

# CHAPTER 3

## STAGES OF PROJECT DEVELOPMENT

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### 1. INTRODUCTION

Estimates are produced throughout the life of a project at various stages. It is important to understand the stages of project development in order to understand how they relate to the various estimates. Chapter 4 describes the various estimates and their relationship to each other as well as to the key decisions. All projects, whether they are conventional construction or Environmental Management (EM), evolve through a series of stages. Both types of projects originate with preliminary study and then follow a series of design stages. Finally, the design is implemented in the form of a finished product.

Regardless of the finished product, all projects will require management and support activities throughout the life of the project. Major differences between these two types of projects are observed in the study and design phases. EM projects tend to have more intricate study and design phases than those of conventional construction projects. Also, EM projects are unique in that each complete project is divided into two parts: assessment and cleanup. Each part of an EM project is comprised of a complete cycle of study, design, and implementation; hence, the cycle is completed twice for the completion of a single project, whereas the cycle is only completed once for construction projects. A comparison of activities involved in conventional construction and EM projects is provided in Table 3-1. Also included is Table 3-2, Comparison of EM Project Phases to conventional construction phases.

### 2. RELATIONSHIP OF STAGES OF DEVELOPMENT TO TYPES OF ESTIMATES

The development of a project occurs in three major stages: study, design, and implementation. As a project develops, more information and specifications are required,

**TABLE 3-1**  
**EM AND CONVENTIONAL CONSTRUCTION**  
**TERMINOLOGY CROSSWALK**

	<b>DOE ASSESSMENT AND CLEANUP PHASE TERMINOLOGY</b>	<b>4700.1 TERMINOLOGY CONVENTIONAL CONSTRUCTION</b>
<b>STUDY</b>	Preliminary Assessment  Inspection	Development Phase  Conceptual Design Report
<b>DESIGN</b>	Characterization  Evaluation of Cleanup Alternatives	Title I  Title II
<b>IMPLEMENT</b>	Cleanup Action  Compliance	Construction/Title III  Operations

resulting in more estimates than were included in the previous stage. These estimates become a more accurate representation of the actual project cost. In the following, a description of conventional construction terminology will be discussed in relation to the project stages of development and their estimates.

#### **A. Study Stage**

The study stage consists of a development phase and a conceptual design report (CDR). Investigations and studies are conducted to compile the information that is essential for the design stage. Through these investigating processes, planning feasibility study estimates are derived for preliminary budget estimates of total project cost on the basis of any known research and development requirements. This preliminary phase establishes the scope, feasibility, need, and activities included in

the CDRs, which results in a budget/conceptual design estimate, which is used to request congressional authorization for funding.

#### **B. Design Stage**

The design stage consists of the Title I and the Title II phases. The Title I (preliminary) design phase defines the project criteria in greater detail, permitting the design process to proceed with the development of alternate concepts and a Title I design summary. The approved Title I concept and the supporting documentation prepared for Title I form the basis of all activity in the definitive phase, Title II of project design. Title II incorporates all the restudy and redesign work, the final specifications and drawings for bids from contractors, and the construction cost estimator along with analyses of health and safety factors. Moreover, the coordination of all design elements and local and government agencies is also included.

The Title I and Title II phases are used to prepare the most accurate estimate possible prior to competitive bidding and construction. Title I estimates shall include all items referred in the CDR estimate basis. The Title II estimate uses the Title II design for its basis. The Title II estimate may be used for the government's estimate.

#### **C. Implementation Stage**

The implementation stage consists of construction, Title III, and operational phases. This is the time during which actual work and operations are performed. Current working estimates are required throughout the life of the project for cost control. These estimates reflect the most recent cost and data design available, the estimated cost to complete, the allowance for contingency, detailed contingency analysis, and the uncertainties remaining in the project.

#### **D. EM and Conventional Construction Stages**

The terminology of EM and conventional construction stages may differ, but the same basic structure of project development is evident as depicted in Table 3-1, which compares the stages of a project using DOE Order 4700.1, PROJECT MANAGEMENT SYSTEM, terminology with one using EM terminology.

