BARNARD PENNECON

2018 North Dam Schedule

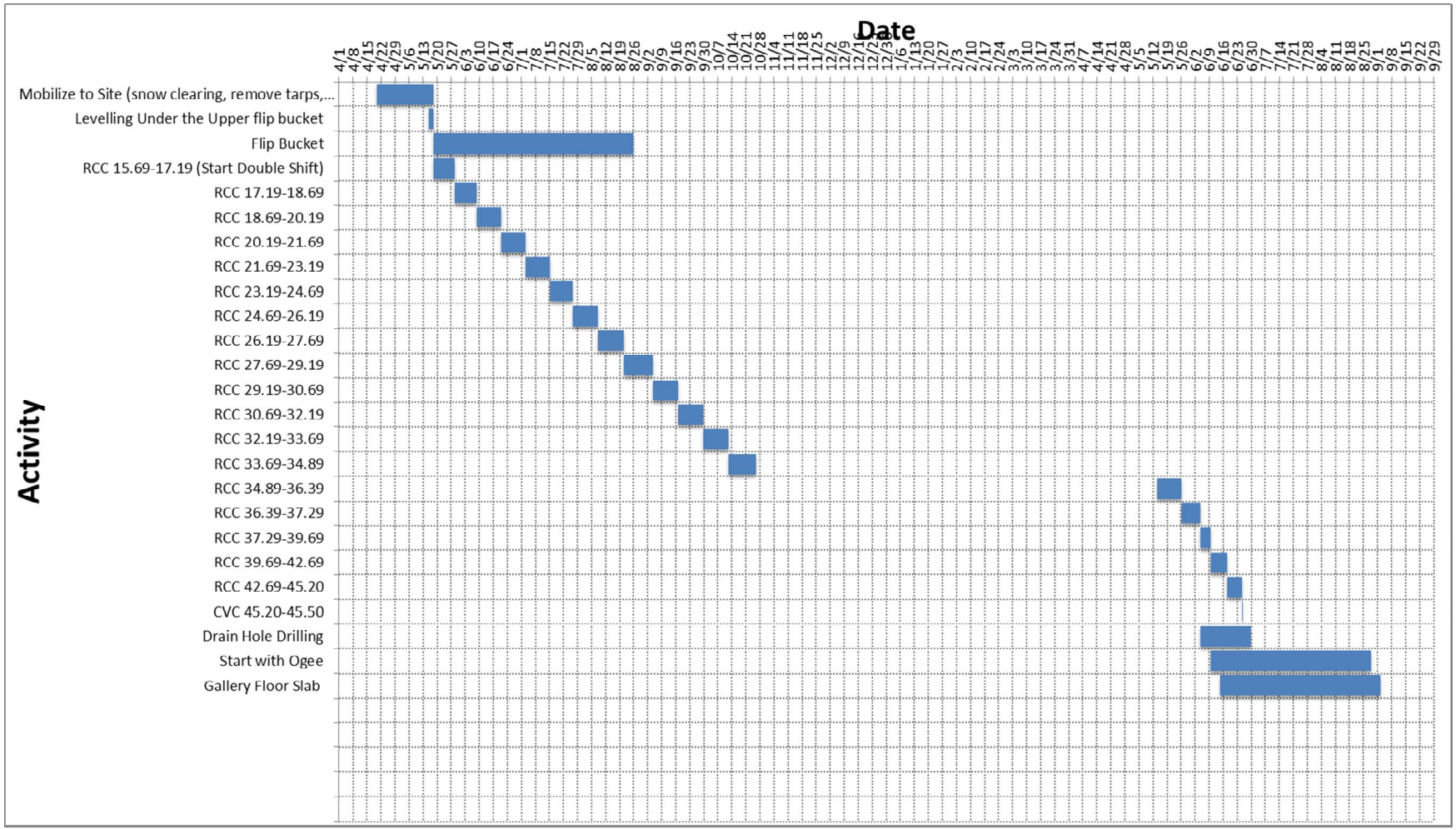
(utilizing RCC as per original construction methodology)

