

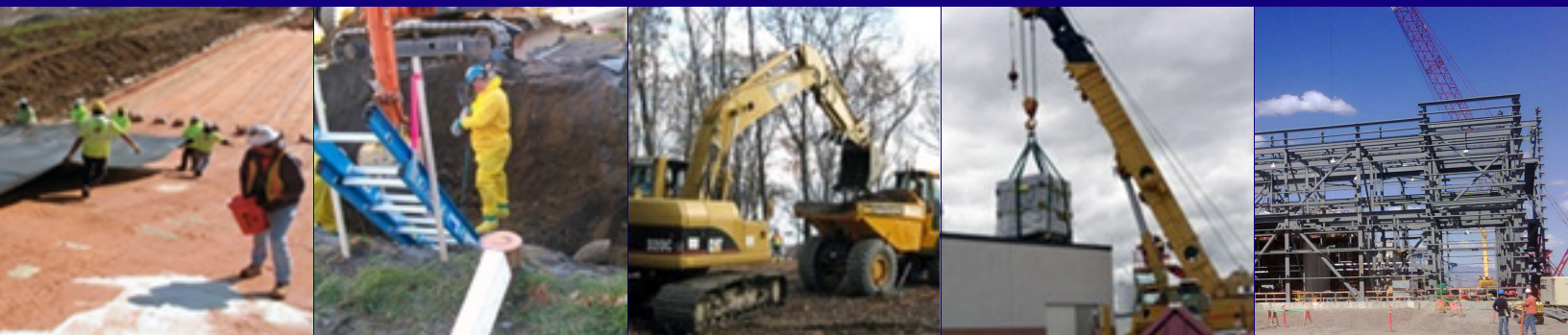


DOE - EM - SRP - 2010
2nd Edition

Environmental Management
Safety ▪ Performance ▪ Cleanup ▪ Closure

STANDARD REVIEW PLAN (SRP)

DECOMMISSIONING PLAN REVIEW MODULE



**CORPORATE CRITICAL DECISION (CD) REVIEW AND
APPROVAL FRAMEWORK ASSOCIATED WITH NUCLEAR FACILITY CAPITAL AND
MAJOR CONSTRUCTION PROJECTS**

MARCH 2010

OFFICE OF ENVIRONMENTAL MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON D. C. 20585

OFFICE OF ENVIRONMENTAL MANAGEMENT

Standard Review Plan (SRP)

Decommissioning Plan

Review Module

Critical Decision (CD) Applicability					
CD-0	CD-1	CD-2	CD-3	CD-4	Post Operation
					✓



March 2010

FOREWORD

The Standard Review Plan (SRP)¹ provides a consistent, predictable corporate review framework to ensure that issues and risks that could challenge the success of Office of Environmental Management (EM) projects are identified early and addressed proactively. The internal EM project review process encompasses key milestones established by DOE O 413.3A, Change 1, *Program and Project Management for the Acquisition of Capital Assets*, DOE-STD-1189-2008, *Integration of Safety into the Design Process*, and EM's internal business management practices.

The SRP follows the Critical Decision (CD) process and consists of a series of Review Modules that address key functional areas of project management, engineering and design, safety, environment, security, and quality assurance, grouped by each specific CD phase.

This Review Module provides the starting point for a set of corporate Performance Expectations and Criteria. Review teams are expected to build on these and develop additional project-specific Lines of Inquiry, as needed. The criteria and the review process are intended to be used on an ongoing basis during the appropriate CD phase to ensure that issues are identified and resolved.

¹ The entire EM SRP and individual Review Modules can be accessed on EM website at <http://www.em.doe.gov/Pages/Safety.aspx>, or on EM's internet Portal at <https://edoe.doe.gov/portal/server.pt> Please see under /Programmatic Folder/Project Management Subfolder.

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ACRONYMS

ALARA	As Low As Reasonably Achievable
CD	Critical Decision
CDR	Conceptual Design Report
DOE	Department of Energy
DPR	Decommissioning Plan Review
DSA	Documented Safety Analysis
D&D	Deactivation & Decommissioning
EIR	External Independent Review
EM	Office of Environmental Management
ES&H	Environment, Safety, and Health
FPD	Federal Project Director
FRAM	Functions, Responsibilities, and Authorities
IPR	Independent Project Review
LTS	Long-Term Stewardship
PEP	Project Execution Plan
SRP	Standard Review Plan
WBS	Work Breakdown Systems

I. INTRODUCTION

As stated in Department of Energy (DOE) Order 413.3A, Program and Project Management for the Acquisition of Capital Assets:

Following approval of CD-0, Approval of Mission Need, the project team will commence development of the alternative strategies that will satisfy the Mission Requirements identified in the Program Requirements Document. These alternative strategies will culminate in the proposed path forward for the project, the Conceptual Design.