### **3. NATIONAL ENVIRONMENTAL POLICY ACT ACTIVITIES**

The stages of project development will include a number of engineering and scientific studies that address design, technical, and regulatory issues. Environmental assessments (EAs) are conducted to meet the requirements of the National Environmental Policy Act (NEPA). The objective of an EA is to determine if a proposed action or project will have a significant impact on the environment, to assess that impact, and to identify alternatives.

In conventional construction, this step occurs in the Pre-Title I phase of project development. For EM projects, this step occurs in the latter part of the assessment phase.

#### **A. Environmental Assessments**

The objective of an EA is to determine if a proposed action will have a significant impact on the environment and to assess that impact. If an EA results in a finding of no significant impact (FONSI), a notice is published in the Federal Register to that effect. If there is a significant impact or if there are objections to the FONSI, an environmental impact statement (EIS) may be required. An EA can include the following elements of work.

1. Planning and coordination of the EA process, in which potential sources of data are identified and the scope of the proposed action is reviewed.
2. Inventory of natural, human, and cultural resources based on existing sources of information. Typical elements of the resource inventory include geology, hydrology, vegetation, wildlife, threatened and endangered species, air quality, land use (existing and planned), visual characteristics, socioeconomic character, and acoustic conditions. Cultural resources include archaeological sites, historical sites, sites with religious or social significance, and other structures or areas with cultural significance.
3. Impact assessment and mitigation planning, in which the proposed action is evaluated to determine the impact on the resources identified in the inventory. Appropriate mitigation measures are identified where it is possible to make adjustments in the proposed action that reduce or eliminate impacts.
4. Participating in agency reviews of the EA and responding to questions and comments.
5. Preparing an EA, including decision documents.

When the NEPA process is successfully concluded with an EA, other environmental permitting actions may follow, such as preparation of a prevention of significant deterioration (PSD) permit under the Clean Air Act. If a FONSI cannot be obtained, an EIS is required.

#### **B. Environmental Impact Statements**

EISs are prepared to meet the requirements of the NEPA whenever an EA does not result in a FONSI. The objective of an EIS is to evaluate any major federal action that is proposed that has the potential for significant environmental impact and to provide a forum for a public decision making process regarding the action. An EIS can include the following elements of work.

- EIS scoping in which the general technical approach is agreed upon and the public involvement program is initiated. Potential sources of data are identified and the scope of the proposed action, as well as any known alternatives, is reviewed.
- Inventorying natural, human, and cultural resources based on existing sources of information. Typical elements of the resource inventory include geology, hydrology, vegetation, wildlife, threatened and endangered species, air quality, land use (existing and planned), visual characteristics, socioeconomic character, and acoustic conditions. Cultural resources include archaeological sites, historical sites, sites with religious or social significance, and other sites with cultural significance.
- Impact assessment and mitigation planning, in which the proposed action is evaluated to determine the impact on the resources identified in the inventory. Appropriate mitigation measures are identified where it is possible to make adjustments in the proposed action that reduce or eliminate impacts. Alternatives to the proposed action, including “no action,” are considered to evaluate the impact on the environment. The impact of the proposed action is compared to the impact of the other alternatives.
- Preparing a draft EIS and distributing that report to all interested parties including elected officials, citizen groups, and the public.
- Participating in agency reviews and public hearings regarding the draft EIS and responding to questions and comments.
- Preparing a final EIS including all comments and the responses to those comments.
- Preparing decision documents required for a record of decision (ROD).

When the NEPA process is successfully concluded with an EIS, other environmental actions may follow, such as permit preparation.

#### **4. STUDY PHASE ACTIVITIES**

Preliminary phase activities consist of studies and investigations. These studies and investigations must be conducted to gather the information that is necessary for the design phase.

##### **A. Pre-Title I Activities**