Task Name - RCC Construction Methodology	Quantity (m3)	Start	End
Mobilize to Site (snow clearing, remove tarps, Jump Forms etc)		20-Apr-18	18-May-18
Levelling Under the Upper flip bucket	800	16-May-18	18-May-18
Flip Bucket	8,970	18-May-18	26-Aug-18
RCC 15.69-17.19 (Start Double Shift)	10,670	18-May-18	28-May-18
RCC 17.19-18.69	11,100	28-May-18	8-Jun-18
RCC 18.69-20.19	10,950	8-Jun-18	20-Jun-18
RCC 20.19-21.69	10,820	20-Jun-18	2-Jul-18
RCC 21.69-23.19	10,300	2-Jul-18	15-Jul-18
RCC 23.19-24.69	9,970	15-Jul-18	26-Jul-18
RCC 24.69-26.19	9,410	26-Jul-18	8-Aug-18
RCC 26.19-27.69	9,060	8-Aug-18	21-Aug-18
RCC 27.69-29.19	8,540	21-Aug-18	4-Sep-18
RCC 29.19-30.69	7,540	4-Sep-18	17-Sep-18
RCC 30.69-32.19	6,950	17-Sep-18	29-Sep-18
RCC 32.19-33.69	6,300	29-Sep-18	12-Oct-18
RCC 33.69-34.89	5,430	12-Oct-18	25-Oct-18
RCC 34.89-36.39	4,930	13-May-19	26-May-19
RCC 36.39-37.29	3,300	26-May-19	4-Jun-19
RCC 37.29-39.69	1,840	4-Jun-19	9-Jun-19
RCC 39.69-42.69	1,980	9-Jun-19	17-Jun-19
RCC 42.69-45.20	1,860	17-Jun-19	25-Jun-19
CVC 45.20-45.50	250	25-Jun-19	25-Jun-19
Drain Hole Drilling		4-Jun-19	29-Jun-19
Start with Ogee	3,030	9-Jun-19	28-Aug-19
Gallery Floor Slab	300	14-Jun-19	2-Sep-19

BARNARD PENNECON

2018 North Dam Schedule

(utilizing RCC as per original construction methodology)



