# Memorandum

*To:* *Bill Ruzzo, Interim General Manager*
*Chris Thorne, Counsel*

*From:* *Barbara Biggs, Program Manager*
*Steve Lowry, Deputy Program Manager*
*James Hinds, Deputy Environmental/Recreation Mitigation Task Lead*
*Tom Mercer, Project Engineer*

*Date:* *April 12, 2016*

*Subject:* *Chatfield Storage Reallocation Project – Refined Cost Estimate*

## INTRODUCTION

The Total Project Cost as defined in the Water Storage Agreement (WSA) is made up of the components shown in Table 1 below. The "original cost estimates" reflected in Table 1 are for near-term costs and the values are taken from the FR/EIS, FWRMP (122.2 Plan) and the WSA. The "refined costs" were developed by the design consultants for EM2, EM5, RM1 and RM2. The PgM reviewed unit costs and escalated the original cost estimates for EM3 and the Tree Management Plan.

The Water Storage Agreement (WSA) between the USACE and the State dated October 9, 2014, contains the following clause:

> XV.D: Within eighteen months after the effective date of this Agreement, the CDNR will reexamine and refine the total costs of the *Chatfield Storage Reallocation Project,* and give notice to the Government of such refined cost estimate in accordance with the notice provision of this Agreement. If the refined cost estimate exceeds one hundred and thirty four million dollars ($134,000,000) by ten percent or more, the CDNR shall have the right, for a period of 90 days after the day on which it gives notice to the Government, to terminate this Agreement.

CRMC Members are seeking the refinement of the Total Project Cost as the design progresses so that they can evaluate their continued participation in the Project at the dates given in the WSA and WPAs.

The cost estimates used in Project planning have been developed at different times by a variety of consultants during the development of the FR/EIS and the FWRMP. The PgM reviewed these prior cost estimates to identify changes since mid-2015. Now that preliminary design has commenced there is a better understanding of the actual work to be done. The designers provided their first updates in the form of an Opinion of Probable Cost (OPC) for each component on April 1, 2016. The PgM had developed a cost template for the designers to use. The template breaks out contingencies, allowances and other markups so that there is a consistent basis for comparing estimates over time. Additional refinements and updates will occur at the Preliminary Design Phase (to be completed in June 2016 for EM2, EM5, RM1 and RM2, and August 2016 for EM3) as well as at the Final Design Phase (to be completed in February 2017). As the design progresses, the contingencies in the Total Project Cost will decrease.

## DISCUSSION

In accordance with our scope of work, Phase IA.g, - Refine Cost Estimate, we have directed the preliminary design consultants contracted by the CRMC to provide refined cost estimates based on the best information available at this time. As the consultants were only issued notices to proceed in February, they have not progressed the designs significantly from the conceptual level designs in the FR/EIS. However, they have been able to identify some gaps, overlaps and adjustments to unit costs and quantities that do allow for a refinement of the Project cost estimate noted in the WSA. Also, the costs have been escalated to March 2016 using the Engineering News Record indices supplemented with current costs from vendors when available.

The designs are generally considered to be 15% complete. According to AACE International Guidelines , a 15% design is considered to be a Class 4 estimate that would typically have a variation from the final cost -15% to -30% in the low range and +20% to +50% in the high range. As the design progresses, the accuracy of the estimate will increase. This is shown graphically in Figure 1.

The PgM team has compiled the cost estimates received on April 1, 2016 from the consultants and has prepared the summary shown in Table 1. Following the table, comments and a more detailed breakdown of the cost estimates are provided for each component.

