Annex W

Implementation Schedule

Figure W1 Drawdown Implementation Schedule

Annex W: Implementation Schedule

W.1 General

The schedule information presented in this annex was based on the scope of work, assumptions, and methodology presented in the companion engineering annexes (Annexes A through V of this appendix). The following sections summarize the overall project implementation schedule and provide specific details concerning the schedule of the proposed work items.

The general process for implementing the work is to perform a three-step process consisting of 1) preparation of a detailed design report, 2) preparation of contract documents, and 3) performance of construction.

The detailed design report, formerly designated a General Design Memorandum or a Feature Design Memorandum, details the process of identifying, evaluating, and selecting a design option. The activities often are precluded by a survey of each construction site to establish the land configuration. Subsurface explorations using intrusive methods such as drilling, excavating, and sampling and/or geophysical methods such a pulse-velocity, radar, or other subsurface logging methods are conducted at this stage. For some features, hydraulic models must be constructed and flow conditions evaluated for a range of flow and physical conditions. Options are developed for the feature and detailed evaluations are made to select the most favorable option. The selected option is often further developed so that a reliable schedule and cost estimate may be generated.

After review and approval of the detailed design report, preparation of the plans and specifications can proceed. This phase requires completion of the feature design and the development of contract documents. The documents must be prepared in a manner that allows bidders to prepare a realistic bid proposal, that presents features in manner that is constructable, and that provides implementation and operations that address the relevant environmental concerns.

Once a contract has been awarded, the construction can begin. The short-term nature of many of the tasks coupled with the complexity of implementation will require the participation of many individuals and organizations. Construction activity spans a time period of approximately 8 to 9 years. During the peak years, expenditures are estimated at 200 million in a single year. The bulk of the work is done during a 3-month period. Extensive contractor participation is necessary for this level of effort. Significant administration and construction management participation is also required.

The schedules below reflect reasonable time durations to perform these efforts. They identify time for producing detailed design reports, contract documents, peer and policy reviews, advertising periods and construction operations.

W.2 Overall Implementation Schedule

The implementation of drawdown can be grouped into 3 distinct phases. The preparatory phase is the work necessary to be done in advance of drawdown in order to be able to perform drawdown and to continue operations during drawdown. The drawdown phase is the work required during and immediately following drawdown of the reservoirs. Numerous tasks are anticipated to be performed following drawdown. The period of time that all these occur is shown in Figure W1.

A key decision in implementing drawdown is the sequence of dam breaching. Many options are conceivable. They range from concurrent breaching of all 4 dams in a single construction season to individual breaching of each dam during different seasons with many combinations between.

Breaching individual dams on different years greatly simplifies construction operations and focuses attention on one project at a time. The first project provides a troubleshooting opportunity so that subsequent projects can be breached more effectively. Events that may lead to delays that prevent breaching during the designated season are more effectively controlled increasing the likelihood of on-schedule completion. Funding is less difficult to secure because annual requirements can be spread out over a longer period of time.

Breaching of an embankment structure will generate the migration of embankment silts and sands down river. A much more significant effect is the migration of silt deposits and higher velocity river flows erode those deposits. Silts suspended in the water may be at very high concentrations during the drawdown period of August to December and possibly higher levels during the high flow months of January through June. The effect of this silt and sediment is expected to have a serious negative effect on adult fish migration and a lesser effect on juvenile migration.

If the four dams are breached simultaneously, then this condition will be concentrated to the shortest time period thereby minimizing the negative effects on migrating fish. Biologists expect that expanding this situation as long a four consecutive years could be detrimental to the species (Jones, 1999). Breaching the four dams over two consecutive years provides for realistic implementation of all the construction activity for a time period less devastating than other options that include longer periods.

An aggressive schedule to simultaneously breach four dams needs much more detailed evaluation. An evaluation of risks and impacts of specific construction activities is necessary to produce a plan that contains the appropriate backup plans and contingencies to guarantee that the work can be completed in the short timeframe. At the current level of study, it is clear that too many things can go wrong that may force the project into a 2-year breach schedule. Until those uncertainties can be resolved, a 1-year breach schedule cannot be considered.

There is appropriate equipment available to accomplish simultaneous removal of all four dams using one or more contractors. The fewer contractors used, the less the overall cost would be. Each additional contractor used would add approximately 10 percent to the total cost of the individual dam's work. There are three scenarios for removal of the embankments at the four lower Snake River dams:

- Remove one embankment each year.
- Remove one or two embankments the first year, gaining experience from that operation, then remove the remaining two or three embankments the following year.
- Remove all four dams concurrently in one year.

There are significant advantages to removing all four embankment dams in one year. This option would return the river to its natural state for fish migration much sooner. It would also shorten construction duration because reservoirs could be drawn down and some of the work could be accomplished in the dry. The headwater of one dam would be the tailwater of the next dam upstream, and if that reservoir had been drawn down, then construction at the upstream dam could more easily be accomplished either in the dry, or in a lower, quieter flow condition.

The schedule shown in this annex presents the scheme where Lower Granite and Little Goose are removed in the first removal season and Lower Monumental and Ice Harbor are removed in the second removal season. Further consideration of impacts to fish migration, sedimentation, and specific site conditions may encourage removal to be done in reverse order. We do not have sufficient information at this time to determine which order is clearly preferred.

W.3 Schedules for Individual Tasks

The following discussion provides explanation of some of the assumptions that support the schedules for the individual tasks.

W.3.1 Turbine Passage Modification

The design of required elements of turbine modifications may result in 2 to 8 contracts. It is very likely that all the intake gate modifications will be designed and contracted as a group. Likewise work for tailrace draft tube bulkheads, cooling water modifications, and instrumentation systems will be packaged into separate design and construction packages. Groups refer to all the items to be done at one time, e.g., Little Goose and Lower Granite intake gates in one contract.

Sufficient lead time is necessary to order specific parts. Precast construction of tailrace bulkheads requires significant lead time. Most of the work can be completed at any time in advance of drawdown. Target deadlines have been assume to be 60 days in advance of the start of drawdown for the respective project.

The critical element in this feature is the removal of the turbine blades for three units at each project. Very early removal of the blades results is a longer period of lost power production. More importantly, turbines must remain operational through the previous spill season in order to minimize spillway usage and limit the consequent gas levels in the river. For this reason some further development of blade removal activity should be considered.

W.3.2 Dam Embankment Excavation and River Channelization

It is anticipated that the contract for breaching and removing the embankment dam will be for both dams scheduled for that season. This work involves developing stockpile or waste areas, haul roads, excavation, bank protection, and restoration of the site. The contract will also include construction of the channelization levees, installation of the permanent fish passage features, and certain elements of the decommissioning of the remaining powerplant, spillway, navigation lock, and appurtenant facilities.

Contract award should provide up to 6 months of lead time contract work in advance of drawdown. It is critical that the breach and embankment removal be completed in advance of 31 December. River channel efforts can be more easily accommodate short periods of high flows during the months of January and February.

The study team believed construction excavation rates could exceed the values assumed for this schedule. However, even with the excavation rates assumed, the drawdown rate of 0.6 meter (2 feet) per day governs the length of construction. Beginning drawdown several weeks before the start of excavation and allowing faster excavation rates would shorten the length of time the embankment is exposed to overtopping during construction, but would not reduce the overall length of the in-water construction period, which is governed by the drawdown rate.

W.3.3 Temporary Fish Passage

The major tasks in this feature are modification of the existing fish ladder to incorporate a fish trap and loading facility, the modification of existing fish transport trailers, and the fabrication of new fish transport trailers.

Significant lead time is necessary to fabricate and modify fish transport trailers. Existing trailers must be used to transport juveniles downstream during the spring-early summer migration period. Consequently modifications must allow trailers the ability to switch between juvenile and adult haul mode without major effort. Adult hauling will commence almost immediately following juvenile hauling.

W.3.4 Bridge Pier Protection

Protection measures for bridge piers include the transportation of riprap for bank protection, the installation of sheetpile to encapsulate bridge piers, and the placement of rock and concrete inside the sheetpile enclosures. The in-water work is configured to be done during the in-water work window, although some provision for early extensions is necessary.

Two sets of floating plant are required to perform all the bridge pier and abutment modifications in the Lower Granite and Little Goose Reservoirs. A single set of floating plant is required the following season to complete the bridge modifications in the Lower Monumental pool. No modifications are necessary in the Ice Harbor pool.

Following drawdown, final trimming of sheetpile and backfill with concrete can be done during low water periods. Some in-water work, consisting of diving and steel cutting is necessary during the late summer and fall time period. Concrete backfill will be placed within the cells via a concrete pump from the bridge deck or from the river bank.

W.3.5 Railroad and Highway Embankment Protection

Production of adequate quantities of rock, transportation of the rock, and placement of riprap for embankment protection and stabilization of drainage structures is one of the critical path elements in this implementation scheme. Two new quarries must be located and evaluated for suitable rock. Rock must be crushed into the proper sizes and barge transported to pre-determined underwater stockpile locations. This work must be completed for the respective reservoirs prior to drawdown of those reservoirs. Access to the work sites after drawdown may be a difficult and time consuming process. Access over previously inundated rail and road beds may require significant measures to make viable. There is little latitude for adding contingency time during the barge transportation phase without extending the drawdowns one season later. Contingency time for placement of riprap will extend the placement season accordingly.

W.3.6 Drainage Structures Protection

For each reservoir, durations were determined and timeframes considered for all major functions necessary to load, transport, and place riprap materials for drainage structure modifications. Quantities derived for all treatments in each reservoir were added to the schedules. Durations for completion of the construction activities were then calculated based on selected productivity rates and numbers of crews to perform the tasks. Since this work will be done concurrently with reservoir embankment protection activities, appropriate work items have been included in the reservoir embankment protection schedules.

W.3.7 Railroad and Roadway Damage Repair

No schedule is provided for this task since it will depend on the nature and location of damage. Contract arrangement to perform the required repairs will be pre-negotiated so that contract forces can be mobilized to initiate repairs at the earliest possible time.