DOE O 413.3A, Table 2, identifies the key deliverables associated with CD-1. Two of these are the Conceptual Design Report (CDR) and the Project Execution Plan (PEP). Specifically O 413.3A Table 2 states:

Prepare a Conceptual Design Report which is an integrated systems engineering effort that results in a clear and concise definition of the project.

Prepare a Preliminary Project Execution Plan, including a Risk Management Plan and Risk Assessment that establishes the initial policy and procedures to be followed to manage and control project execution.

DOE O 413.3A, while developed primarily to address design and build projects, is applicable to Deactivation and Decommissioning (D&D) projects as well. D&D projects also fall under the requirements of DOE O 430.1B, *Real Property Asset Management*. Therefore, it is necessary for a decommissioning project to address the requirements of both of these referenced DOE orders and the associated guidance documents. DOE O 430.1B, Attachment 2, *Contract Requirements Document*, section 6.c requires the contractor to:

Develop a disposition plan that identifies, assesses, and evaluates alternatives and integrates environmental, safety, and health requirements into disposition activities. The disposition plan should be tailored based on the disposition baseline and disposal method to be used (e.g., reuse, demolition, or decommissioning).

While the terminology used in the two orders is not the same, it is clear that both orders require the development of a project plan for decommissioning projects. For the purpose of this review module the document is called the decommissioning plan and is the equivalent of the conceptual design report/project execution plan for a traditional design and build project. The use of the term decommissioning plan is supported by DOE-STD-1120-2005, *Integration of Environment, Safety, and Health into Facility Disposition Activities*, Volume 1, Section 2.2 which discusses decommissioning plans.

II. PURPOSE

The Decommissioning Plan Review (DPR) Module is a tool that assists DOE federal project review teams in evaluating the adequacy of the decommissioning plan prior to approval of the associated CD. The DPR Module focuses on the decommissioning plan key elements as defined

in DOE Orders and guidance including characterization planning, alternatives analysis, end-state identification and end-point criteria development, systems engineering and value management, risk analysis/technical challenges, and integration of safety. This module has been developed to ensure that the decommissioning planning process has effectively integrated the key elements identified above to evolve a cost-effective, preferred solution to meet a mission need (DOE O 413.3A). Upon completion of the DPR the team will have sufficient evidence to support the FPD in their decision regarding approval of CD.

III. ROLES AND RESPONSIBILITIES

A successful DPR depends on an experienced and qualified team. The team should be augmented with appropriate subject matter experts selected to complement the specific technical concerns of the project being reviewed. The specific types of expertise needed will be dependent on the type of facility being reviewed, as well as other factors such as complexity and hazards or risks.

It is preferred that personnel selected to participate in a decommissioning planning review have decommissioning experience. It is strongly recommended that the team leader should either be a project or systems engineer experienced in the management of a multi-disciplined review team (e.g. mechanical, electrical chemical, industrial, nuclear) that matches to the extent practicable the contractors decommissioning team. The review team should be augmented with subject matter experts as appropriate to review specialty matters such as nuclear criticality safety.

Management support is another necessary component to a successful DPR. Field element managers, as well as the Federal Project Director, must recognize the importance of the DPR and facilitate the resources necessary for its execution. This also requires appropriate interfaces with Office of Environmental Management (EM) headquarters personnel who may direct or participate in the DPR process.

The roles and responsibilities for all involved in the DPR must be clear and consistent with various requirements of DOE O 413.3A and the DOE Functions, Responsibilities, and Authorities (FRAM). The table below provides a compilation of design review roles and responsibilities.