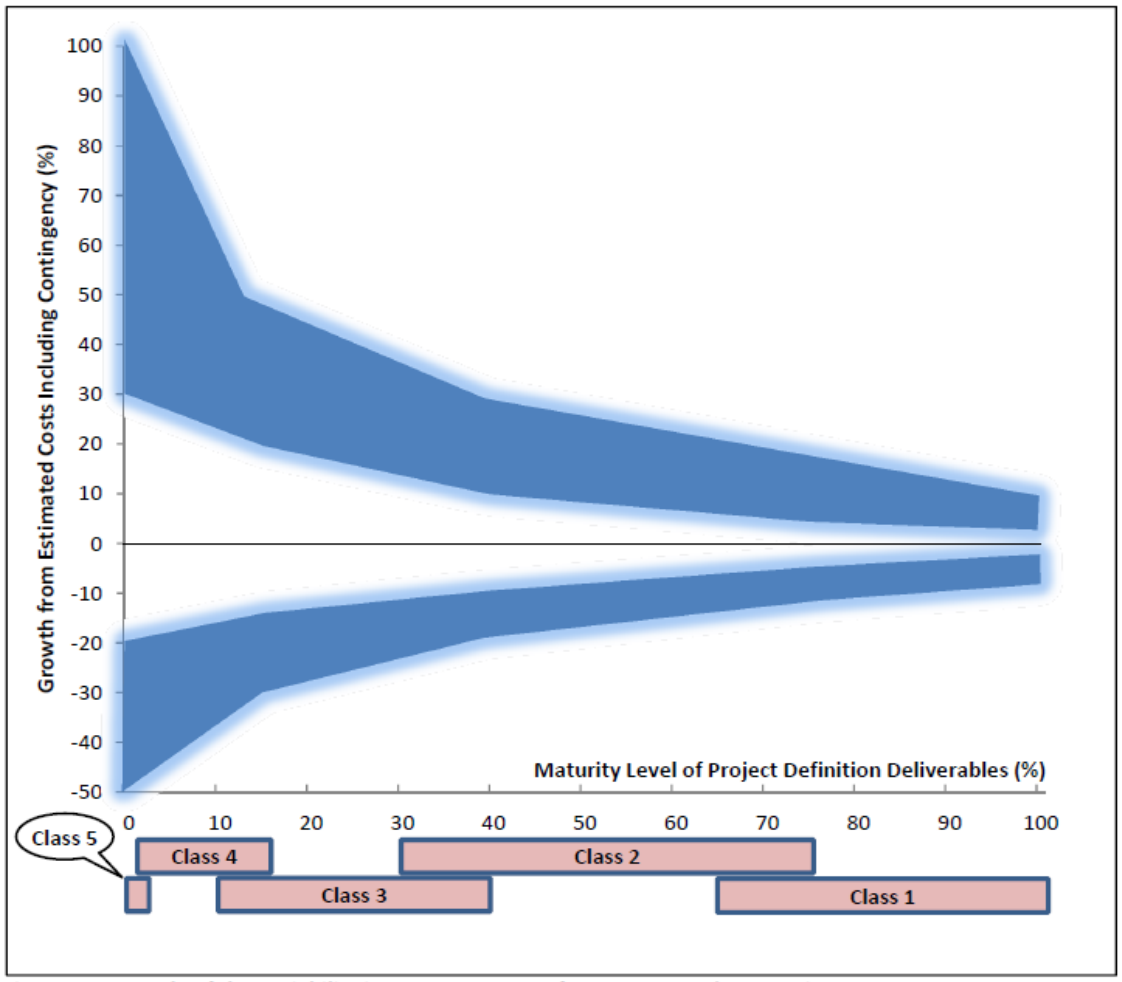


Figure 1 – Example of the Variability in Accuracy Ranges for a Process Industry Estimate

**Table 1. Comparison of Costs.**

| Item | Original Cost Estimates FR/EIS or 122.2 | Initial Refined Cost Estimates April 1, 2016 | Percentage Increase |
|---|---|---|---|
| Environmental Mitigation | $58,500,000 | $63,684,648 | 9% |
| Plum Creek Restoration Plan | $6,088,600 | $6,088,600 | 0% |
| Stream Enhancement Upstream | $369,600 | $369,600 | 0% |
| Stream Enhancement Downstream | $265,000 | $265,000 | 0% |
| Tree Management, App Z | $1,600,000 | $1,906,516 | 19% |
| **Sub-total:** | **$66,823,200** | **$72,314,364** | **8%** |
| Marina | $15,700,000 | $27,205,949 | 73% |
| Recreation Facilities Mitigation | $31,600,000 | $59,280,000 | 88% |
| Shoreline Stabilization Plan | $716,100 | $716,100 | 0% |
| WQ Modeling and Monitoring | $1,300,000 | $1,300,000 | 0% |
| Financial Plan (make up lost $) | $1,000,000 | $1,000,000 | 0% |
| Hiring of CPW Temp RE | $225,000 | $225,000 | 0% |
| Marketing PR Plan | $200,000 | $200,000 | 0% |
| Program Management | 4.5% | $5,290,394 | n/a |
| **Sub-total:** | **$115,964,300** | **$167,531,806** | 44% |
| First Cost of Storage | $16,285,392 | $16,285,392 | 0% |
| **Total Project Costs (OPC):** | **$133,849,692** | **$183,817,198** | **37%** |

## COMMENTS ON INDIVIDUAL PROJECTS INCLUDED IN TABLE 1

**Environmental Mitigation** (Contracts EM1, 2, 3, 5 and 6)

Table 2 includes the original cost estimates for environmental mitigation as estimated in the FR/EIS or included in the Fish, Wildlife and Recreation Mitigation Plan (FWRMP or 122.2 Plan).