W.3.8 Lyons Ferry Hatchery Modification

The work required to modify Lyon's Ferry Hatchery will be done in two phases. The critical element is to modify the water supply pipeline prior to drawdown. The most expeditious method is to make modifications to the pipe pile system from a floating plant. Much of this pipeline is in the delta zone of the Palouse River. Access is difficult but not impossible. The installation of new pipe pile bents to stabilize the pipeline will require 6 months of in-water work.

The second critical element is to perform the necessary well modifications to restore the required hatchery water as soon as possible after drawdown. Wells will be modified or additional wells drilled to provide water lost by a drop in water surface. Pumps cannot be ordered until the wells are established and pump characteristics established. Up to 9 months lead time is required for pumps to be fabricated for this application.

During and immediately following the drawdown period temporary drain and overland flow piping is required until permanent structures can be constructed. Construction of those structures will be done during the late summer months after sufficient drainage of the bank deposits has occurred.

W.3.9 Habitat Management Units Modification

Habitat management unit modifications consist of revising and relocating irrigation system water intakes and installation of wildlife fencing. New intakes cannot be installed until after drawdown when the river location during low water conditions can be determined for each site. Intake structures will be prefabricated concrete units that can be placed on a prepared surface. The intake is mounted on the vertical face and the pump is mounted on the top of the unit. Fill material is placed out to the intake structure.

Temporary watering facilities are necessary for the summer and fall season following drawdown until the permanent intakes can be constructed. Temporary pumps mounted on trailers are one means to provide this interim water supply.

W.3.10 Reservoir Revegetation

Revegetation of exposed ground will commence within a few weeks after the start of drawdown of each reservoir. The schedule assumes an aerial application of seed and fertilizer on the exposed land mass for each reservoir on a 2 to 3 week interval.

W.3.11 Cattle Watering Facilities

Cattle watering facilities consist of a low capacity drilled well, a solar powered pump, and a ground level stock tank. Since the wells cannot be drilled until after drawdown, temporary watering facilities must be provided and maintained until the permanent system is complete. Temporary watering will be truck-hauled water to each watering site. Because access to some sites is difficult, installation of the temporary and permanent systems is estimated to take a long period of time.

W.3.12 Recreation Access Modification

Modifications to recreation areas are separated into two phases. Prior to drawdown, the critical feature is to establish an irrigation system for the areas to remain in operation. A combination of temporary and permanent systems have been scheduled. Other modifications such as demolition of facilities, relocation of boat ramps, and construction of other facilities is scheduled to be completed following drawdown.

W.3.13 Cultural Resources Protection

Protection of cultural resources sites cannot proceed until the sites are exposed by drawdown. The construction schedules show that the work will commence immediately following drawdown and continue for a period of one year following drawdown.

W.3.14 Hydropower Facilities Decommissioning

The major activities include disposal of value items, disposal of hazardous wastes, and securing each project site. Site security facilities will be constructed as part of the site construction work. Concurrent work in securing the facilities to be abandoned will be done concurrently. Disposal of items of value can commence as early as January, immediately following drawdown. This work may require many months to complete. Identified hazardous wastes will be collected and disposed of concurrently with removal of items of value.

W.3.15 Non-Federal Implementation Tasks

Schedules were not developed for the following tasks. Those tasks were developed in order to provide a "ballpark" estimate of costs in order to make the appropriate economic evaluations. Those non-federal tasks are:

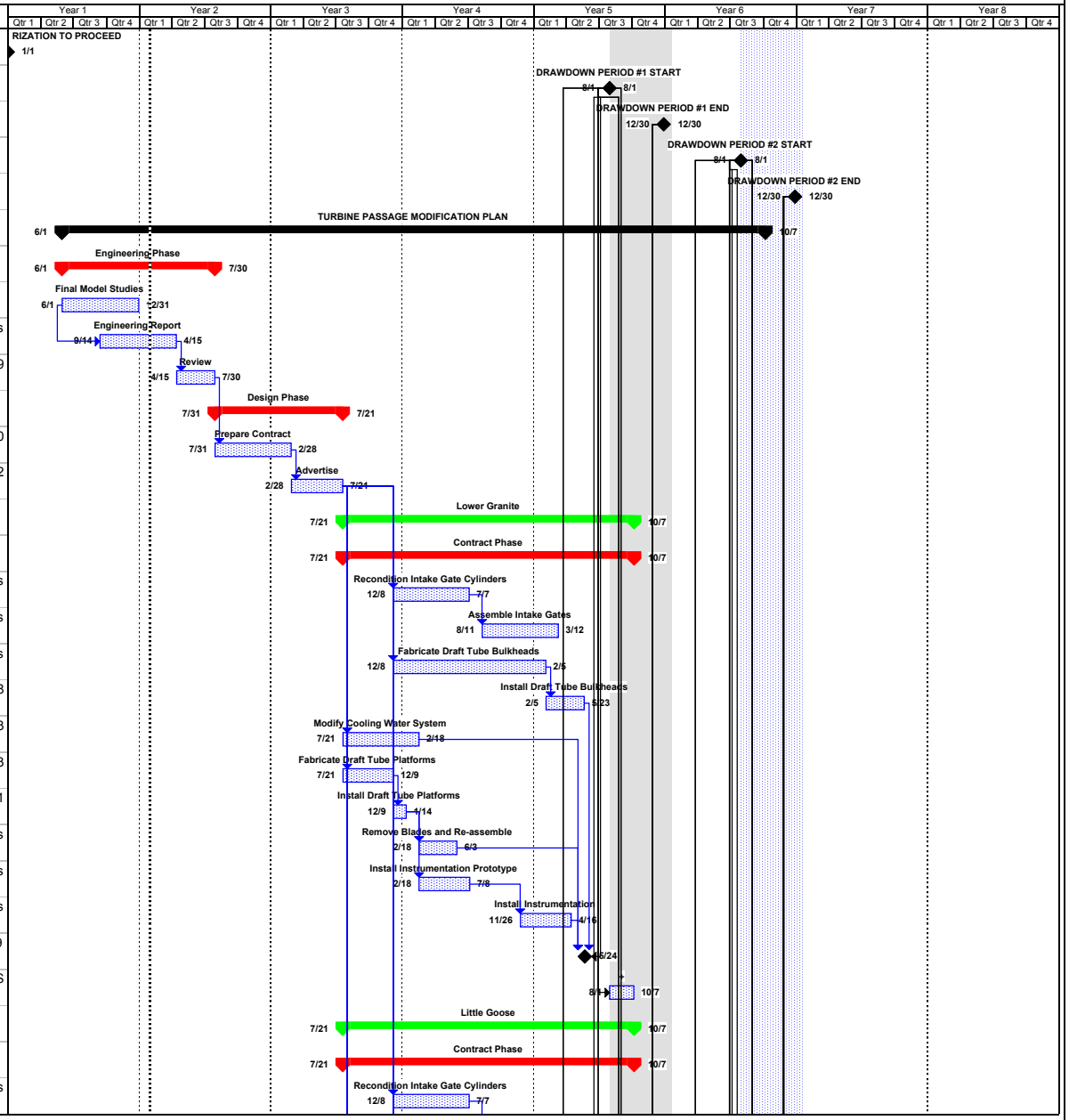
- Irrigation systems modification
- Water well modification
- Potlatch Corporation water intake modification
- Other water intakes modification
- Potlatch Corporation effluent diffuser modification
- PG&E gas transmission main crossings modification

W.3.16 Concrete Structures Removal

Schedules were not developed for this task. The purpose of providing a cost estimate for full removal of concrete structures is to provide an estimate of the cost of full removal. It is not a task that is part of the recommended activities to implement drawdown.

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
1	CONGRESSIONAL AUTHORIZATION TO PROCEED	1 day	
2	DRAWDOWN PERIOD #1 START	0 days	
3	DRAWDOWN PERIOD #1 END	0 days	
4	DRAWDOWN PERIOD #2 START	0 days	
5	DRAWDOWN PERIOD #2 END	0 days	
6	**TURBINE PASSAGE MODIFICATION PLAN**	**1694 days**	
7	**Engineering Phase**	**364 days**	
8	Final Model Studies	182.5 days	
9	Engineering Report	182.7 days	8SS+90 days
10	Review	91.3 days	9
11	**Design Phase**	**304.2 days**	
12	Prepare Contract	182.5 days	10
13	Advertise	121.7 days	12
	Lower Granite	**696.8 days**	
	Contract Phase	**696.8 days**	
	Recondition Intake Gate Cylinders	182.5 days	13FS+120 days
	Assemble Intake Gates	182.5 days	16FS+30 days
18	Fabricate Draft Tube Bulkheads	365 days	13FS+120 days
19	Install Draft Tube Bulkheads	91.3 days	18
20	Modify Cooling Water System	182.5 days	13
21	Fabricate Draft Tube Platforms	121.7 days	13
22	Install Draft Tube Platforms	30.4 days	21
23	Remove Blades and Re-assemble	91.3 days	22FS+30 days
24	Install Instrumentation Prototype	121.7 days	22FS+30 days
25	Install Instrumentation	121.7 days	24FS+120 days
26	Complete Turbine Modifications	0 days	2SF-60 days,25,23,20,19
27	+	60 days	2SS
28	**Little Goose**	**696.8 days**	
29	**Contract Phase**	**696.8 days**	
30	Recondition Intake Gate Cylinders	182.5 days	13FS+120 days

