-benefit analysis or other evaluation tools and may need to utilize the expertise of technical and business experts and consultants. (For standard methods of performing benefit-cost analysis and life-cycle costing, see Practices E964 on benefit-cost analysis, E917 on life-cycle costing, and E1074 on net benefits.) The solutions also may require fine-tuning or modification to meet their objectives (Fig. 6).

6.6 *Completion of the Restoration Process*—The restoration process may be completed and closed with the implementation, evaluation, and closure of restoration activities. The responsible party(ies), in consultation with the Stakeholder Committee, will make the determination of when closure will occur.

6.7 *Reiteration of the Process*—The framework is designed to allow the process to be iteratively revisited if new issues or situations arise. For example, if certain stakeholder values were not fully accounted for, then it will be necessary to gather more

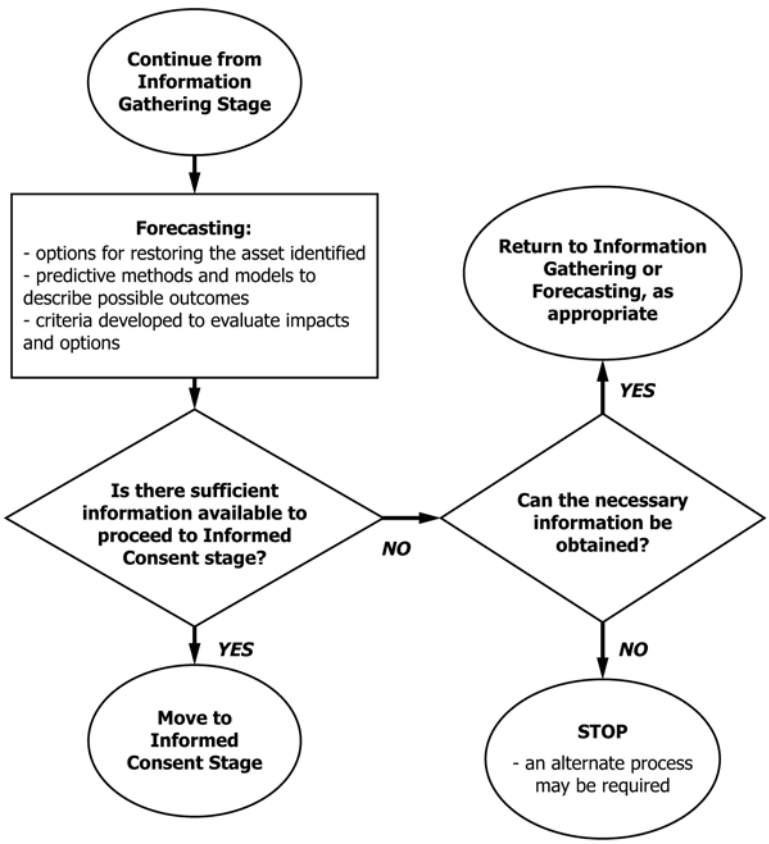

FIG. 4 Forecasting Stage

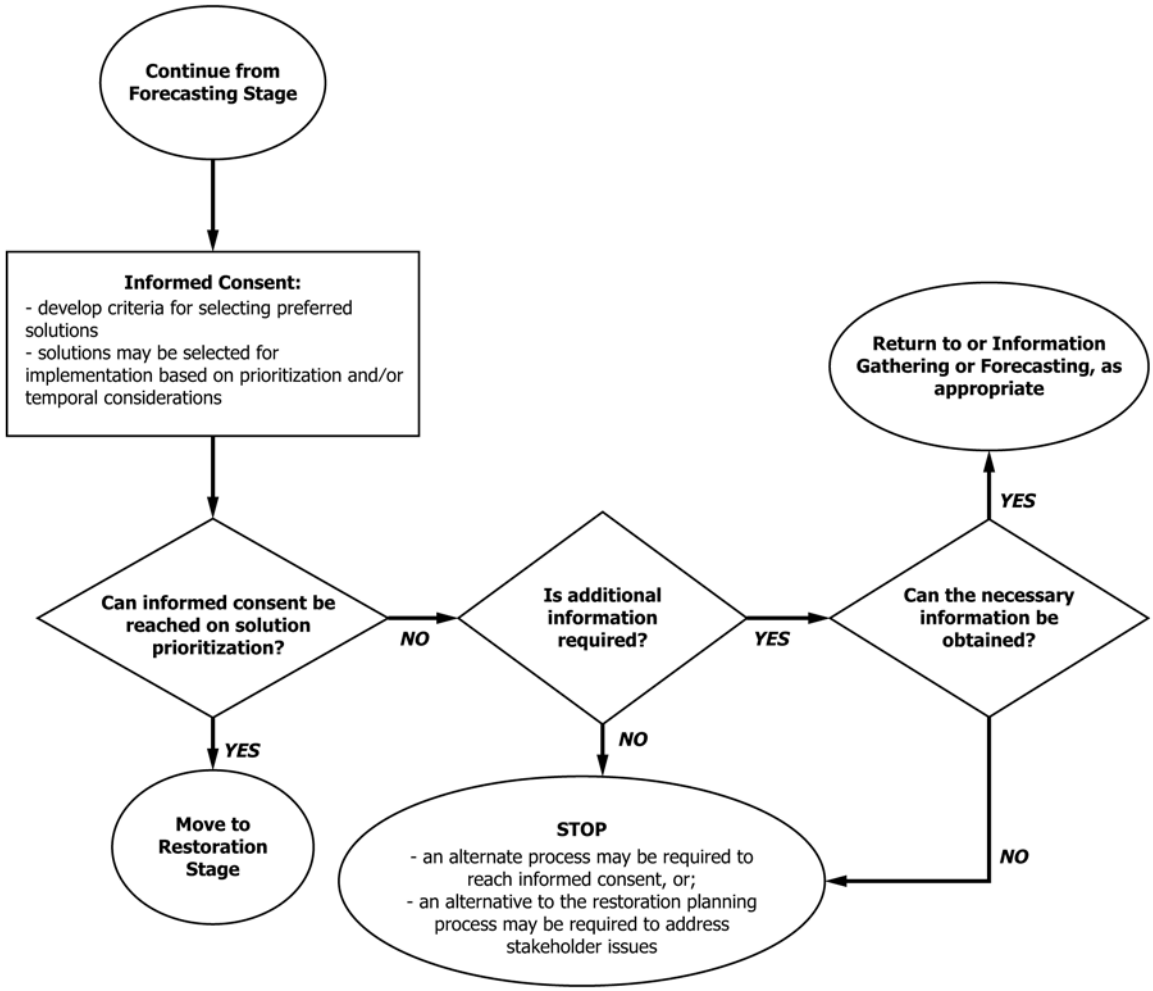

FIG. 5 Informed Consent Stage

information and perform more analyses before making and implementing a restoration decision. That is, the process can undergo any number of iterations at any point in the process, giving the flexibility to revisit earlier stages of the process when new findings are available or new issues arise.

7. Keywords

7.1 asset restoration; consensus-based disaster restoration; public communication; public consultation; stakeholder involvement

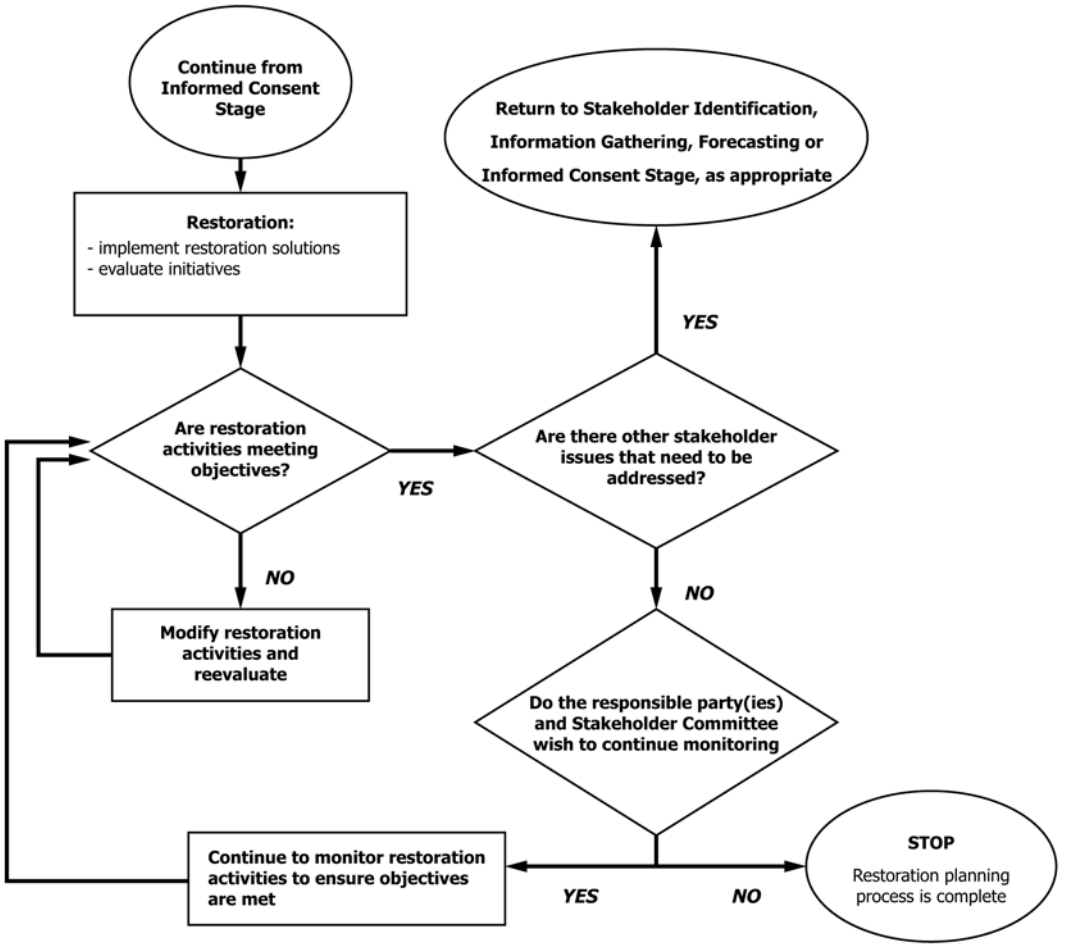

FIG. 6 Restoration Stage