**Table 2 Original Cost Estimates - FR/EIS and 122.2 Plan.**

| Project | Subtask | Original Cost Estimate | Notes |
|---|---|---|---|
| Environmental Mitigation | | $ 58,500,000 | ESTIMATED FR/EIS |
| | Plum Creek Restoration Plan | $ 6,088,600 | FIXED 122.2 |
| | Stream Enhancement Upstream | $ 369,600 | FIXED 122.2 |
| | Stream Enhancement Downstream (Dam to Marcy Gulch) | $ 265,000 | FIXED 122.2 |
| | Tree removal, App Z | $ 1,600,000 | ESTIMATED FR/EIS |
| **Environmental Total** | | **$ 66,823,200** | See Table 1 Row 6 |

Environmental mitigation includes the cost of the EM1 consultant, the costs from EM2- On-site Environmental Mitigation that are not covered in the 122.2 Plan components, the costs for EM3- Sugar Creek, the costs for EM5 – Off-site Environmental Mitigation, and the costs for EM6 – Off-Site Mitigation Appraisals. The initial refined cost estimates for these project elements are based upon the following.

The EM1 costs reflect the professional services of ERO, the consultant, and there is no construction cost involved.

The EM2 costs cover the on-site environmental mitigation, with focus on Plum Creek and the South Platte River areas. Part of the cost for the Plum Creek Restoration is addressed in the 122.2 Plan and is not included in the EM2 costs.

EM3 costs reflect escalation of the costs in the FR/EIS since the design has not progressed due to snow cover that has precluded survey and mapping of the area. The PgM did review the unit costs and quantities and did not find any issues of concern.

The EM5 costs are based on very preliminary investigations that focused on available land parcels with the potential to provide EFUs. The costs were developed in conjunction with the EM6 consultant, Mark S. Weston, who provided

input on costs associated with both obtaining conservation easements and purchasing land for preservation purposes.

Plum Creek Restoration Plan (Contract EM2)

As per the agreements in the 122.2 Plan, this is a fixed cost that covers design, construction and services during construction.

Stream Enhancement Upstream (Contract EM2)

As per the agreements in the 122.2 Plan, this is a fixed cost that covers design, construction and services during construction.

Stream Enhancement Downstream

As per the agreements in the 122.2 Plan, this is a fixed cost that covers design, construction and services during construction. Design and construction of stream enhancements downstream has been deferred pending final resolution of the financial commitment to the Park for lost revenues during construction.

Tree Management Plan, App Z (Contract EM2)

Appendix Z – Tree Management Plan of the FR/EIS was prepared prior to 2010 and the cost was estimated as $1,600,000 at that time. In Appendix Y – Project Implementation Costs, Table 2, the cost of tree management had been escalated to $1,710,975. The PgM has now escalated these costs to March 2016 for a current estimate of $1,906,516.

The Tree Management Plan set forth in Appendix Z to the FR/EIS was modified significantly in the 122.2 Plan to remove the requirement that the majority of trees below EL 5439 msl be cleared and grubbed. The modifications to the Tree Management Plan in the 122.2 Plan are expected to reduce the cost of tree management.

**Table 3 April 1, 2016 Initial Refinement of Environmental Mitigation Estimated Costs.**

| Project | Estimated Costs | Notes |
|---|---|---|
| EM1 (EFU) | $ 739,802 | |
| EM2 (Onsite Mitigation) | $ 22,471,971 | Includes additional costs (~$930k) for Plum Creek and S Platte River additional EFUs |
| EM3 (Sugar Creek) | $ 5,155,475 | No detailed information available to update unit costs, so previous costs escalated to March 2016 |
| EM4 (Suspended) | | |
| EM5 (Offsite Mitigation) | $ 35,261,400 | |
| EM6 (Appraisal and Valuation Services) | $ 56,000 | |
| **Subtotal** | **$ 63,684,648** | **$58,500,000 FR/EIS-122.2 Plan** |
| Plum Creek Restoration Plan | $ 6,088,600 | |
| Stream Enhancement Upstream (S Platte) | $ 369,600 | |
| Stream Enhancement Downstream (Dam to Marcy Gulch) | $ 265,000 | |
| Tree Removal, App Z | $ 1,906,516 | |
| **Environmental Mitigation Total** | **$ 72,314,364** | **$66,823,200 FR/EIS-122.2 Plan** |

**Recreation Facilities Modifications** (Contracts RM1 and 2)

Marina (Contract RM1)

SGJJR, the RM1 design consultant, considers this to be a 15% design.