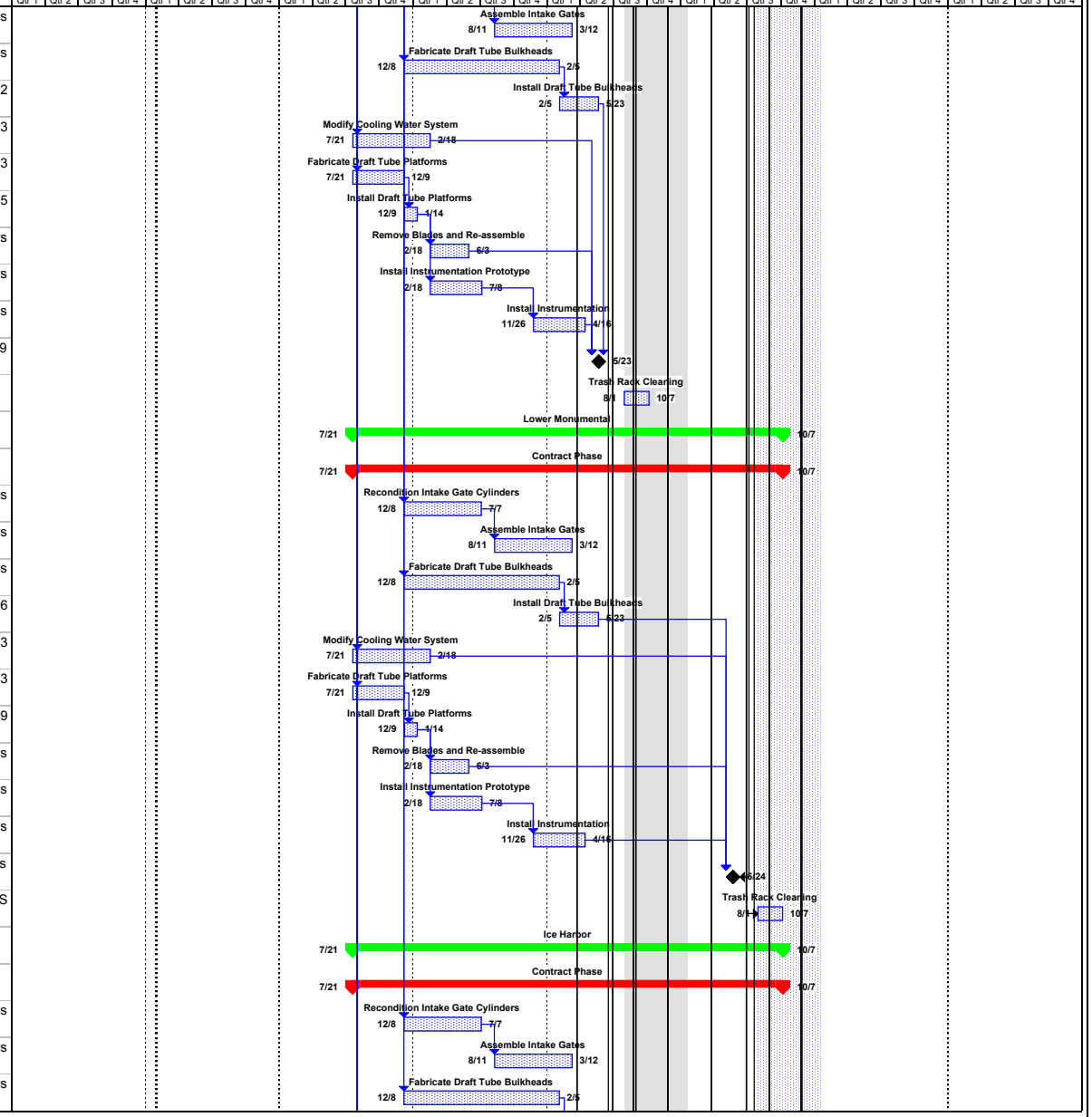


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
31	Assemble Intake Gates	182.5 days	30FS+30 days
32	Fabricate Draft Tube Bulkheads	365 days	13FS+120 days
33	Install Draft Tube Bulkheads	91.3 days	32
34	Modify Cooling Water System	182.5 days	13
35	Fabricate Draft Tube Platforms	121.7 days	13
36	Install Draft Tube Platforms	30.4 days	35
37	Remove Blades and Re-assemble	91.3 days	36FS+30 days
38	Install Instrumentation Prototype	121.7 days	36FS+30 days
39	Install Instrumentation	121.7 days	38FS+120 days
40	Complete Turbine Modifications	0 days	33,34,37,39
41	Trash Rack Cleaning	60 days	
42	**Lower Monumental**	**1025.8 days**	
43	**Contract Phase**	**1025.8 days**	
	Recondition Intake Gate Cylinders	182.5 days	13FS+120 days
	Assemble Intake Gates	182.5 days	44FS+30 days
	Fabricate Draft Tube Bulkheads	365 days	13FS+120 days
	Install Draft Tube Bulkheads	91.3 days	46
48	Modify Cooling Water System	182.5 days	13
49	Fabricate Draft Tube Platforms	121.7 days	13
50	Install Draft Tube Platforms	30.4 days	49
51	Remove Blades and Re-assemble	91.3 days	50FS+30 days
52	Install Instrumentation Prototype	121.7 days	50FS+30 days
53	Install Instrumentation	121.7 days	52FS+120 days
54	Complete Turbine Modifications	0 days	47,48,51,53,4SF-60 days
55	Trash Rack Cleaning	60 days	4SS
56	**Ice Harbor**	**1025.8 days**	
57	**Contract Phase**	**1025.8 days**	
58	Recondition Intake Gate Cylinders	182.5 days	13FS+120 days
59	Assemble Intake Gates	182.5 days	58FS+30 days
60	Fabricate Draft Tube Bulkheads	365 days	13FS+120 days

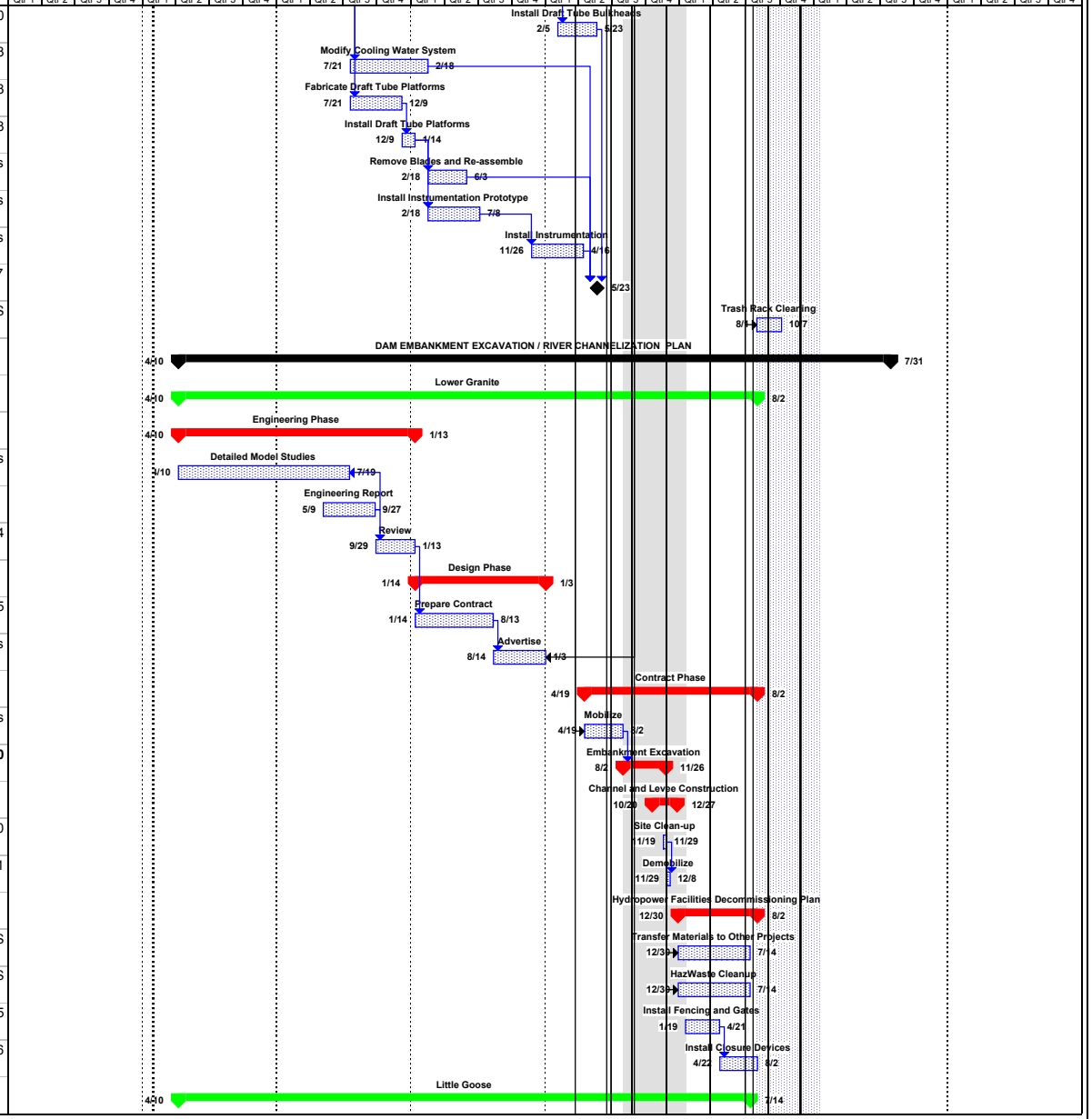


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
61	Install Draft Tube Bulkheads	91.3 days	60
62	Modify Cooling Water System	182.5 days	13
63	Fabricate Draft Tube Platforms	121.7 days	13
64	Install Draft Tube Platforms	30.4 days	63
65	Remove Blades and Re-assemble	91.3 days	64FS+30 days
66	Install Instrumentation Prototype	121.7 days	64FS+30 days
67	Install Instrumentation	121.7 days	66FS+120 days
68	Complete Turbine Modifications	0 days	61,62,65,67
69	Trash Rack Cleaning	60 days	4SS
70	**DAM EMBANKMENT EXCAVATION / RIVER CHANNELIZATION PLAN**	**1685.5 days**	
71	**Lower Granite**	**1368 days**	
72	**Engineering Phase**	**552 days**	
73	Detailed Model Studies	400 days	74FF-60 days
	Engineering Report	121.7 days	
	Review	91.3 days	74
	Design Phase	**304.5 days**	
	Prepare Contract	182.5 days	75
78	Advertise	121.7 days	77,2FF-180 days
79	**Contract Phase**	**421 days**	
80	Mobilize	91.3 days	2SS-90 days
81	**Embankment Excavation**	**101.4 days**	**80**
94	**Channel and Levee Construction**	**58 days**	
101	Site Clean-up	8 days	100
102	Demobilize	8 days	101
103	**Hydropower Facilities Decommissioning Plan**	**200 days**	
104	Transfer Materials to Other Projects	182.5 days	3SS
105	HazWaste Cleanup	182.5 days	3SS
106	Install Fencing and Gates	91 days	95
107	Install Closure Devices	91 days	106
108	**Little Goose**	**1350.5 days**	