BARNARD PENNECON

2018 North Dam Schedule

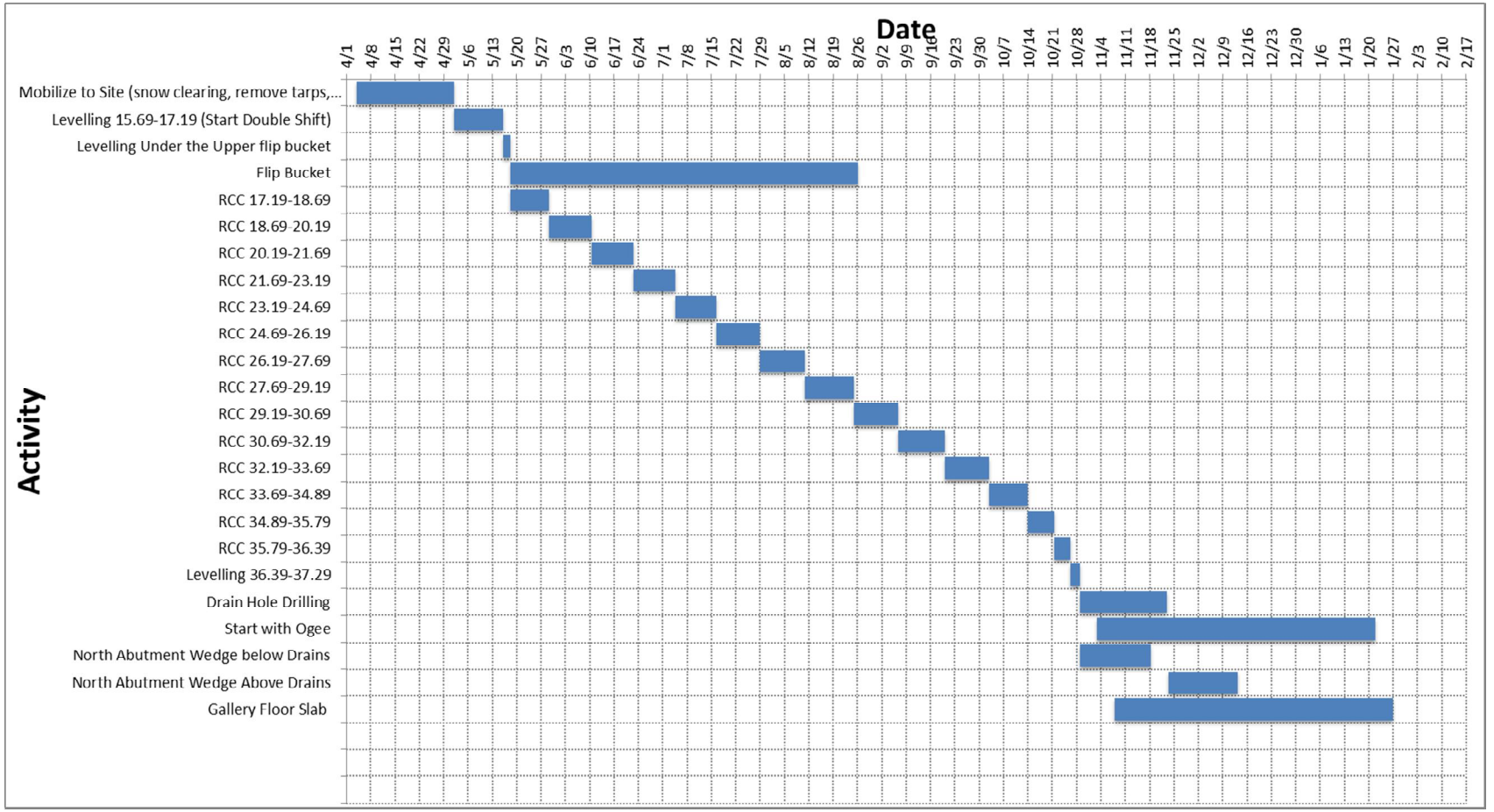
(utilizing RCC/Levelling Value Engineering Proposal)

Task Name - RCC / Levelling Value Engineering Proposal	Quantity (m3)	Start	End
Mobilize to Site (snow clearing, remove tarps, Jump Forms etc)		4-Apr-18	2-May-18
Levelling 15.69-17.19 (Start Double Shift)	10,670	2-May-18	16-May-18
Levelling Under the Upper flip bucket	800	16-May-18	18-May-18
Flip Bucket	8,970	18-May-18	26-Aug-18
RCC 17.19-18.69	11,100	18-May-18	29-May-18
RCC 18.69-20.19	10,950	29-May-18	10-Jun-18
RCC 20.19-21.69	10,820	10-Jun-18	22-Jun-18
RCC 21.69-23.19	10,300	22-Jun-18	4-Jul-18
RCC 23.19-24.69	9,970	4-Jul-18	16-Jul-18
RCC 24.69-26.19	9,410	16-Jul-18	28-Jul-18
RCC 26.19-27.69	9,060	28-Jul-18	10-Aug-18
RCC 27.69-29.19	8,040	10-Aug-18	24-Aug-18
RCC 29.19-30.69	7,040	24-Aug-18	6-Sep-18
RCC 30.69-32.19	6,000	6-Sep-18	20-Sep-18
RCC 32.19-33.69	5,110	20-Sep-18	2-Oct-18
RCC 33.69-34.89	3,560	2-Oct-18	13-Oct-18
RCC 34.89-35.79	2,420	13-Oct-18	21-Oct-18
RCC 35.79-36.39	1,490	21-Oct-18	26-Oct-18
Levelling 36.39-37.29	2,000	26-Oct-18	28-Oct-18
Drain Hole Drilling		28-Oct-18	22-Nov-18
Start with Ogee	3,030	2-Nov-18	21-Jan-19
North Abutment Wedge below Drains	7,570	28-Oct-18	18-Nov-18
North Abutment Wedge Above Drains	5,000	23-Nov-18	13-Dec-18
Gallery Floor Slab	300	7-Nov-18	26-Jan-19