Entity	Roles and Responsibilities
Field Element Manager	Provides support and resources to the Federal Project Director and Review Team Leader in carrying out the design review.
	Facilitates the conduct of the review. Assigns office space, computer equipment, and support personnel to the team as necessary to accomplish the review in the scheduled time frame
Federal Project Director	Identifies the need for a decommissioning plan review and determines the scope of the review effort.
	In conjunction with the Contractor Project Manager, develops the briefing materials and schedule for the review activities.
	Coordinates the review team pre-visit activities and follows up review team requests for personnel to interview or material to review.
	Coordinates the necessary training and orientation activities to enable the

Entity	Roles and Responsibilities
	<p>review team members to access the facility and perform the review.</p> <p>Unless other personnel are assigned, acts as the site liaison with the review team. Tracks the status of requests for additional information.</p> <p>Coordinates the Federal site staff factual accuracy review of the draft report.</p> <p>Leads the development of the corrective action plan if required. Tracks the completion of corrective actions resulting from the review.</p>
Review Team Leader	<p>In coordination with the Federal Project Director and the Acquisition Executive, selects the areas to be reviewed.</p> <p>Based on the areas selected for review, project complexity and hazards involved, selects the members of the review team.</p> <p>Verifies the qualifications: technical knowledge; process knowledge; facility specific information; and independence of the Team Members.</p> <p>Leads the review pre-visit.</p> <p>Leads the review team in completing the Review Criteria for the various areas to be reviewed.</p> <p>Coordinates the development of the data call and forwards to the Federal Project Director, a list of documents, briefings, interviews, and presentations needed to support the review.</p> <p>Forwards the final review plan to the Acquisition Executive for approval.</p> <p>Leads the on-site portion of the review.</p> <p>Ensures the review team members complete and document their portions of the review and characterizes the findings.</p> <p>Coordinates incorporation of factual accuracy comments by Federal and Contractor personnel on the draft report.</p> <p>Forwards the final review report to the Federal Project Director for consideration in making the decision to authorize approval of the CD. This review should be consistent with the DOE O 413.3A critical decision process and the other applicable guidance on the review of EM projects.</p> <p>Participates, as necessary in the closure verification of the findings from the review report.</p>
Review Team Member	<p>Refines and finalizes the criteria for assigned area of the review.</p> <p>Develops and provides the data call of documents, briefings, interviews, and presentations needed for his or her area of the review.</p> <p>Completes training and orientation activities necessary for the review. Conducts any necessary pre visit document review.</p> <p>Participates in the on-site review activities, conducts interviews, document reviews, walk downs, and observations as necessary.</p> <p>Based on the criteria and review approaches in the Review Plan, assesses whether his/her assigned criteria have been met.</p> <p>Documents the results of the review for his or her areas. Prepares input to the review report.</p> <p>Makes recommendations to the Review Team Leader for characterization of findings in his or her area of review.</p> <p>Resolves applicable Federal and Contractor factual accuracy comments on the draft review report.</p> <p>Prepares the final review report for his or her area of review.</p>

IV. REVIEW SCOPE AND CRITERIA

This DPR Module provides a set of review criteria that are organized based on the key technical/safety areas and disciplines identified in the DOE Orders and guidance. These review areas are summarized below and include characterization planning, alternatives analysis, end-state identification and end-point criteria development, systems engineering and value management, risk management/technical challenges, and integration of safety, long term stewardship, performance measurement, and waste management. For each review area, Appendix A of this Module provides overall performance objectives and then a subset of review criteria that satisfy each performance objective. These performance objectives and review criteria will provide consistent guidance to project-specific design review teams to develop their Lines of Inquiry.

Characterization Planning

One of the most significant challenges in preparing for D&D is the adequate characterization of the facility to ensure most appropriate methodologies and technologies and the safe execution of D&D activities. This area is focused on ensuring that the decommissioning plan adequately addresses characterization needed to support facility decommissioning activities.

Alternatives Analysis

This review area ensures that the decommissioning planning process and documentation adequately analyzed the appropriate alternatives before ultimately deciding upon the preferred alternative. Each of the alternatives considered must be rigorously evaluated to ensure that the conceptual design process is adequately executed and that the preferred alternative (end-state) is the best available alternative to meet the mission needs and long-term stewardship requirements/goals. At this stage of D&D project planning “alternatives,” refer not to whether or not to do D&D, but rather to the alternative potential end states and the alternative specific methods to achieve the selected end state.

End-State Identification

This area is focused on ensuring that the decommissioning plan identifies the preferred end-state for the facility and that the end-state has appropriate approval of the applicable regulatory organizations. This area also addresses the adequacy of end-points developed to support the identified end-state.