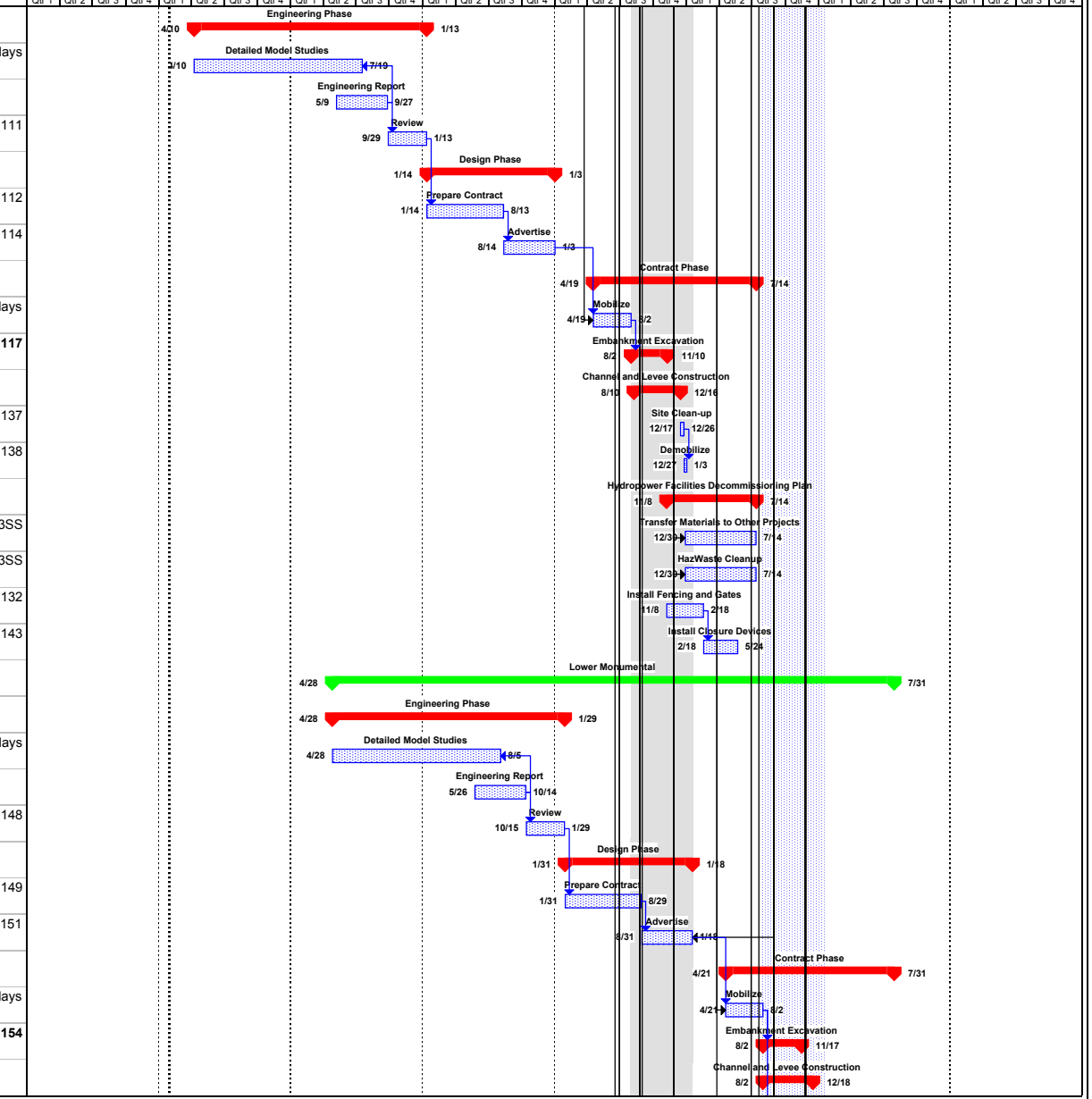


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
109	**Engineering Phase**	**552 days**	
110	Detailed Model Studies	400 days	111FF-60 days
111	Engineering Report	121.7 days	
112	Review	91.3 days	111
113	**Design Phase**	**304.2 days**	
114	Prepare Contract	182.5 days	112
115	Advertise	121.7 days	114
116	**Contract Phase**	**403.5 days**	
117	Mobilize	91.3 days	115,2SS-90 days
118	**Embankment Excavation**	**87.7 days**	**117**
130	**Channel and Levee Construction**	**111 days**	
138	Site Clean-up	8 days	137
139	Demobilize	8 days	138
	Hydropower Facilities Decommissioning Plan	**227.2 days**	
	Transfer Materials to Other Projects	182.5 days	3SS
	HazWaste Cleanup	182.5 days	3SS
143	Install Fencing and Gates	91 days	132
144	Install Closure Devices	91 days	143
145	**Lower Monumental**	**1357.5 days**	
146	**Engineering Phase**	**552 days**	
147	Detailed Model Studies	400 days	148FF-60 days
148	Engineering Report	121.7 days	
149	Review	91.3 days	148
150	**Design Phase**	**305.5 days**	
151	Prepare Contract	182.5 days	149
152	Advertise	121.7 days	4FF-180 days,151
153	**Contract Phase**	**409.5 days**	
154	Mobilize	91.3 days	152,4SS-90 days
155	**Embankment Excavation**	**96 days**	**154**
167	**Channel and Levee Construction**	**125 days**	