BARNARD PENNECON

2018 North Dam Schedule

(utilizing RCC/Levelling Value Engineering Proposal)



Schedule Comparison

	Utilizing RCC as shown on Drawings		Substituting some areas with Leveling as Presented Nov 30th	
Activity	Start Date	Finish Date	Start Date	Finish Date
RCC to Ele. 18.69	18-May-18	8-Jun-18	2-May-18	29-May-18
RCC to Ele. 37.29	8-Jun-18	4-Jun-19	29-May-18	28-Oct-18
RCC Complete		25-Jun-19		28-Oct-18
Flip Bucket	18-May-18	26-Aug-18	18-May-18	26-Aug-18
OGEE	9-Jun-19	28-Aug-19	2-Nov-18	21-Jan-19
M7b (North Dam Complete)		2-Sep-19		26-Jan-19

There are two different schedules being prepared. The first schedule titled "RCC Construction Methodology was created using the following information.

- The basis of the schedule is the Re-Baseline Schedule. All productions are the same as what was included in the rebaseline, however they have been adjusted to reflect the actual time lost due to weather in 2017 which was approximately 30%
- The schedule logic remains the same as the rebaseline.
- The Season start and end dates have been adjusted to reflect actual weather information from 2017, not the weather window provided in the contract.

The second schedule titled "RCC/Leveling Value Engineering Proposal" was created using the following.

- The basis of the schedule is the Re-Baseline Schedule. All productions are the same as what was included in the rebaseline, however they have been adjusted to reflect the actual time lost due to weather in 2017 which was approximately 30%.
- The schedule logic has been adjusted with the replacement of RCC with leveling concrete in certain locations to allow for construction to proceed in weather where it would be inefficient to place RCC. In addition to this the use of the North Abutment Wedge allows for an early start to the Ogee Crest which allows for Ogee crest placements to be progressing while the dam is being topped out on the north end.
- The Season start and end dates have been adjusted to reflect actual weather information from 2017, not the weather window provided in the contract. With the replacement of RCC with Leveling we are able to continue to place Leveling later in the year. This mitigates the weather risk of pushing out into another construction season.

BPLP is proposing placing levelling concrete in lieu of RCC at multiple locations, mitigating both schedule (weather) and labor risk. Even though production is greater for RCC, overall labor hours are estimated to be less due to resource requirements. The estimate assumes crew size and production for formwork and surface preparation are equal. Also included in this estimate is the labor savings associated with not backfilling the upstream side of the dam for access. If BPLP was to place RCC at higher elevations, additional earthwork would be necessary to maintain drive on/drive off access.

As in the 2017 construction season, RCC would be placed using the slope layer method. Laborers will be required for spotting, RCC placement, facing placement and vibration, and contraction joint installation. Operators will be required for RCC placement, RCC compaction, CVC vibration, contraction joint installation, and cleaning. Masons will be necessary to operate the grout mixer and to grout the lift as required. Formwatch will be completed by carpenters. Teamsters will operate 740EJ and mixer trucks to transport the concrete to the dam.

Levelling would be placed using a method similar to slope layer. Laborers will be required for spotting, levelling and facing placement and vibration, and to operate the pump truck. Operators will be required for lift support. Formwatch and stay form installation at the contraction joints will be completed by carpenters. Teamsters will operate mixer trucks to

transport the concrete to the dam.

By utilizing leveling concrete from elevation 15.69 to 17.29 BPLP will be able to midigate the weather risk and will be able to place concrete earlier in the year. In addition do to limitations with running compaction equipment over the top of the gallery RCC productions will be less in this area. By utilizing Leveling BPLP estimates that the start date could be moved up approximately 2 weeks which in turn moves the end date of RCC up.

By leaving out the wedge of RCC shown on the north abutment BPLP will be able to place RCC in the overflow section of the dam up to elevation 37.29 faster. This will allow for the Ogee crest to start sooner, and will complete RCC placement before the weather sets in. If we do not complete the RCC we would need to wait until the next season wear as Leveling concrete can be placed in more adverse weather conditions. This method also allows for BPLP to shift activates which were once linear to concurrent.