The proposed design is based on providing like-kind facilities as defined by the CMCC. As shown in Table 4 below, the largest increases in the updated cost estimate were related to utilities (sewer lift station, force main and electrical updates to meet code), upland structures, and the new anchor system for the docks (marina facilities). The cut/fill quantities increased over earlier estimates due in part to accepting the like-kind criteria that is based on frequency of inundation. In the previous estimates SGJJR had omitted costs for contractor OH &P, these have now been included.

On the positive side, the possibility of moving the Marina to the southwest by approximately 200 feet will likely result in a reduction in cost. How much of a reduction is not known at this time.

SGJJR also has noted that the current costs do not include replacement of the 40-year old docks. The integrity of the docks to handle increased loading is still under investigation with results expected in the next two weeks.

Table 4 compares total line item costs for Marina facilities between the December 2015 Marina Report and SGJJR's April 1 cost estimate. Line item costs are the cost estimates for the elements of the project with no markups for the contractor, designer or services during construction. Opinion of Probable Construction Cost (OPCC) is the sum of the line item costs plus contractor markups. Opinion of Probable Cost is the line item costs with contractor markups and markups for design and services during construction.

**Table 4 Comparison of Marina Total Line Item Costs.**

| Item and Description | | April 1st 2016 Line Item Costs | December 2015 Line Item Costs | Difference | Percent Change |
|---|---|---|---|---|---|
| 1 | Demolition | $706,971 | $604,140 | $102,831 | 17% |
| 2 | Sitework | $7,662,893 | $9,189,361 | -$1,526,468 | -17% |
| 3 | Utilities | $1,262,771 | $486,200 | $776,571 | 160% |
| 4 | Upland Structures | $1,923,745 | $1,400,631 | $523,114 | 37% |
| 5 | Marina Facilities | $5,243,517 | $3,750,000 | $1,493,517 | 40% |
| **A** | **Total Line Item Costs** | **$16,799,897** | **$15,430,332** | **$1,369,565** | **9%** |

Table 5 is a summary of the OPC that includes all of the additional allowances that must be added to the direct costs to arrive at a total estimated cost for the Marina.

**Table 5 April 1, 2016 Marina Total Estimated Costs.**

| RM1 (Marina) | Estimated Costs | Notes |
|---|---|---|
| Total of Line Item Costs | $ 16,799,897 | **From Table 4** |
| Permits, Bonds & Insurance | $ 340,998 | |
| Subtotal of Construction Costs | $ 17,140,895 | |
| General Contractor Markups | $ 3,085,361 | |
| Total Construction Costs without Contingency | $ 20,226,256 | |
| Total Construction Costs with Contingency | $ 24,271,507 | |
| Engineering Design Services | $ 1,720,866 | |
| **Total Construction Costs with Contingency and Design Services** | **$ 25,992,373** | |
| **Services During Construction** | **$ 1,213,575** | |
| **RM1 Total Cost** | **$ 27,205,949** | **See Table 1 Row 7** |

Recreational Facilities Modifications (Contract RM2)

HDR, the design consultant for RM2, considers this to be between a 10% and 20% design.

As background to this item, the cost for all of the Recreational Facilities Modifications was reported to be $47.3M in the FR/EIS of July 2013, including an estimated cost for the Marina of $9.5M. Updated costs for the Marina of $15.7M were received in early 2015, but the total estimated cost for Recreation Facilities Modifications remained $47.3M. The 122.2 Plan includes updated cost estimates for the various elements of the recreation facilities modifications that reflects the increased cost estimate for the Marina and total $31.6M, but those estimates don't include any costs for borrow areas or trails. The PgM had previously identified $12.5M in costs for recreation mitigation that appeared to have been missed or included at an unrealistically low estimate in the FR/EIS and the 122.2 Plan.

The increases in the initial refined cost estimate are generally due to additional demolition, site work to meet like-kind functionality at some recreation facilities, trails, utilities and structures.