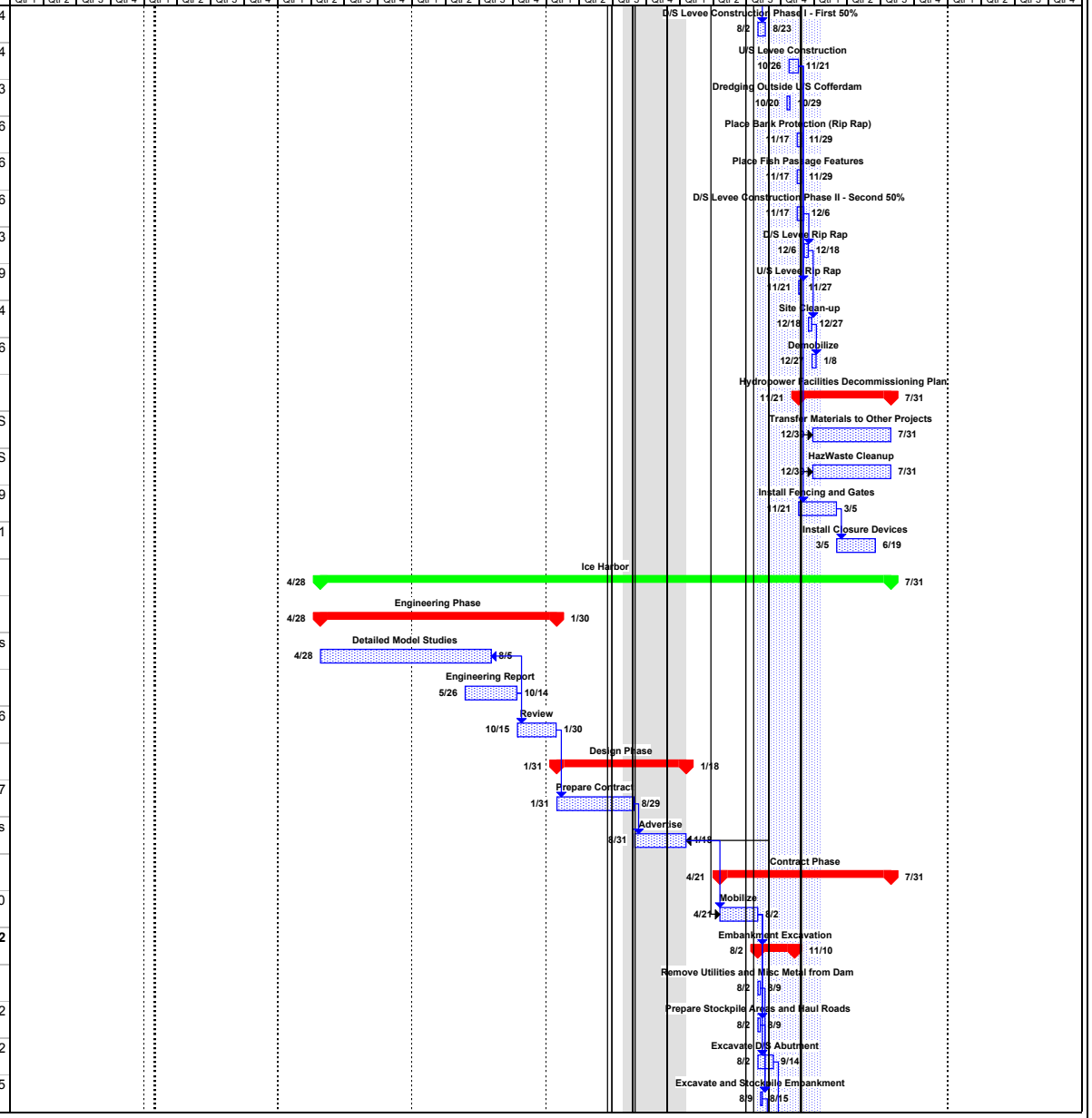
D-W-10

Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
168	D/S Levee Construction Phase I - First 50%	19 days	154
169	U/S Levee Construction	24 days	164
170	Dredging Outside U/S Cofferdam	9 days	163
171	Place Bank Protection (Rip Rap)	12 days	166
172	Place Fish Passage Features	12 days	166
173	D/S Levee Construction Phase II - Second 50%	19 days	166
174	D/S Levee Rip Rap	10 days	173
175	U/S Levee Rip Rap	6 days	169
176	Site Clean-up	8 days	174
177	Demobilize	10 days	176
178	**Hydropower Facilities Decommissioning Plan**	**218.2 days**	
179	Transfer Materials to Other Projects	182.5 days	5SS
180	HazWaste Cleanup	182.5 days	5SS
	Install Fencing and Gates	91 days	169
	Install Closure Devices	91 days	181
	Ice Harbor	**1357.5 days**	
	Engineering Phase	**552 days**	
185	Detailed Model Studies	400 days	186FF-60 days
186	Engineering Report	121.7 days	
187	Review	91.3 days	186
188	**Design Phase**	**305.5 days**	
189	Prepare Contract	182.5 days	187
190	Advertise	121.7 days	189,4FF-180 days
191	**Contract Phase**	**409.5 days**	
192	Mobilize	91.3 days	4SS-90 days,190
193	**Embankment Excavation**	**90 days**	**192**
194	Remove Utilities and Misc Metal from Dam	7 days	
195	Prepare Stockpile Areas and Haul Roads	7 days	192
196	Excavate D/S Abutment	38 days	192
197	Excavate and Stockpile Embankment	5 days	194,195

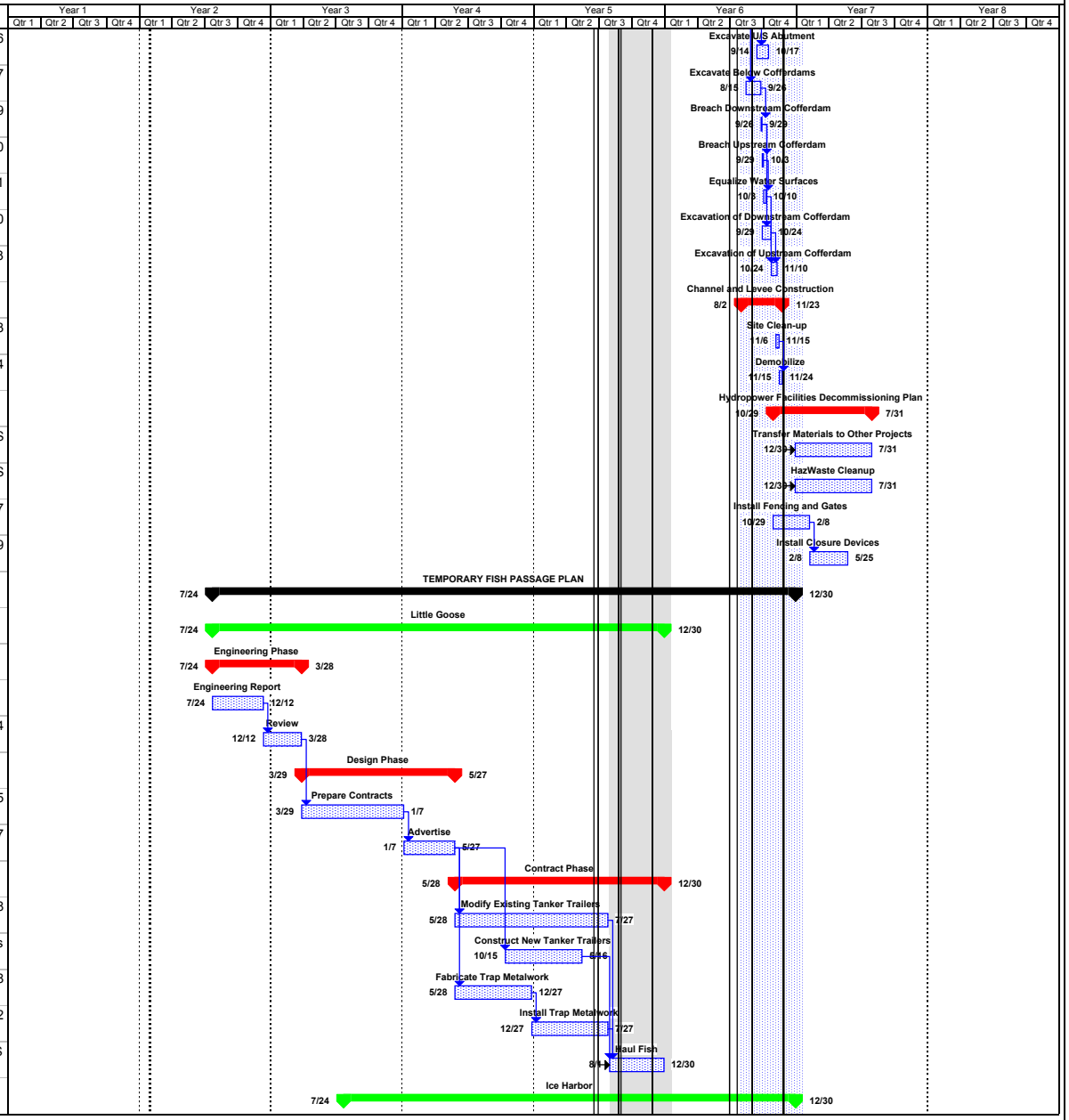


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
198	Excavate U/S Abutment	29 days	196
199	Excavate Below Cofferdams	36 days	197
200	Breach Downstream Cofferdam	3 days	199
201	Breach Upstream Cofferdam	3 days	200
202	Equalize Water Surfaces	6 days	201
203	Excavation of Downstream Cofferdam	23 days	200
204	Excavation of Upstream Cofferdam	16 days	202,203
205	**Channel and Levee Construction**	**102 days**	
214	Site Clean-up	8 days	213
215	Demobilize	9 days	214
216	**Hydropower Facilities Decommissioning Plan**	**239.2 days**	
217	Transfer Materials to Other Projects	182.5 days	5SS
218	HazWaste Cleanup	182.5 days	5SS
	Install Fencing and Gates	91 days	207
	Install Closure Devices	91 days	219
	TEMPORARY FISH PASSAGE PLAN	**1414 days**	
	Little Goose	**1079 days**	
223	**Engineering Phase**	**213 days**	
224	Engineering Report	121.7 days	
225	Review	91.3 days	224
226	**Design Phase**	**365 days**	
227	Prepare Contracts	243.3 days	225
228	Advertise	121.7 days	227
229	**Contract Phase**	**501 days**	
230	Modify Existing Tanker Trailers	365 days	228
231	Construct New Tanker Trailers	182.5 days	228FS+120 days
232	Fabricate Trap Metalwork	182.5 days	228
233	Install Trap Metalwork	182.5 days	232
234	Haul Fish	132 days	230,231,233,2SS
235	**Ice Harbor**	**1101 days**	