Systems Engineering & Value Management

This review area is focused on the evaluation of the systems engineering and value management process as applied to the development of the decommissioning plan. The implementation of systems engineering and value management processes are an essential element to the ultimate success of a D&D project.

Risk Management

The purpose of this review area is to ensure that the project risks associated with the alternatives including the preferred alternative are systematically identified, and managed using a documented and adequate process. Risk identification and management is essential to the overall success of the project, and the risks associated with all of the considered alternatives need to be considered as part of the determination of the preferred alternative. Risk management is also integrally tied to the identification of “adequate” characterization with the analysis leading to decisions regarding the balance between known and unknown characterization information and the acceptance and/or integration of the identified risks.

Integration of Safety

The purpose of this review area is to ensure that the decommissioning plan has adequately integrated safety in the selection of decommissioning alternatives and processes. This review area also addresses the requirement for the completion a preliminary hazards analysis for the preferred alternative and the associated identification of safety class, safety significant and important to safety systems, structures and components for decommissioning activities. These documents provide the basis for development of the documented safety analysis and are key in defining the Authorization Basis or Safety Basis.

Long-Term Stewardship

This review area is designed to ensure that the decommissioning plan has adequately identified the needed elements for long-term stewardship based on the selected alternative (end-state).

Performance Measurement

This review area is designed to ensure that the decommissioning plan identifies appropriate performance measurement methods, processes and milestones so that project management and DOE can evaluate the progress of the project.

Waste Management

This review area addresses waste management issues for the decommissioning plan. In a decommissioning project the disposition of waste can be a significant portion of the project costs and both the cost and logistics of waste management must be adequately addressed in the decommissioning plan.

Decommissioning Plan Development

This review area is designed to ensure that the overall decommissioning plan addresses the appropriate functions, purposes and contents to help facilitate the decommissioning project activities.

V. REVIEW PLANS AND DOCUMENTATION

The results of a DPR will be used by the DOE Federal Project Director and ultimately the Acquisition Executive to help determine whether project funds may be authorized by approval of approval of the associated CD. It is important to clearly document the methods, assumptions and results of the DPR.

The following activities should be conducted as part of the Review Plan development and documentation/closure of the review:

- Subsequent to the selection, formation and chartering of the review team and receipt and review of the prerequisite documents, assignment of responsibilities for the development of specific lines of inquiry should be made.
- The review team members should develop specific lines of inquiry utilizing the topics and areas listed in the respective appendices of this module.
- The individual lines of inquiry should be compiled and submitted to the manager authorizing the review for concurrence prior to starting the review.
- The project-specific review plan should be compiled with a consistent and uniform numbering scheme that provide for a unique identifier for each line of inquiry, arranged by subject area (e.g. Management-Personnel and Qualifications, Management-Processes and Systems, Technical-Civil, etc.) such that the results of each line of inquiry can be documented and tracked to closure.
- The lines of inquiry should be satisfied via document review and personnel interviews and any combination of these methods. The method used for the basis of closure/comment/finding and the result of the inquiry should all be documented and tracked.

The report produced from the review should follow the format (but in abbreviated form) of an External Independent Review (EIR) or Independent Project Review (IPR) report with the focus on a composite listing of the lines of inquiry and the results of each.

VI. REFERENCE MATERIAL

- DOE Order DOE O 413.3A, Program and Project Management for the Acquisition of Capital Assets
- DOE Order DOE O 430.1B, Real Property Asset Management
- DOE Guide DOE G 430.1-4, Decommissioning Implementation Guide
- DOE Guide DOE G 413.3-8, Environmental Management (EM) Cleanup Projects
- DOE-STD-1120-2005, Integration of Environment, Safety and Health into Facility Disposition Activities

- DOE/EM-0383, *Decommissioning Handbook*, January 2000
- Decommissioning Program Plan, Rocky Flats Environmental Technology Site, Rev 1, June 21, 1999 Tailoring Deactivation & Decommissioning Engineering/Design Activities into the Requirements of DOE Order 413.3A, Office of Engineering and Technology, EM-20, April 2, 2008

APPENDIX A – PERFORMANCE OBJECTIVES AND CRITERIA

Legend of Safety and Engineering Review Topics

Review Topical Area	Identifier
Characterization Planning	CP
Alternatives Analysis	AA
End-State Identification	ES
Systems Engineering & Value Management	SE
Risk Analysis	RA
Integration of Safety	IS
Long-Term Stewardship	LTS
Performance Measurement	PM
Waste Management	WM
Decommissioning Plan Development	DP