Examples of the increase in the cost of utilities include 4 new lift stations that were identified as needing to be replaced in the FR/EIS, but for which no costs were included, and the pipeline material necessary for relocation of the high-pressure gas line which is six time more costly than the FR/EIS estimate.

The increase in costs for the structures is related primarily to compliance with ADA, flood-proofing, building code and CPW standards. The cost increase for structures varies from an additional 40% up to 200%. The FR/EIS assumed all picnic shelters and information kiosks could be relocated and would not need to be replaced, however new construction is required since the existing structures cannot be relocated due to the nature of the existing structures (picnic shelters) or flood damage (kiosks).

The initial refined cost estimate for RM2 has been coordinated with EM2 so that gaps and overlaps have largely been eliminated. For instance, RM2 has included the cost of restoration or riparian habitat at several recreation areas, and this had been excluded from the EM2 estimates. One area of duplication that has been noted is tree removal. RM2 has included about $1.3M for tree removal/replacement, part of which should be counted under the Tree Management Plan.

Table 6 is a cost comparison of the line item costs for recreational facility modifications from the FR/EIS, to CDM Smith's revised Appendix M costs, and the cost estimates in the 122.2 Plan. It should be noted that both the FR/EIS and the 122.2 Plan did not include any costs for reclamation of the borrow areas and trails, and HDR did not include any costs for improvements to the small recreation area near the South Platte.

**Table 6 Comparison of RM2 Line Item Costs to Revised Appendix M and 122.2 Plan Costs.**

| Plan Area | RM2 Line Item Costs | Percentage of Total Cost | Revised Appendix M | Total Difference | Percent Difference | 122.2 Plan |
|---|---|---|---|---|---|---|
| North Boat Ramp | $3,236,455 | 10% | $783,550 | $2,452,905 | 313% | $1,220,183 |
| Massey Draw | $557,796 | 2% | $357,897 | $199,899 | 56% | $686,301 |
| Eagle Cove | $111,060 | 0% | $265,606 | -$154,546 | -58% | $426,589 |
| Deer Creek/Balloon Launch | $1,082,307 | 3% | $983,960 | $98,347 | 10% | $1,494,655 |
| Swim Beach | $5,850,866 | 18% | $6,379,804 | -$528,938 | -8% | $9,799,203 |
| Jamison | $1,972,470 | 6% | $1,416,402 | $556,068 | 39% | $1,917,629 |
| Catfish Flats | $2,590,221 | 8% | $1,370,427 | $1,219,794 | 89% | $1,731,060 |
| Fox Run | $1,351,994 | 4% | $207,800 | $1,144,194 | 551% | $307,955 |
| Kingfisher | $808,109 | 2% | $175,491 | $632,618 | 360% | $295,884 |
| Gravel Pond | $581,473 | 2% | $171,744 | $409,729 | 239% | $217,943 |
| Platte River | | 0% | $69,945 | -$69,945 | -100% | $112,337 |
| Roxborough Cove | $504,618 | 2% | $454,252 | $50,366 | 11% | $410,320 |
| Plum Creek | $1,274,584 | 4% | $424,442 | $850,142 | 200% | $479,351 |
| Roads and Bridges | $8,663,995 | 26% | $8,663,892 | $103 | 0% | $12,502,055 |
| Borrow Areas | $3,971,910 | 12% | $1,592,524 | $2,379,386 | 149% | N/A |
| Trails | $590,614 | 2% | | $590,614 | N/A | N/A |
| **Total Line Item Costs** | **$33,150,000** | | **$23,317,737** | **$9,832,263** | **42%** | **$31,600,000** |

Table 7 is a summary of the OPC for recreational facilities modifications that includes all of the additional allowances that must be added to the line item costs to arrive at a total estimated cost.

**Table 7 April 1, 2016 RM2 Estimated Costs.**

| RM2 (Rec Facilities) | Estimated Costs | Notes |
|---|---|---|
| Total of Line Item Costs | $ 33,150,000 | **See Table 6** |
| Permits, Bonds & Insurance | $ 770,000 | |
| Subtotal of Construction Costs | $ 33,920,000 | |
| General Contractor Markups | $ 6,230,000 | |
| Total Construction Costs without Contingency | $ 40,150,000 | |
| Total Construction Costs with Contingency | $ 48,100,000 | |
| Engineering Design Services | $ 6,300,000 | |
| **Total Construction Costs with Contingency and Design Services** | **$ 54,400,000** | |
| **Services During Construction** | **$ 4,880,000** | |
| **RM2 Total Cost** | **$ 59,280,000** | **See Table 1, Row 8** |

Shoreline Stabilization Plan (Contract RM2)

As per the agreements in the 122.2 Plan, this is a fixed cost that covers design, construction and services during construction. Construction of the shoreline stabilization will be deferred pending final resolution of the financial commitment to the Park for lost revenues during construction, but design is being completed under RM2.

**Other Costs** (FR/EIS, 122.2 Plan, WSA)

There are a number of other requirements that must be met under the FR/EIS, 122.2 Plan and WSA that are summarized below.

WQ Modeling and Monitoring (CRMC)

The cost was reviewed by the CRMC and was felt to be sufficient to cover the modeling and monitoring requirements. A RFP for the modeling work is expected to be issued in May 2016 and then the costs can be revisited.

Financial Plan (CRMC)

No additional information, so remains as is.

Hiring of CPW Temp RE (CPW)

No additional information, so remains as is. This position may be filled as early as the fall of 2016.

Marketing PR Plan (CRMC)

No additional information, so remains as is.

First Cost of Storage (WSA)

Per the WSA this is a fixed cost, so no escalation has been applied.

Program Management (CDMS)

In the FR/EIS the costs for PgM were distributed among the various components of the Project as part of the markups on the construction costs. Appendix M of the FR/EIS specifically identifies an Owner's Construction Phase Contingency equal to 5% of direct costs.

For the refined cost analysis, the markups of the construction cost have been adjusted so as not to include PgM, rather the PgM cost is applied at the end. The

figure shown represents 4.5% of the total estimated project cost (per the 122.2 plan, less first cost of storage). This is in accordance with our letter of July 3, 2015 that stated "our estimated cost through project completion is 4% to 5% of the total estimated project cost....."

Table 8 is a summary of the original cost estimates from the FR/EIS or 122.2 Plan for these additional requirements.

**Table 8 Original Estimates for Other Costs - FR/EIS and 122.2 Plan.**

| Project | Subtask | Fee | Notes |
|---|---|---|---|
| Other Costs | | | |
| | WQ Modeling and Monitoring | $ 1,300,000 | ESTIMATED FR/EIS |
| | Financial Plan (makeup lost $) | $ 1,000,000 | ESTIMATED 122.2 |
| | Hiring of CPW Temp RE | $ 225,000 | ESTIMATED 122.2 |
| | Marketing. PR plan | $ 200,000 | ESTIMATED FR/EIS |
| | Program Management | $ - | |
| **Total of Other Costs** | | **$ 2,725,000** | |
| | | | |
| **First Cost of Storage** | | **$ 16,285,392** | **FIXED** |

Table 9 summarizes the updated costs for these additional requirements. While these are estimated costs taken from the FR/EIS or the 122.2 Plan, no information is available to support any adjustment in these costs at this time. The cost for Program Management appears to be a new cost, but as explained above it was previously included in the construction costs for each of the mitigation projects and has been broken out to allow for more accurate accounting.

**Table 9 April 1, 2016 Update of Other Costs Identified in the FR/EIS.**

| Project | Estimated Costs | Notes |
|---|---|---|
| **Other Costs** | | |
| WQ Modeling and Monitoring | $ 1,300,000 | |
| Financial Plan (makeup lost $) | $ 1,000,000 | |
| Hiring of CPW Temp RE | $ 225,000 | |
| Marketing. PR plan | $ 200,000 | |
| Program Management | $ 5,290,394 | 4.5% of the 122.2 plan cost minus first cost of storage |
| **Total of Other Costs** | **$ 8,015,394** | |
| | | |
| **First Cost of Storage** | **$ 16,285,392** | |

## NEXT STEPS

The initial OPC refinements indicate the environmental mitigation is on track. Updated costs are within 8% of the original estimate, and opportunities in EM2 have been identified for additional on-site mitigation and EFU lift. As the preliminary design progresses, an estimate will need to be developed of the additional EFU lift available in EM2 from additional stream stabilization on Plum Creek and restoration on the South Platte, and a cost/benefit comparison with the off-site mitigation can be completed.

Clearly, additional focus is required to address the costs for RM1 and RM2. The PgM has already reached out to both design consultants and will be working to schedule workshops with each of them to go through a more complete evaluation of their cost estimates for each facility to be modified. Participation by CPW to further refine the requirement for "like-kind and in-kind functionality" is critical to reducing RM1 and RM2 costs.