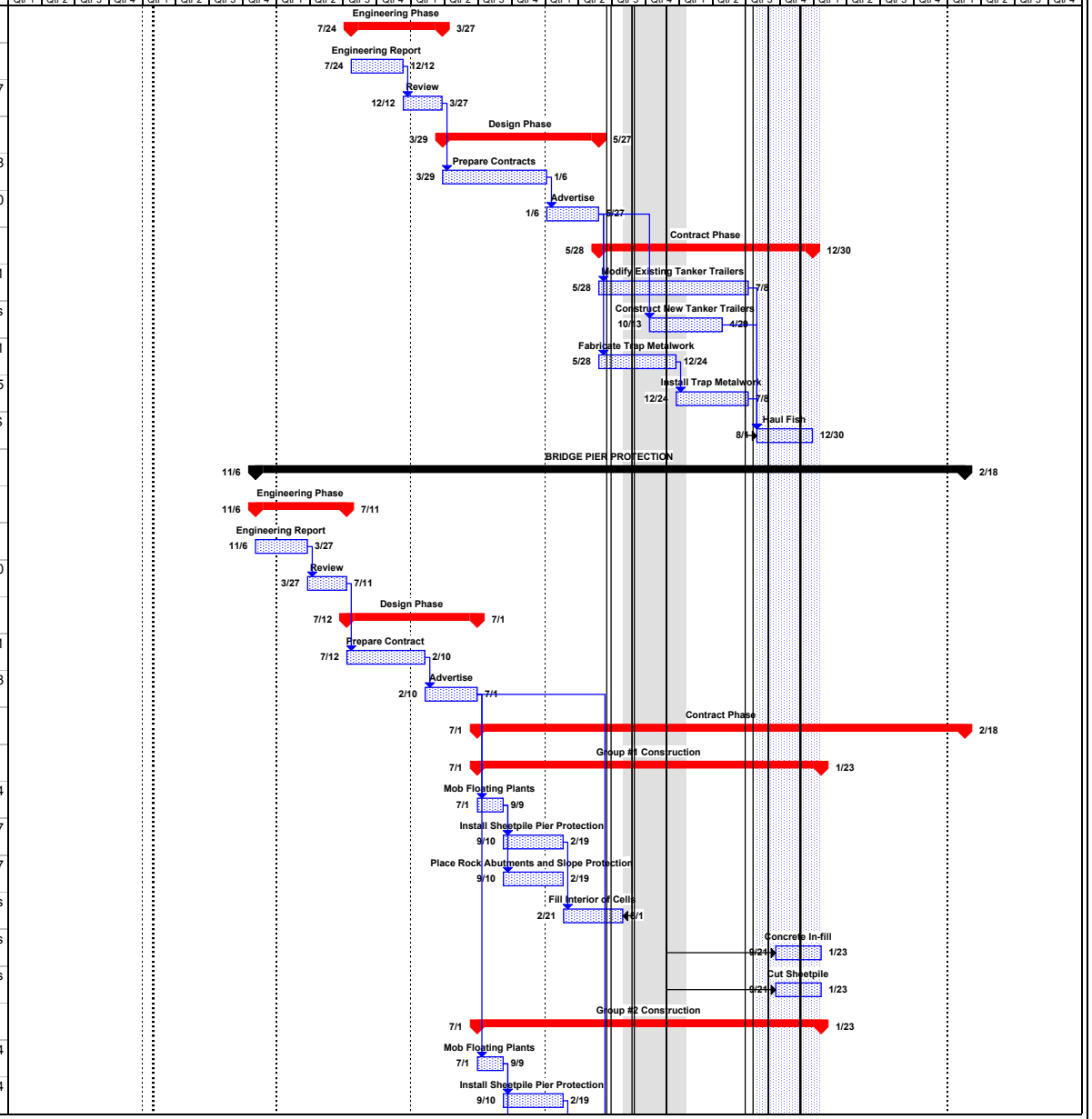
D-W-12

Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
236	**Engineering Phase**	**213 days**	
237	Engineering Report	121.7 days	
238	Review	91.3 days	237
239	**Design Phase**	**365 days**	
240	Prepare Contracts	243.3 days	238
241	Advertise	121.7 days	240
242	**Contract Phase**	**523 days**	
243	Modify Existing Tanker Trailers	365 days	241
244	Construct New Tanker Trailers	182.5 days	241FS+120 days
245	Fabricate Trap Metalwork	182.5 days	241
246	Install Trap Metalwork	182.5 days	245
247	Haul Fish	138 days	243,244,246,4SS
248	**BRIDGE PIER PROTECTION**	**1678.3 days**	
	Engineering Phase	**213 days**	
	Engineering Report	121.7 days	
	Review	91.3 days	250
	Design Phase	**304.2 days**	
253	Prepare Contract	182.5 days	251
254	Advertise	121.7 days	253
255	**Contract Phase**	**1161.1 days**	
256	**Group #1 Construction**	**826.1 days**	
257	Mob Floating Plants	60.8 days	254
258	Install Sheetpile Pier Protection	140 days	257
259	Place Rock Abutments and Slope Protection	140 days	257
260	Fill Interior of Cells	140 days	258,2SF-60 days
261	Concrete In-fill	112 days	3SS+243.3 days
262	Cut Sheetpile	112 days	3SS+243.3 days
263	**Group #2 Construction**	**826.1 days**	
264	Mob Floating Plants	60.8 days	254
265	Install Sheetpile Pier Protection	140 days	264



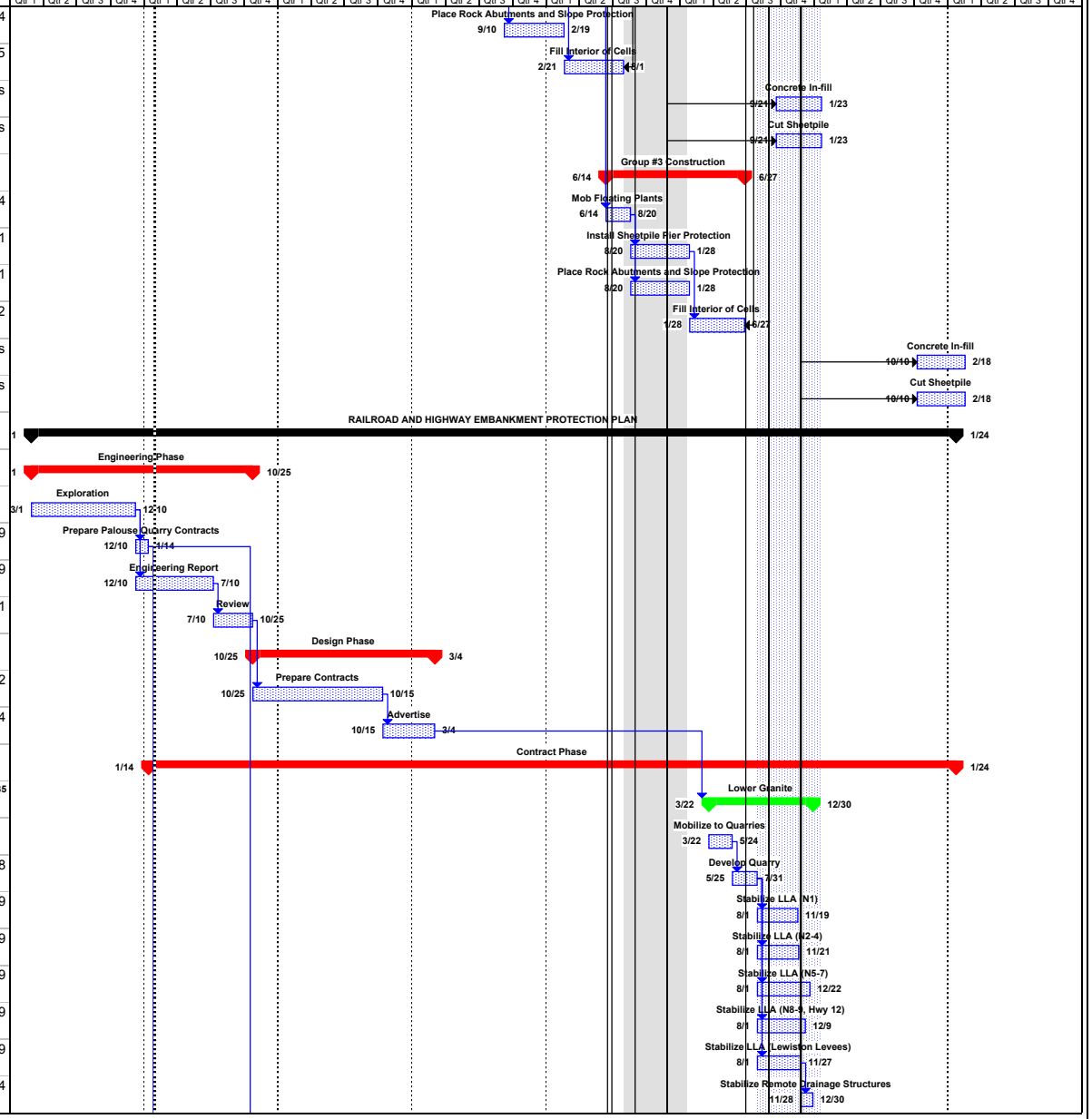
D-W-13

Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
266	Place Rock Abutments and Slope Protection	140 days	264
267	Fill Interior of Cells	140 days	2SF-60 days,265
268	Concrete In-fill	112 days	3SS+243.3 days
269	Cut Sheetpile	112 days	3SS+243.3 days
270	**Group #3 Construction**	**340.8 days**	
271	Mob Floating Plants	60.8 days	254
272	Install Sheetpile Pier Protection	140 days	271
273	Place Rock Abutments and Slope Protection	140 days	271
274	Fill Interior of Cells	140 days	4SF-60 days,272
275	Concrete In-fill	112 days	5SS+243.3 days
276	Cut Sheetpile	112 days	5SS+243.3 days
277	**RAILROAD AND HIGHWAY EMBANKMENT PROTECTION PLAN**	**2185 days**	
278	**Engineering Phase**	**517.1 days**	
	Exploration	243.3 days	
	Prepare Palouse Quarry Contracts	30.4 days	279
	Engineering Report	182.5 days	279
	Review	91.3 days	281
283	**Design Phase**	**425.9 days**	
284	Prepare Contracts	304.2 days	282
285	Advertise	121.7 days	284
286	**Contract Phase**	**1911.3 days**	
287	**Lower Granite**	**258 days**	**285**
288	Mobilize to Quarries	60 days	
289	Develop Quarry	60 days	288
290	Stabilize LLA (N1)	100 days	289
291	Stabilize LLA (N2-4)	102 days	289
292	Stabilize LLA (N5-7)	131 days	289
293	Stabilize LLA (N8-9, Hwy 12)	120 days	289
294	Stabilize LLA (Lewiston Levees)	108 days	289
295	Stabilize Remote Drainage Structures	30 days	294