ID #	Performance Objectives and Criteria ²	Met?
Characterization Planning		
CP-1	Does the decommissioning plan include appropriate provisions for facility characterization? (evaluate the following as applicable)	
	Have relevant documents (including DSAs, HASPs, EISs, EAs, permits, waste management plans, waste analysis plans, contingency plans, design documents, operational records, unusual occurrences, etc.) been reviewed and the appropriate information regarding the facility and hazards been collected? (CP-1.1)	
	Have current and past facility employees been interviewed as appropriate to gather information not evident from document reviews? (CP-1.2)	
	Have facility walk downs been performed using a multidiscipline team to assess and confirm existing facility conditions and inherent hazards? (CP-1.3)	
	Has a determination been made and presented in the decommissioning plan, on the need for additional characterization based on the level of uncertainty regarding knowledge of hazards and data quality objectives? (CP-1.4)	
	Does the decommissioning plan include intrusive characterization activities as appropriate to develop a thorough understanding of the facility conditions and hazards? (CP-1.5)	
	Has the risk analysis correctly identified and quantified the risk associated with insufficient characterization and applied appropriate contingencies?: (CP-1.6)	
Alternatives Analysis		
AA-1	Have alternatives analysis been performed in support of the decommissioning plan such that they meet the requirements and guidance of the DOE orders, standards, and manuals?	

² The site should provide the technical bases and assumptions that support the answers provided to each Line of Inquiry. If possible, the review teams should independently verify the technical bases and assumptions.

ID #	Performance Objectives and Criteria ²	Met?
	Has alternatives analysis been performed based on appropriate, applicable and feasible technologies? (AA-1.1)	
	Have alternatives analysis considered life-cycle costs, including decommissioning activities, surveillance & maintenance and disposal? (AA-1.2)	
	Have alternative analysis considered (at this point since D&D has been identified the evaluation of these alternatives will be focused on methods for D&D and End-States) : <ul style="list-style-type: none"> • stakeholder values, • reliability, • operability • maintainability • safety • technology development requirements • project risks, and • regulatory requirements? (AA-1.3) 	
	Was the recommended alternative selected based on a systematic analysis of the benefits and costs? (AA-1.4)	
AA-2	Is the preferred alternative documented in accordance with relevant industry standards and has stakeholder involvement/approval as appropriate?	
AA-3	Does the decommissioning plan present a project baseline including cost and schedule for the preferred alternative?	
	Is the baseline derived from activity-based schedules and estimates to the degree possible? (AA-3.1)	
	Does the baseline adequately address the costs of packaging, shipping and disposing of waste for the project? (AA-3.2)	
	Are the baseline costs developed using defensible criteria including walk downs and parametric estimates as appropriate? (AA-3.3)	
End-State Identification		
ES-1	Does the decommissioning plan identify the end-state (preferred alternative) and the specific end-point criteria?	
	Do the end-points identified in the decommissioning plan provide a facility disposition that is in accordance with the end-state identified in the decommissioning plan? (ES-1.1)	
	Have the appropriate regulators approved the end-state as identified in the decommissioning plan? (ES-1.2)	
ES-2	Does the decommissioning plan identify the activities necessary to achieve the identified end-points?	
ES-3	Are the end-points identified in the decommissioning plan are technically feasible?	
ES-4	Are the end-points identified in the decommissioning plan are detailed specifications of conditions to be achieved for all of the facility's spaces, systems, and major equipment?	
ES-5	Does the decommissioning plan project baseline is based on the identified end-points and the necessary activities to achieve the end-points?	

ID #	Performance Objectives and Criteria ²	Met?
Systems Engineering & Value Management		
SE-1	Was the system engineering process adequately performed in selecting and developing the preferred alternative?	
	Did the systems engineering process consider the alternative studies, the need for characterization and technology development? (SE-1.1)	
SE-2	Was the system engineering process adequately performed in developing project baseline and the Work Breakdown Systems (WBS) for the decommissioning project (execution of the preferred alternative)?	
Risk Analysis		
RA-1	Was a formal risk analysis/management process used to identify the project risks associated with all of the alternatives evaluated in the alternatives analysis?	
	Did the risk management process involve all of the IPT and external experts as appropriate? (RA-1.1)	
	Are risks for each alternative clearly identified and their consideration is evident in the selection of the preferred alternative? (RA-1.2)	
Integration of Safety		
IS-1	Does the decommissioning plan demonstrate how environment, safety and health requirements are integrated into disposition activities as required by DOE O 431.1B?	
IS-2	Does the decommissioning plan convey the set of Environment, Safety, and Health (ES&H) requirements that are applicable to the decommissioning project?	
IS-3	Does the decommissioning plan conveys the tailored set of ES&H requirements that are applicable at the project level based on the anticipated hazards and work scope?	
IS-4	Has a preliminary hazard analysis has performed for the preferred alternative and documents the hazards and appropriate controls in accordance with DOE Orders and guidance?	
Long-Term Stewardship		
LTS-1	Does the decommissioning plan include provisions for LTS in accordance with the requirements of DOE O 430.1B as applicable?	
	Have stakeholders been involved in the development of LTS plans? (LTS-1.1)	
	Does the decommissioning plan include a post-closure/post-disposition/LTS records turnover or retention plan? (LTS-1.2)	
	Does the decommissioning plan includes S&M plans for facilities and land parcels with residual contamination, hazards, or other conditions that are projected to require post-disposition LTS and do the included S&M plans address the elements required by DOE O 430.1B Attachment 2, section 6.c.(4)? (LTS-1.3)	
	Does the decommissioning plan include a process to track the status of LTS actions, including gap analysis of the LTS transition framework to identify actions remaining before end-point conditions are satisfied? (LTS-1.4)	

ID #	Performance Objectives and Criteria ²	Met?
	Does the decommissioning plan include cost and schedule information for disposition activities and any follow on S&M and LTS requirements? (LTS-1.5)	
Performance Measurement		
PM-1	Does the decommissioning plan include appropriate performance measurement processes and criteria?	
	Does the decommissioning plan include a process to track performance based on the completion and status of in-process end-points? (PM-1.1)	
	Does the decommissioning plan include a work set based approach for building cleanout performance metrics as appropriate? (PM-1.2)	
	Does the decommissioning plan include quantitative performance metrics as appropriate for the project? (PM-1.3)	
Waste Management		
WM-1	Does the decommissioning plan include adequate planning and evaluation for waste management during the disposition project?	
	<p>Does the decommissioning plan include all of the following waste planning elements as appropriate:</p> <ul style="list-style-type: none"> • Waste types and quantity estimates • Constraints • Processing required for removal • Processing and characterization for packaging; packaging by waste type • Transportation mode by waste type • Disposal destinations • Organization • Waste related trade studies • Verifications required • Uncertainties • Project risks? (WM-1.1) 	
	Does the decommissioning plan Work Breakdown System (WBS) include the appropriate level of detail for waste planning in accordance with the expectations of DOE G 413.3-8, section 3.2.5.2? (WM-1.2)	
Decommissioning Plan Development		
DP-1	Are the decommissioning functions, purposes and contents addressed by the Decommissioning Plan?	
	Does it describe the measures to be taken to comply with environmental regulations and safety and health requirements for the protection of workers, public and environment? (DP-1.1)	
	Does the Decommissioning Plan define a sequence of decommissioning tasks and the scope of work at each task? (DP-1.2)	
	Are the Decommissioning Plan and the Documented Safety Analysis consistent, so any changes to work plans as defined in the Decommissioning Plan may be considered for potential impacts to the DSA? (DP-1.3)	

ID #	Performance Objectives and Criteria ²	Met?
	Does it define the scope of the project, setting technical, cost, and schedule baselines and describe how the project will be managed? (DP-1.4)	
	Does it describe Final Site Survey, including plans and criteria, and independent verification? (DP-1.5)	
	Does it referenced and/or described key supporting documents, including the following? (DP-1.6) <ul style="list-style-type: none"> • Documented Safety Analysis • Health and Safety Plan • As Low As Reasonably Achievable (ALARA) Plan • Mitigation Action Plan • Risk Assessment • Waste Management Plan • Engineering studies to support technical decision • Details of Work Breakdown Structure • Details of cost estimate, including the basis of estimate • Details of schedule • Training • Quality assurance • Emergency preparedness and response program 	
	Has the planning been tailored to identify those engineering and design achievements that should be completed in sufficient detail to support a reliable scope, cost and schedule baseline? (DP-1.7)	