As noted earlier in this memorandum, cost estimates at this level of design can vary from +50% to -30%; as the design progresses greater cost certainty will be achieved. Value engineering (VE) reviews of preliminary designs often achieve cost savings up to 30% range. Any future VE should focus on the recreation mitigation, and the CRMC may want to discuss the potential for including a VE analysis with the CMCC and Marina owners. The intent of a VE review of the Marina would not be to cut corners, but rather to identify ways to meet the like-kind functionality requirements more cost effectively.

## CONCLUSION

The refined cost estimate of $**183,817,198** is 37% over the $134M cost referenced in the WSA. Five general reasons for the increased cost have been identified:

1. **Escalation since the original estimates in the FR/EIS or 122.2 Plan** – many of these cost estimates are several years old and had to be escalated to March 2016. Future cost refinements will include escalation to mid-point of construction to provide a more accurate OPCC, although as the design progresses contingencies will be reduced.

2. **Previously Unidentified costs** – for example, neither the FR/EIS nor 122.2 Plan included estimated costs for reclamation of the borrow areas or trails. As shown in Table 6, current cost estimate for the borrow areas has increase from $1,592,524 to $3,971,910. Similarly, the FR/EIS included the need to relocate/replace four new wastewater lift stations, but no costs were included. CDM Smith estimates a cost of $200,000 for each lift station.

3. **Unrealistic cost estimates** – The FR/EIS included a unit cost of $60/sf for bridge replacement, but CDM Smith estimates a unit cost of $140/sf is more realistic. Similarly, the cost to relocate the high-pressure gas line is currently estimated to be six times the cost included in the FR/EIS due to required pipe material.

4. **Code Requirements** – the need to update structures for compliance with current requirements such as ADA, FEMA flood-proofing, building codes and CPW standards were not considered in the FR/EIS. Restroom and shower area square footage has increased by approximately 50% due to ADA and general equipment clearance requirements, compliance with FEMA requirements for floodable buildings, inclusion of energy efficiency standards, and compliance with CPW standards resulted in a 40% increase in cost for the swim beach buildings and a 200% increase at the vault and standard restrooms.

5. **In-Kind Facilities** – while the FR/EIS clearly anticipated Park facilities would be replaced in-kind, cost estimates for recreational facilities have been developed to provide similar functionality as existing facilities. For example, as shown in Table 6, costs have increased dramatically at facilities like Fox Run and Catfish Flats as a result of these requirements, in addition to code requirements for structures discussed in 4 above.

The PgM will work with the Interim General Manager and the RM1 and RM2 design consultants to more closely evaluate the cost estimates and identify areas where cost savings may be possible.

Attachment: standard cost template

cc: Ted Johnson, EM Task Leader
Brian Murphy, RM Task Leader

CHATFIELD STORAGE REALLOCATION PROJECT
COST TEMPLATE

| Client: CRMC<br>Project: Template<br>Level: Preliminary Design 30% | Opinion of Probable Cost of Construction<br>Chatfield Reallocation Project<br>Job No: 111561/111562 | | | Computed By:<br>Checked By:<br>ENR: 7,094 (March 2016) | |
|---|---|---|---|---|---|
| Item and Description | Quantity | Unit | Unit Cost | Extended Cost | Total Costs |
| **1 Demolition** | | | | | **$140,411** |
| Clear and Grub | 1 | AC | $2,500.00 | $2,500 | |
| Buildings & Group Shelters | 1 | LS | $70,000.00 | $70,000 | |
| Shade Canopy | 1 | EA | $10,000.00 | $10,000 | |
| Inspection Building | 1 | LS | $2,000.00 | $2,000 | |
| Wheel Stops | 1 | LS | $10.00 | $10 | |
| Roads & Parking | 1 | SF | $1.00 | $1 | |
| Misc. Pavements | 1 | LS | $37,100.00 | $37,100 | |
| Misc. Structures | 1 | LS | $18,800.00 | $18,800 | |
| **2 Sitework** | | | | | **$2,021,950** |
| Erosion Control | 1 | LS | $10,000 | $10,000 | |
| Cofferdam for Boat Launch | 1 | SF | $30 | $30 | |
| Excavation & Placement of Fill | 1 | LS | $1,106,250 | $1,106,250 | |
| Hauling | 1 | CY | $3 | $3 | |
| Dredging | 1 | CY | $25 | $25 | |
| Sheetpile Wall - Submerged | 1 | VSF | $55 | $55 | |
| Stacked Shoreline Wall | 1 | VSF | $30 | $30 | |
| Topsoil - strip, stockpile and respread | 1 | CY | $3 | $3 | |
| Revetments | 1 | SY | $50 | $50 | |
| Fine Grading | 1 | SF | $0 | $0 | |
| Parking & Roads | 1 | LS | $688,000 | $688,000 | |
| Pavement Marking | 1 | LS | $15,000 | $15,000 | |
| Trails | 1 | SF | $5 | $5 | |
| Launch Ramp & Courtesy Dock | 1 | LS | $202,500 | $202,500 | |
| **3 Utilities** | | | | | **$486,200** |
| Water Service | 1 | LS | $14,500 | $14,500 | |
| Sanitary Laterals & Manholes | 1 | LS | $80,000 | $80,000 | |
| Sanitary Lift Station | 1 | LS | $250,000 | $250,000 | |
| Sanitary Lift Station | 1 | LS | $66,500 | $66,500 | |
| Electrical System | 1 | LS | $75,200 | $75,200 | |
| **4 Upland Structures** | | | | | **$1,307,485** |
| Picnic / Day Use Shelters | 1 | EA | $93,146 | $93,146 | |
| Volleyball & Horseshoe Pits | 1 | LS | $30,000 | $30,000 | |
| Site Furnishings | 1 | LS | $6,750 | $6,750 | |
| Irrigation | 1 | LS | $42,750 | $42,750 | |
| Landscaping | 1 | LS | $234,089 | $234,089 | |
| Restroom and Shower Building | 1 | LS | $400,000 | $400,000 | |
| Fishing Pier | 1 | LS | $225,000 | $225,000 | |
| Portable Restroom Relocation | 1 | LS | $750 | $750 | |
| Restroom Building | 1 | LS | $275,000 | $275,000 | |
| **5 Marina Facilities** | | | | | **$990,120** |
| Gangways to dockage | 1 | LS | $215,000 | $215,000 | |
| Floating Wave Attenautor | 1 | SF | $120 | $120 | |

CHATFIELD STORAGE REALLOCATION PROJECT
COST TEMPLATE

| | Client: CRMC<br>Project: Template<br>Level: Preliminary Design 30% | Opinion of Probable Cost of Construction<br>Chatfield Reallocation Project<br>Job No: 111561/111562 | | | Computed By:<br>Checked By:<br>ENR: 7,094 (March 2016) | |
|---|---|---|---|---|---|---|
| | **Item and Description** | **Quantity** | **Unit** | **Unit Cost** | **Extended Cost** | **Total Costs** |
| | Anchorage | 1 | LS | $650,000 | $650,000 | |
| | Dock Adjustments | 1 | LS | $125,000 | $125,000 | |
| **A** | **TOTAL LINE ITEM COSTS** | | | | | **$4,946,166** |
| **B** | **Permits, Bonds & Insurance** | | | | | **$103,923** |
| | Construction Permits | | | | $5,000 | |
| | GC Bond (1%) | 1% | | | $49,462 | |
| | GC Insurance (1%) | 1% | | | $49,462 | |
| **B** | **TOTAL CONSTRUCTION COSTS (OPCC)** | | | | | **$5,050,089** |
| **C** | **General Contractor Markups** | | | | | **$909,016** |
| | General Conditions (8% - 10%) | 8% | | | $404,007 | |
| | Overhead & Profit (10%) | 10% | | | $505,009 | |
| **C** | **Total Construction Costs without Contingency** | | | | | **$5,959,105** |
| **D** | **Construction Contingency (10% to 30%)** | 15% | | | $893,866 | **$893,866** |
| **D** | **Total Construction Costs with Contingency** | | | | | **$6,852,971** |
| **E** | **Engineering Design Services** | | | | | **$1,192,588** |
| | Preliminary Design Services | | | | $507,291 | |
| | Preliminary Design Services - Contingency | 0% | | | $0 | |
| | Final Design & Bidding Services (10% - 15%) | 10% | | | $685,297 | |
| **E** | **Total Construction Costs with Contingency and Design** | | | | | **$8,045,559** |
| **E** | **Services During Construction (8% - 12%)** | 10% | | | $685,297 | **$685,297** |
| **E** | **TOTAL ESTIMATED PROJECT COSTS (OPC)** | | | | | **$8,730,857** |