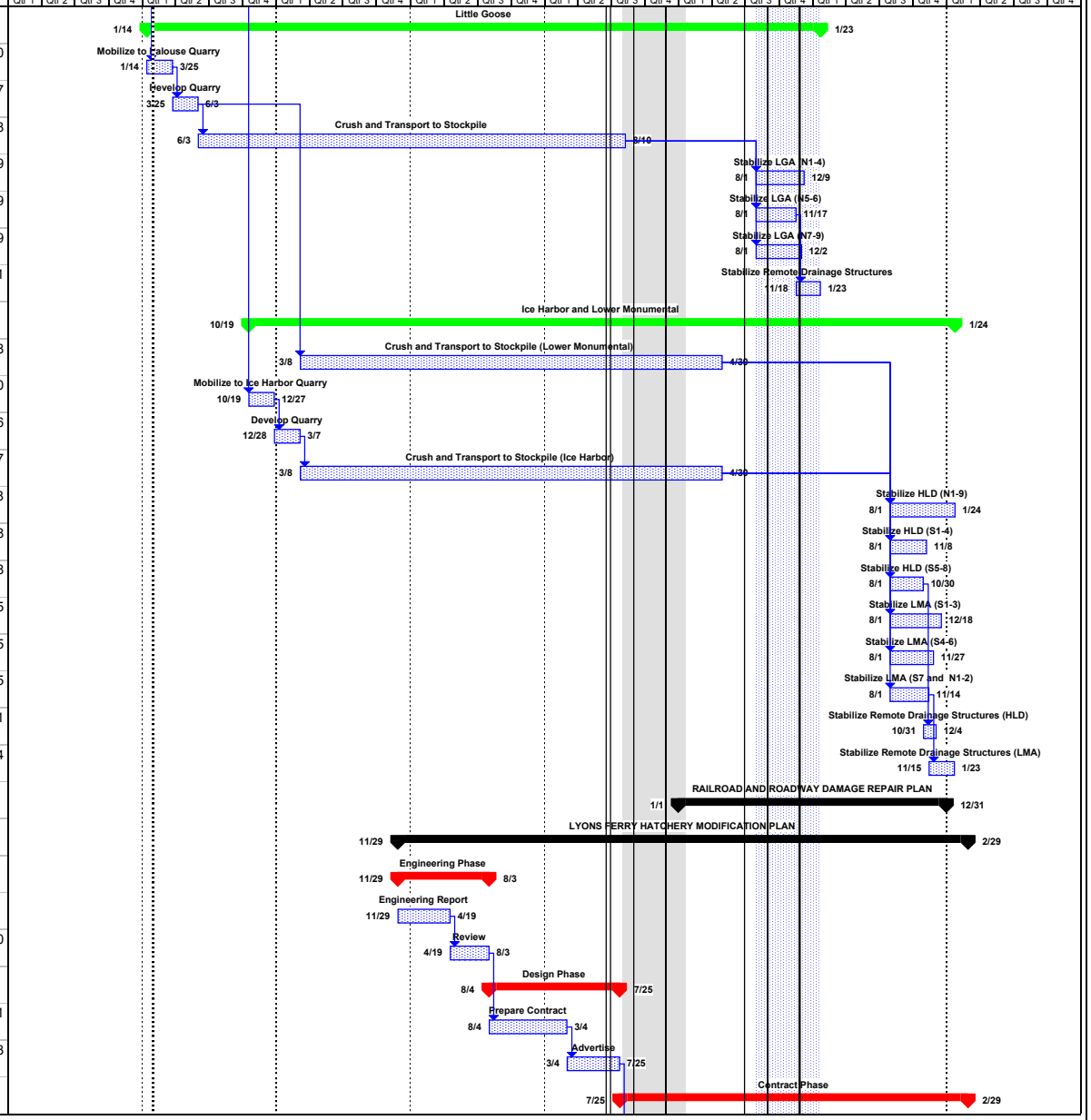


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Progress | Summary | Rolled Up Split | Rolled Up Progress | Project Summary
Split | Milestone | Rolled Up Task | Rolled Up Milestone | External Tasks

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
296	**Little Goose**	**1597.3 days**	
297	Mobilize to Palouse Quarry	60 days	280
298	Develop Quarry	60 days	297
299	Crush and Transport to Stockpile	1000 days	298
300	Stabilize LGA (N1-4)	120 days	299
301	Stabilize LGA (N5-6)	98 days	299
302	Stabilize LGA (N7-9)	113 days	299
303	Stabilize Remote Drainage Structures	60 days	301
304	**Ice Harbor and Lower Monumental**	**1673 days**	
305	Crush and Transport to Stockpile (Lower Monumental)	1000 days	298
306	Mobilize to Ice Harbor Quarry	60 days	280
307	Develop Quarry	60 days	306
308	Crush and Transport to Stockpile (Ice Harbor)	1000 days	307
	Stabilize HLD (N1-9)	152 days	305,308
	Stabilize HLD (S1-4)	86 days	308
	Stabilize HLD (S5-8)	78 days	308
	Stabilize LMA (S1-3)	120 days	305
313	Stabilize LMA (S4-6)	102 days	305
314	Stabilize LMA (S7 and N1-2)	91 days	305
315	Stabilize Remote Drainage Structures (HLD)	30 days	311
316	Stabilize Remote Drainage Structures (LMA)	60 days	314
317	**RAILROAD AND ROADWAY DAMAGE REPAIR PLAN**	**647 days**	
318	**LYONS FERRY HATCHERY MODIFICATION PLAN**	**1355.1 days**	
319	**Engineering Phase**	**213 days**	
320	Engineering Report	121.7 days	
321	Review	91.3 days	320
322	**Design Phase**	**304.2 days**	
323	Prepare Contract	182.5 days	321
324	Advertise	121.7 days	323
325	**Contract Phase**	**837.4 days**	

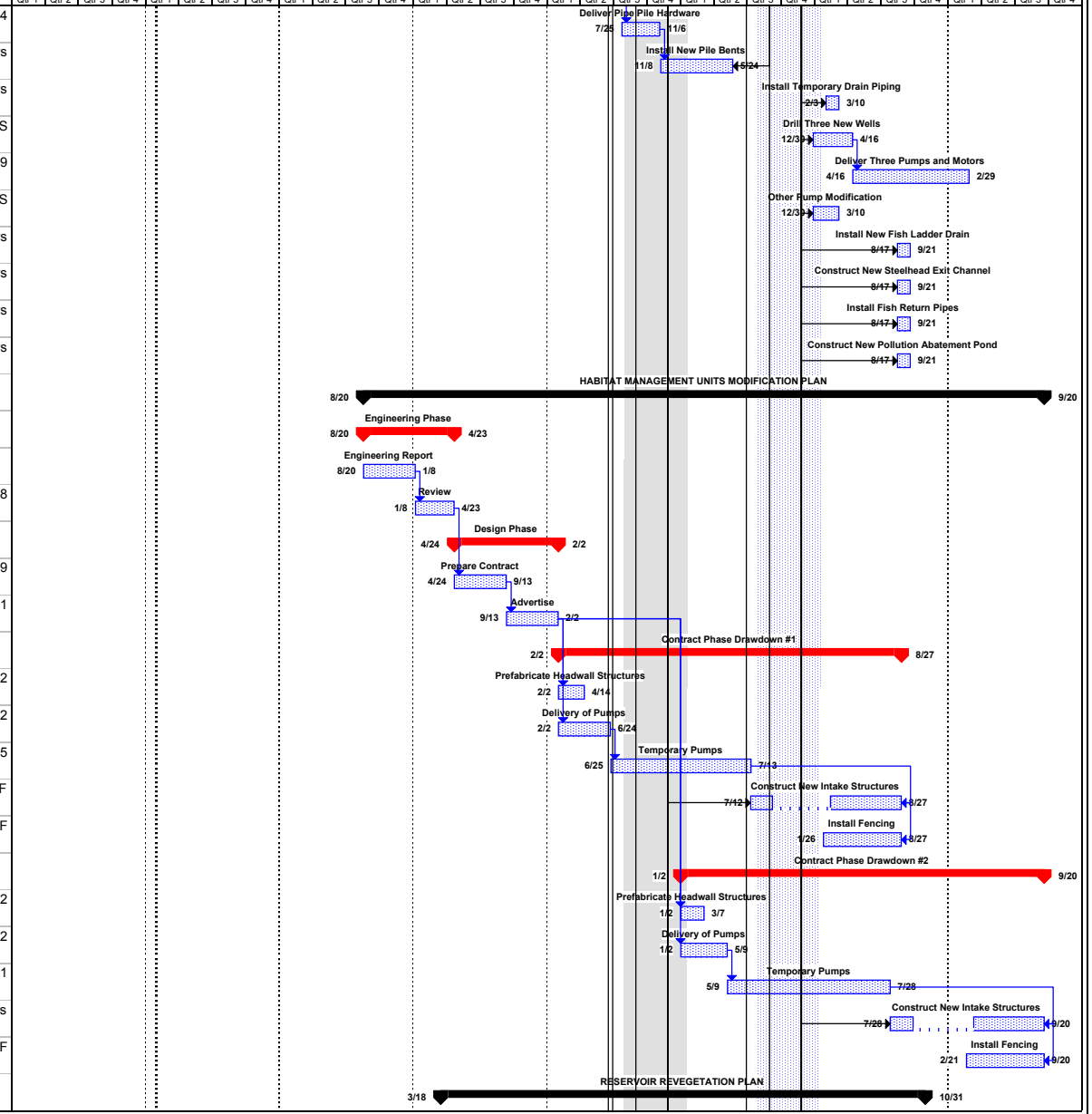


Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
326	Deliver Pipe Pile Hardware	91.3 days	324
327	Install New Pile Bents	182.5 days	326,4FF-60 days
328	Install Temporary Drain Piping	30.4 days	5SS+30 days
329	Drill Three New Wells	91.3 days	5SS
330	Deliver Three Pumps and Motors	273.8 days	329
331	Other Pump Modification	60.8 days	5SS
332	Install New Fish Ladder Drain	30.4 days	5SS+197 days
333	Construct New Steelhead Exit Channel	30.4 days	5SS+197 days
334	Install Fish Return Pipes	30.4 days	5SS+197 days
335	Construct New Pollution Abatement Pond	30.4 days	5SS+197 days
336	**HABITAT MANAGEMENT UNITS MODIFICATION PLAN**	**1618 days**	
337	**Engineering Phase**	**213 days**	
338	Engineering Report	121.7 days	
	Review	91.3 days	338
	Design Phase	**243.4 days**	
	Prepare Contract	121.7 days	339
	Advertise	121.7 days	341
343	**Contract Phase Drawdown #1**	**826.6 days**	
344	Prefabricate Headwall Structures	60.8 days	342
345	Delivery of Pumps	121.7 days	342
346	Temporary Pumps	344.9 days	345
347	Construct New Intake Structures	220 days	3SS+180 days,346FF
348	Install Fencing	182.5 days	347FF
349	**Contract Phase Drawdown #2**	**873 days**	
350	Prefabricate Headwall Structures	60.8 days	342
351	Delivery of Pumps	121.7 days	342
352	Temporary Pumps	391.3 days	351
353	Construct New Intake Structures	220 days	352FF,5SS+180 days
354	Install Fencing	182.5 days	353FF
355	**RESERVOIR REVEGETATION PLAN**	**1157.7 days**	



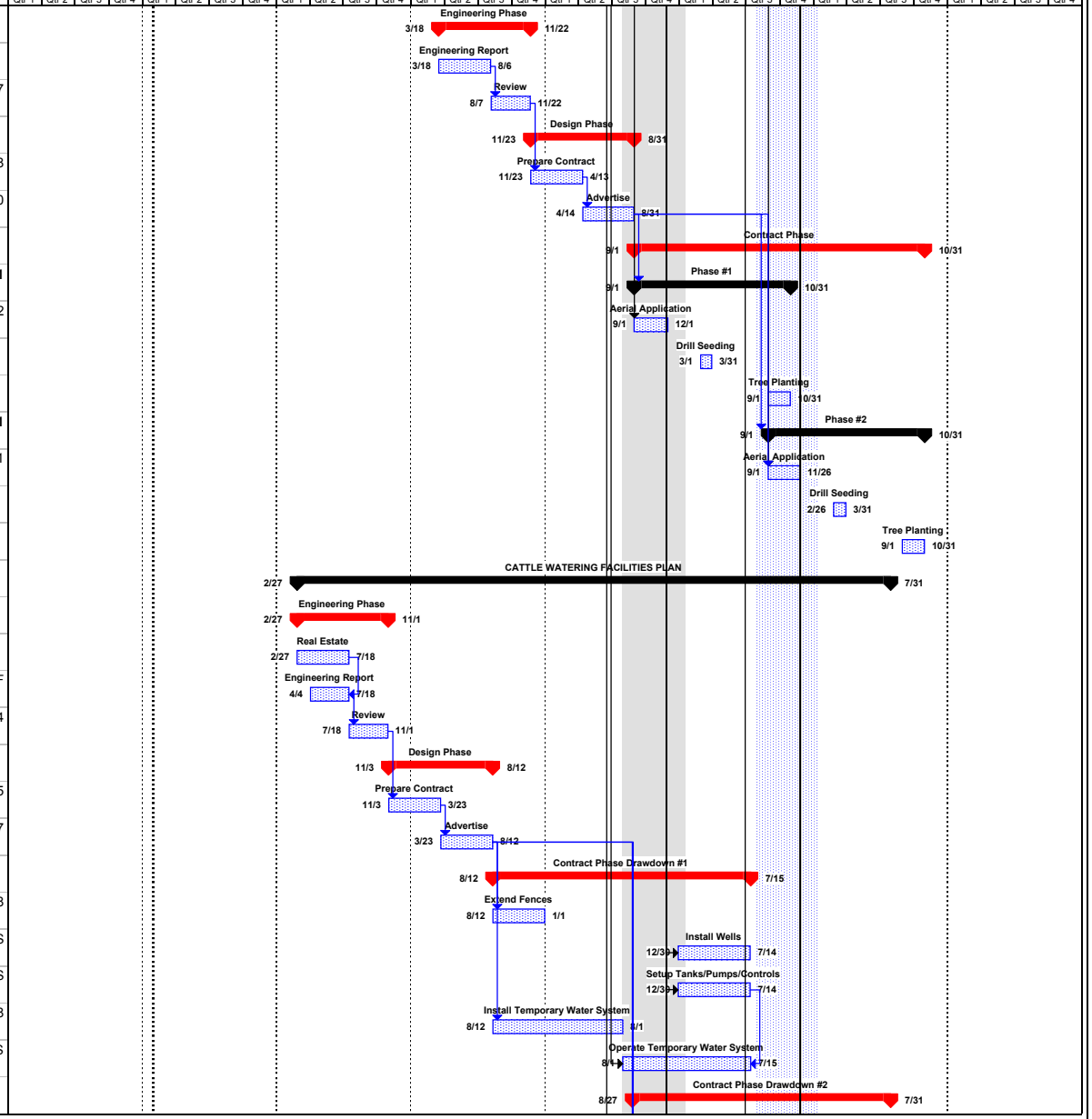
Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

D-W-16

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
356	**Engineering Phase**	**213.7 days**	
357	Engineering Report	121.7 days	
358	Review	91.3 days	357
359	**Design Phase**	**243.7 days**	
360	Prepare Contract	121.7 days	358
361	Advertise	121.7 days	360
362	**Contract Phase**	**700 days**	
363	**Phase #1**	**384 days**	**361**
364	Aerial Application	79 days	2
365	Drill Seeding	31 days	
366	Tree Planting	55 days	
367	**Phase #2**	**371 days**	**361**
368	Aerial Application	79 days	4,361
	Drill Seeding	30 days	
	Tree Planting	52 days	
	CATTLE WATERING FACILITIES PLAN	**1408.5 days**	
	Engineering Phase	**213 days**	
373	Real Estate	121.7 days	
374	Engineering Report	90 days	373FF
375	Review	91.3 days	374
376	**Design Phase**	**243.4 days**	
377	Prepare Contract	121.7 days	375
378	Advertise	121.7 days	377
379	**Contract Phase Drawdown #1**	**618.6 days**	
380	Extend Fences	121.7 days	378
381	Install Wells	182.5 days	3SS
382	Setup Tanks/Pumps/Controls	182.5 days	3SS
383	Install Temporary Water System	304.2 days	378
384	Operate Temporary Water System	315 days	382FF,2SS
385	**Contract Phase Drawdown #2**	**624.5 days**	



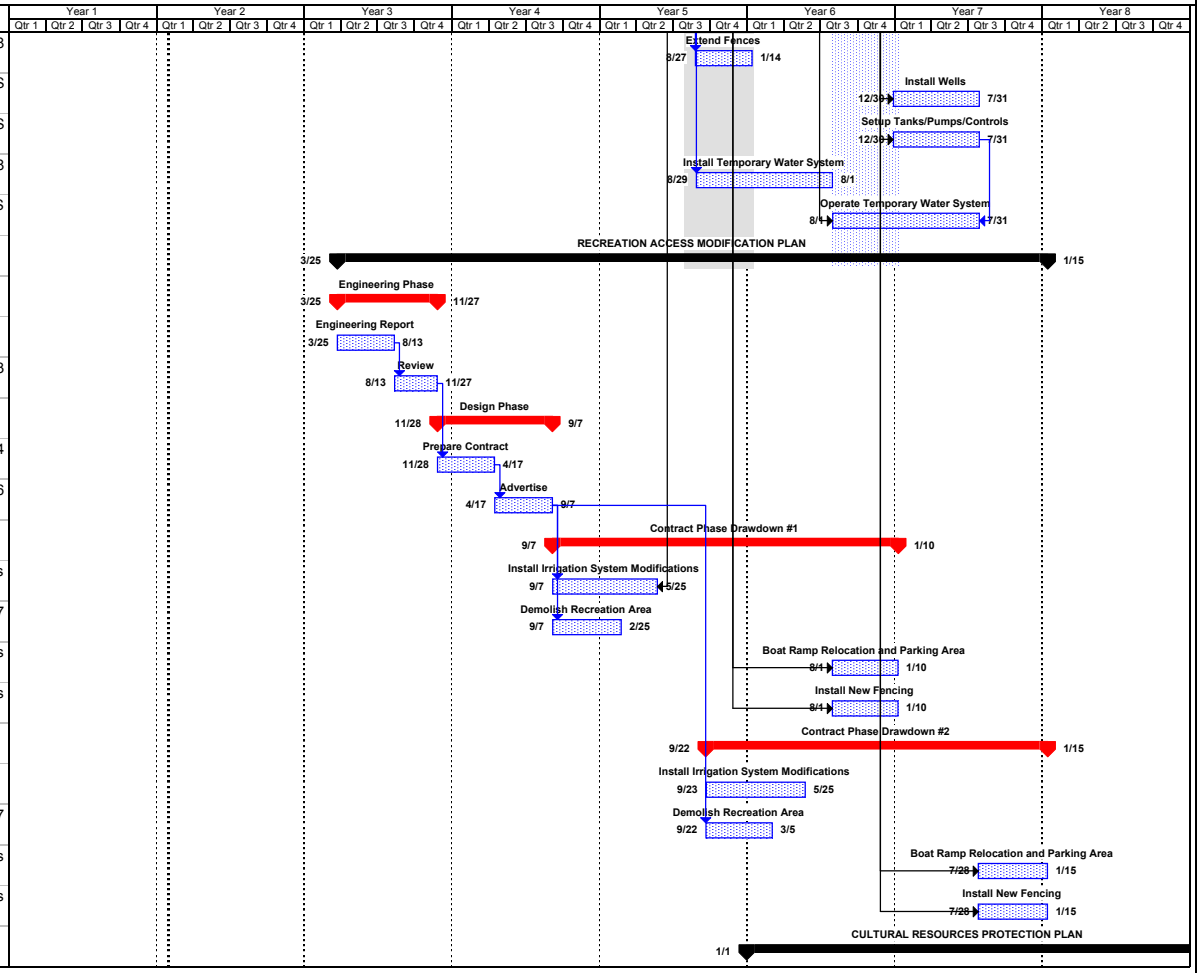
D-W-17

Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

Figure W1
Drawdown Implementation Schedule

ID	Task Name	Duration	Predecessors
386	Extend Fences	121.7 days	378
387	Install Wells	182.5 days	5SS
388	Setup Tanks/Pumps/Controls	182.5 days	5SS
389	Install Temporary Water System	304.2 days	378
390	Operate Temporary Water System	319 days	388FF,4SS
391	**RECREATION ACCESS MODIFICATION PLAN**	**1531 days**	
392	**Engineering Phase**	**213 days**	
393	Engineering Report	121.7 days	
394	Review	91.3 days	393
395	**Design Phase**	**243.4 days**	
396	Prepare Contract	121.7 days	394
397	Advertise	121.7 days	396
398	**Contract Phase Drawdown #1**	**757.6 days**	
	Install Irrigation System Modifications	223 days	397,2SF-60 days
	Demolish Recreation Area	147 days	397
	Boat Ramp Relocation and Parking Area	147 days	3SS+180 days
	Install New Fencing	147 days	3SS+180 days
403	**Contract Phase Drawdown #2**	**747 days**	
404	Install Irrigation System Modifications	223 days	
405	Demolish Recreation Area	147 days	397
406	Boat Ramp Relocation and Parking Area	147 days	5SS+180 days
407	Install New Fencing	147 days	5SS+180 days
408	**CULTURAL RESOURCES PROTECTION PLAN**	**961 days**	



D-W-18

Project: Drawdown Implementation Schedule
Date: Mon 1/28/02

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary