

MEMORANDUM

TO: Board of Trustees

THROUGH: Mike Bandelin, Interim General Manager
Kate Nelson, Engineering Manager

FROM: Hudson Klein, Principal Engineer

SUBJECT: Report to the Board on the Opinion of Probable Construction Cost for GMP2 and the total project cost of the Export Effluent Pipeline Project (CIP #2524SS1010)

RELATED STRATEGIC PLAN BUDGET INITIATIVE(S): **LONG RANGE PRINCIPLE #5 – ASSETS AND INFRASTRUCTURE**

The District will practice perpetual asset renewal, replacement and improvement to provide safe and superior long term utility services and recreation venues, facilities, and services.
Budgeted Initiatives D - Allocate capital expenditures to maintain services and facilities.

RELATED DISTRICT POLICIES, PRACTICES, RESOLUTIONS OR ORDINANCES Board Policies 12.1.0 Multi-year Capital Planning; 13.2.0 Capital Planning Capital Expenditures; 21.1.0 Purchasing Policy for Public Works Contracts

DATE: August 30, 2023

I. RECOMMENDATION

None at this time - report item only.

II. BACKGROUND

On April 12, 2023, the first phase of the export effluent pipeline was awarded to Granite Construction as the construction manager at risk (CMAR). The initial guaranteed maximum price (GMP1) was prepared in accordance with NRS Section 338.1696 and is comprised of approximately 5,365 linear feet (LF) of pipeline. GMP1 was awarded to Granite for \$10,831,500 and includes approximately \$1.5M in risk reserve. This cost is inclusive of the competitive bidding process completed by Granite in preparation of GMP1 and represents the current material, construction, and formal subcontractor project bids. The first year costs total approximately \$14M inclusive of GMP1, contingency, IVGID

purchased pipe materials, design and administration, and inspection/management costs.

The 90% opinion of probable construction cost (OPCC) and resulting total program cost was presented to the Board of Trustees on January 11, 2023 and was estimated at approximately \$58,730,000. The 90% OPCC was prepared by the CMAR and the independent cost estimator (ICE) and the estimated costs were within 1% of each other (Attachment A). The actual costs of GMP1 did not support the overall program cost that was presented at the January Board meeting and the Board requested Staff present an updated estimate for the remainder of the effluent pipeline project at the May 25, 2023 meeting. Although the item was removed from the May 25, 2023 agenda due to prioritization of other items, an total program cost of \$71.6M was prepared based on the latest information at that time. Since the start of May, approximately 3,300LF of new pipeline has been installed with 2,300LF currently in operation.

The current total project cost is approximately \$64.1M. This is an increase to the total cost presented at the January 2023 Board meeting of approximately \$5.4M. A comparison of total project costs are shown in the table below:

	January 2023 90% Total Project Cost	May 2023 Total Project Cost	July 2023 Total Project Cost	Difference (January to July 2023)
Construction Costs (incl CMAR fee & pipe purchase)	\$46,000,000	56,300,000	\$50,230,000	\$4,230,000
Risk Reserve	\$10,300,000	9,200,000	\$8,950,000	- \$1,350,000
Contract Contingency & Administration Fees	\$2,400,000	6,100,000	\$4,920,000	\$2,520,000
Total	\$58,730,000	71,600,000	\$64,100,000	\$5,370,000

Construction Cost Increase:

Several factors influenced the increase in (direct) construction costs. Substantial changes resulted from:

- Shifting the estimated cost escalations (inflation allowance) from the risk reserve into the direct costs; several risk items were reallocated from the risk reserve into direct costs and additional industry escalations have been included since January 2023.

- Design and construction scope changes from 90% design to construction issue; this includes design aspect quantity increases, and construction methodology refinements.
- Additional traffic control and utilization of a DBE for SRF funding criteria; this assumes multiple, coincident work fronts in 2024 and 2026 and increased equipment required to support each set-up.

Risk Reserve Movement:

Several factors influenced the movement in risk reserve costs. Substantial changes resulted from:

- The overall decrease in risk reserve is representative of the transfer of cost escalations from the risk reserve into the direct construction costs.
- A \$0.6M increase was included to allow for potential change-order mark-ups to be applied to any realized risk items; this was not previously included in the 90% OPCC Risk Register.
- An increased allowance for anticipated hard rock excavation resulting in decreased productivity and requiring additional rock-breaking equipment/subcontractors (+\$1.5M).
- NDOT will be completing improvements to SR50 and will occupy the GMP1 staging areas for their own project in 2024 and 2025. The likely loss of NDOT staging areas at SR50/SR28 will increase construction costs as it requires the contractor to travel further for every truck trip.

The final risk reserve will be further negotiated during formal GMP2 reconciliation efforts. The 90% OPCC, GMP1 and GMP2 OPCC risk registers are included in Attachment B.

Administration and Inspection Fees Increase:

The January 2023 OPCC indicated construction-phase cost estimates only and did not include design-phase consultant, IVGID Staff-management, and regulatory permitting costs (+\$1M); this has been included in the current total project estimate added to the CMAR OPCC.

The total project increase for administration is also the result of several contributing factors: actual testing & inspection contract costs versus assumed fees; contingencies (currently at 1.25% of construction cost) for the contracts based on increased direct costs. Each design, permitting, project management, and inspection item in the GMP2 OPCC submitted with the memo is based on billed time and lessons learned through two months of construction completed to date.

III. BID RESULTS

There are no bid results as part of this GMP2 OPCC and total project cost estimate. The competitive bidding process and resultant project unit rates

completed by the CMAR during the preparation of GMP1 were used in preparation of the GMP2 OPCC.

IV. FINANCIAL IMPACT AND BUDGET

The current total project cost estimate of \$64.1M represents an increase of approximately \$5.4M from the OPCC presented in January 2023.

Funding currently available for the project is \$52.74M in SRF Loan Funds, \$1.6M in EPA Clean Water SRF Program Funds, and \$15.463M in Utility Funds, totaling \$69.803M.

Staff continues to pursue Section 595 grant funding with the United States Army Corps of Engineers (USACE) for GMP2. Staff is currently in discussions with USACE for an amendment to the existing Project Partnership Agreement (PPA) for Effluent Pipeline project funding (Increment 2). In addition, Nevada Senate Delegation has included a \$15M request for the Effluent Pipeline project in their FY2024 Congressionally Directed Spending Requests. NOTE: The funds have not been awarded and are not included in the \$69.803M figure listed above.

V. ALTERNATIVES

There are no alternatives; the total project cost and GMP2 OPCC has been prepared for information and discussion purposes.

VI. COMMENTS

GMP1 includes time and resource allowances for on-site investigations (potholing and inspections) to better inform the actual GMP2 scope and cost profile; Staff and Granite personnel are planning further investigations to increase confidence in the construction schedule and cost estimates for GMP2. Staff is currently working with Granite to refine the cost proposal for GMP2 (remainder of the Phase 2 Effluent Export Pipeline project). Cost reductions from the May 2023 to the July 2023 OPCC presentations result from means and methodology changes following lessons learned during the initial phases of GMP1 pipeline installation.

The intent is to bring a contract before the Board for their consideration in early Fall 2023. However, this date could change depending on the status of USACE 595 Program Funds. This is due to the requirement in the PPA for the USACE to provide written confirmation that the (USACE required) environmental compliance has been completed for an increment of work prior to issuing solicitation for the first construction contract.

VII. BUSINESS IMPACT/BENEFIT

This item is not a "rule" within the meaning of Nevada Revised Statutes, Chapter 237, and does not require a Business Impact Statement.

VIII. ATTACHMENTS

1. ATTACHMENT A - 90% OPCC_CMAR ICE_Dec2022

2. ATTACHMENT B - 90% & May 2023 & July 2023 Risk Registers_082523

IX. **DECISION POINTS NEEDED FROM THE BOARD OF TRUSTEES**

Basis of Estimate

IVGID Effluent Pipeline Replacement - Segment 2 - Specifications

IVGID Effluent Pipeline Replacement - Segment 2 - Revised Drawing Set Dated 11/21/22

IVGID Pipeline 90% OPCC Assumptions - Granite

100% OPCC development - Pipeline material change

- Email correspondence via Raquel Floyd stating, "...to proceed with substitution of PC350 DIP for all the HDPE sections for development of the OPCC."

Reconciliation meeting that took place 12/5/22 amongst all three parties. Estimate to reflect.

Exclusions and Assumptions

We have carried the following below line percentage markups;

General Conditions	LS
Construction Contingency	10.0%
Design Contingency	8.0%
Bond	1.0%
GL Insurance	2.5%
Design Build Fee	0.0%
Permits	1.2%
Fee	14.0%
Escalation	16.1%

General

- The following estimate is priced as a union job/prevaling wage. This estimate is to reflect the revised drawing set dated 11/21/22.
- The estimate is to reflect item revisions discussed at the the reconciliation meeting that took place on 11/21/22. Parties present were client 'Rock Solid Solutions', owner representatives, and the general contractor.
- As instructed by client 'Rock Solid Solutions', we carry similar assumptions as the contractor (Granite) for comparative purposes.
- Though we feel the contractor's daily work production is ambitious, we have been instructed by the client to carry similar working days assumptions with the general contractor (Granite). This estimate has been adjusted for work to be performed 24 hours per day, five days per week, Sunday night through Friday noon; during the months of May 1st through October 15th for a total of 5-1/2 months or approximately 23 weeks. Note that TRPA will have to approve work on Sunday's according to the documents.*
- Considering the above, we highly recommend potholing efforts in an effort to avoid as many unforeseen issues as possible and help in meeting the four season construction schedule.
- All new piping to be installed in a parallel alignment to the existing pipeline in the middle of both wheel tracks of the southbound lane of SR-28.
- Escalation has been carried at the following percentages to meet current market escalation rates: 10% for 2022, 6% for 2023, and 5% for years 2024-2026.

- 8 Some unit rates were based on the assumption that crews have limited access and egress given the location of the proposed sewer line. Therefore, some crew production rates have been adjusted to factor average to slower productivity.
- 9 Per last reconciliation meeting 11/21/22, Granite and IVGID stated 70% of the trench will be under 5 foot, we have carried that assumption in our estimate.

Bid Item Assumptions & Clarifications

- 10 We have assumed surveying will be a split cost between the owner and contractor; Owner to hire surveyor for initial control and benchmark, and contractor to hire for daily staking, our estimate to reflect.
- 12 Per CM's assumptions, we have carried cost to remove 300 LF of asbestos contaminated pipe.
- 13 Per CM's assumptions, we have carried an allowance to drain any trapped effluent waste, and to reintroduce to the effluent pipeline flowing towards Carson Valley.
- 14 Pipe unit cost rates to reflect demolition and disposal of pavement, excavation, hauling/trucking disposal of initial backfill zone only, shoring and trench protection, 4" bedding material at base of pipe, pipe lay and weld, pipe pressure testing, backfill and compaction both screened native soils (intermediate zone), new import soils (initial fill zone), 12" aggregate base below pavement, and 8" bituminous pavement. Sawcutting is captured as a separate line item to reflect CM format (see estimate breakout).
- 15 Per client communication, the 6" lean concrete cover to go over the proposed utility has been deleted by owner. We have assumed additional backfill quantities in lieu of deleted scope.
- 16 Repaving trench areas are to include both initial patching of 8 inch full-depth, as well as asphalt overlay (2 inch grind and overlay).
- 17 Traffic control includes 22 months to complete the project, and assumes single lane flagger controlled closure, 24 hours per day, Sunday night at 8 PM through the following Friday afternoon.
- 18 3 inch air/vacuum assembly has been priced to reflect new construction and not to modify existing, see details within drawing G007 of the 'Effluent Pipeline CMAR Project Segment 2 - 100% Design' drawing set.
- 19 Blowoff valve assembly has been priced to reflect new construction and not to modify existing, see details within drawing G007 of the 'Effluent Pipeline CMAR Project Segment 2 - 100% Design' drawing set.

Exclusions

- 20 As instructed by client 'Rock Solid Solutions', we have carried similar exclusions as stated in 'IVGID Pipeline 90% OPCC Assumptions - Granite' construction document.



January 2023 Risk Register

12/6/2022

DRAFT IVGID Effluent Export Pipeline CMAR CONSTRUCTION 90% - Risk Register							Quantitative Analysis				Comments
No.	Functional Assignment	Status	Description Of Risk	Mitigation Strategy	Type of Risk	Probability	Cost Impacts (\$)		Schedule Impacts (Working Days)		
							Cost (\$)	Estimated Risk Amount	Time Impact	Estimated Time Impact	
1	Design	Open	Frequency and method of pressure testing - Welded Steel / DIP (Would precast square vaults be beneficial for presure testing operations?)	- Develop Testing Procedure and Plan, details of testing connections. - Consult outside testing firms (MilBar) for recommended testing procedures and pressures. - Consult pipe manufacturers for recommended testing procedures - Conduct task force meeting, establish procedure, place in DIRECT COSTS	Cost & Schedule	25%	\$ 1,064,000.00	\$ 266,000.00	23	5.75	Scope gap potential due to specification development and owner requirements (i.e. pressure testing against valves, segment lengths, and exposed joints). Pipe manufacturers have expressed concerns over the testing pressures exceeding their rated pipe pressures.
2	Design	Open	Impact to production based on frequency and method of weld testing - Steel pipe (X-ray)	Develop Testing Procedure and Plan Frequency of Xray inspection to be determined and Impact	Cost & Schedule	50%	\$ 851,400.00	\$ 425,700.00	33	16.5	Assumed to be Owner provided third party QA inspection. Approximately 167 joints to inspect @ 2 hours per each = 334 hours
3	Design	Open	New pipeline alignment conflicts with existing improvements	GPR, Pothole, Design out, survey existing conditions, purchase additional fittings	Cost & Schedule	25%	\$ 1,816,860.00	\$ 454,215.00	20	5	Conflict with existing pipeline alignment creating additional crossings or tie-in connection points Encounter unknown culvert crossings or other utilities (Guardrail, Concrete Curb & Gutter, AC Curb Removal and Replacement)
4	Design	Open	GC 90% Design Plans do not specify number of Fittings & Degree of Angle per fitting.	Fittings adequately detailed on plan sheets, Have Additional Fittings On Hand Have Pipe Manufacturer (US Pipe) engineer lay sheets (mark sheets) to clarify materials purchase	Cost	8%	\$ 342,000.00	\$ 27,360.00	0	0	72 each x \$4,750 per each (fitting & multi-bead closure)
5	Design	Open	NDOT Eliminate new pipeline joints at NDOT culvert crossings	Purchase additional pipe to make adjustments to joint locations (i.e. Multi-bead sections of pipe) Have Pipe Manufacturer (US Pipe) engineer lay sheets (mark sheets) to clarify materials purchase Decrease as GMP's are released and acutal pipe purchases are made	Cost	100%	\$ 246,240.00	\$ 246,240.00	5	5	Could occur at each crossing. Total of 38 crossings 38 sticks x 2 each x 18 LF = 1,368 LF x \$180 2 hours per joint adjustment
6	Enviornmental	Open	IVGID Existing pipe discharge due to break or pipe failure (flooded trench, enviro release, etc)	Emergency Response Plan, Repair parts on hand (in-stock) at local supply, etc. GC to make repairs and coordinate with IVGID operations throughout construction	Cost & Schedule	25%	\$ 1,016,000.00	\$ 254,000.00	20	5	Assume crew cost = \$25,000/day Traffic Control = \$7,800/day x 1 week x 4 seasons GCs = \$18k x 1 week x 4 seasons
7	Excavation	Open	GC Encounter hard rock that needs to be excavated	- Improved quantification of known hard rock locations (to idendify LF of trench) via GPR intel, followed up with pre-work package to include potholing (conventional or track-drilling). - Estimate includes Hammer Hoe attachment for nuisance rock - Rock-splitting to remove rock. - Correlate HDR PDR (June 2012) Rock excavation limits to current plan set	Cost & Schedule	50%	\$ 2,874,700.00	\$ 1,437,350.00	89	44.5	East Shore Trail = \$1.2 Million 30% of alignment = 8,900 LF 100 LF per day = 89 days x \$6,500/day Traffic Control = \$7,800/day x 89 days GCs = \$18k x 89 days

Cost (\$) is currently included in the 90% OPCC. The estimated Risk Amount is added cost based on probality of extra testing being required.

Could occur at each crossing. Total of 38 crossings
38 sticks x 2 each x 18 LF = 1,368 LF x \$180
2 hours per joint adjustment

January 2023 Risk Register

8	Excavation	Open	GC	Undermining or Overexcavation due to overbreak of Trench due to encountering unsuitable materials creates increased materials quantities required for trench backfill, and patching.	As needed	Cost	10%	\$ 3,362,500.00	\$ 336,250.00	5	0.5	Use established unit prices to establish Risk \$\$ 25% of excavated volume = 6,725 CY (excavation, hauling & disposal, backfill with screened native).
9	Excavation	Open	GC	If ground water (in excess of nuisance) is encountered in low lying areas, we will need to de-watering, treat and dispose of properly	Proper Permits & Dewatering Equip, coordinate with local agencies	Cost & Schedule	25%	\$ 50,000.00	\$ 12,500.00	4	1	Account for 500LF of overall pipeline length (near Bliss, Secret Creek, and Skunk Harbor) 500 LF = 1 months rent (de-watering system) x \$50,000 per month
10	Excavation	Open		Procuring de-watering tanker trucks during construction season for removal of residual water in Dormant pipeline sections	Advanced scheduling	Cost & Schedule	25%	\$ 512,000.00	\$ 128,000.00	20	5	Waters, Hero, EPS, Clean Harbors
11	Excavation	Open	IVGID	Trench alignment crosses centerline (into live lane)	Design out	Cost & Schedule			\$ -	0	0	Believe this has been accounted for in current 90% parallel alignment
12	Materials	Open	GC	Delay start of construction due to availability of materials, weather delay, funding, permitting.	Identify & Order Early/Separate GMP	Cost & Schedule	25%	\$ 125,000.00	\$ 31,250.00	22	5.5	Delay start of a single season by 1 month causing an additional 5th season. Mob, Rent, Permits = \$125k
13	Materials	Open	GC	Escalations (Labor, materials, fuel (currently, to be broken out separately into individual items).	Order Early/Separate GMPs/Identify Stockpile storage location options At for Construction Design, GC includes Labor and Equipment (less fuel) escalations. Materials escalations to remain as Risk	Cost	75%	\$ 4,660,000.00	\$ 3,495,000.00	0	0	5% year over year
14	Materials	Open	GC	Fuel Escalations	Owner Allowance item Develop indexing metric	Cost	100%		\$ -	0	0	TBD. Currently accounted for in above Escalations item.
15	Materials	Open	GC	5% additional Waste on Ductile Iron Pipe Purchase	Fittings adequately detailed on plan sheets, Have Additional Fittings On Hand Deliver 100% Design Plans to Pipe Manufacturers - develop expected waste factors	Cost	0%	\$ 240,741.00	\$ -	0	0	24,707 LF x .05 = 1,235 LF @ \$180 / LF = \$222,363 x 1.08265 = \$240,741 Moved \$120k to Item #5
16	Materials	Open	GC	7% Pipe Escalations (Beginning in 2023)	Order Early/Separate GMP/Identify Stockpile storage location options Remove this amount from above 5% escalations	Cost	100%	\$ 221,086.00	\$ 221,086.00	0	0	24,707 LF - 8,500 = 16,207 @ \$12.60 / LF = \$204,208 x 1.08265 = \$221,086
17	Materials	Open	GC	Encounter unsuitable material during screening native material for Intermediate Backfill. Cost to offhaul and import new material		Cost	25%	\$ 332,150.00	\$ 83,037.50	0	0	Intermediate Backfill = 5,643 CY x \$50/CY Buy/Haul added allowance for offhaul / disposal of unsuitable material = \$50k
18	NDOT	Closed		Parking 30' from E.O.P. or required use of K-rail	Identify potential pullouts / cost Temp Rail	Cost	0%	\$ -	\$ -	0	0	Included in 90% OPCC
19	NDOT	Open		Conflict with Adjacent Q&D/NDOT project	Coordinate with Q&D / NDOT	Cost & Schedule	0%		\$ -	0	0	Included in 90% OPCC
20	NDOT	Open		Upon excavating for new pipeline to cross under existing CMP culvert, we determine the condition of existing culverts not satisfactory (i.e. Corrosion). What method of repair would NDOT require?	Coordinate with NDOT. Potential slip-lining. NDOT or IVGID issue? NDOT evaluation report upcoming (clarifying conditions of existing culverts). Verifying the NDOT provided condition assessment report is accurate. Develop strategy for repair & compensation	Cost & Schedule	20%	\$ 665,000.00	\$ 133,000.00	1	0.2	38 crossings x 50 LF/Each = 1,900 LF
21	NDOT	Open	GC	Can we use existing culvert to host NEW fiber optic utilities?	VEP Opportunity?				\$ -		0	
21	NDOT	Open		Full closure of Hwy 28 during shoulder season	VEP Opportunity?	Cost & Schedule	0%	\$ (3,000,000.00)	\$ -		0	Plugged assumed opportunity cost. (Double productions, reduced TC, reduced per week patching required, Open-Grade efficiencies)

January 2023 Risk Register

22	NDOT	Open		NDOT right-of-way staging areas available for project use at time of construction?	Use IVGID property or other location outside of basin (i.e. bottom of US 50)	Cost	25%	\$ 7,317,634.00	\$ 1,829,408.50		0	Potential to double trucking cost. One season of not having access to yards. ***Analysis in progress***
23	NDOT	Open		NDOT needing to perform maintenance on some existing culverts (Bliss Creek)	NDOT to perform culvert cleaning??	Schedule			\$ -		0	Unknown risk. More details needed
24	Public	Open	IVGID	Emergency reposnse - Wildfire / Traffic accident	Emergency Response Plan	Cost & Schedule	25%	\$ 1,584,000.00	\$ 396,000.00	88	22	
25	Public	Open		Added requirement to modify traffic control plan/system	Add Pilot Car	Cost	10%	\$ 1,234,066.00	\$ 123,406.60		0	Pilot Car: 4 Seasons
26	Quality	Open	IVGID	Failed pressure test and leak detected in new pipeline	Develop Testing Procedure and Plan	Cost & Schedule	25%	\$ 520,500.00	\$ 130,125.00	10	2.5	1% of overall pipe length = 300 LF x \$875/LF
27	Stakeholders	Open	GC	Unforeseen Special Events (Races & Marathons)	Consult Stakeholders Early & Often	Cost & Schedule	25%	\$ 516,000.00	\$ 129,000.00	20	5	4 Seasons X 5 Days = 20 Days
28	Weather	Open	GC	Weather (Thunderstorms / Freak Rain Events / Average Rainfall)	Account for additional days in CPM Schedule	Cost & Schedule	25%	\$ 516,000.00	\$ 129,000.00	20	5	5 Days/Season accounted for in CPM. Additional 5 Days/Season
29	Stakeholders			Unforeseen TRPA required remediation measures at staging yards		Cost	25%	\$ 100,000.00	\$ 25,000.00	0	0	
30	Design			Clarification of Cathodic protection system (locations, offsets, and depths of anodes)	Design detail clarification	Cost	0%	\$ (350,000.00)	\$ -			
31	Weather	Open	GC	Construction Water Purchase		Cost	0%	\$ -	\$ -	0	0	0
Totals									\$ 10,312,928.60	128.45		



May 2023 GMP2 Risk Register

DRAFT Risk Register Breakdown of Estimated Costs					Quantitative Analysis				Comments	
					Cost Impacts (\$)		Schedule Impacts (Working Days)			
Item	Description Of Risk	Mitigation Strategy	Type of Risk	Probability	Cost (\$)	Estimated Risk Amount	Time Impact	Estimated Time Impact	Original Comments	Additional Comments (Remaining Scope)
2	Impact to production based on frequency and method of weld testing - Steel pipe (X-ray)	Develop Testing Procedure and Plan Frequency of Xray inspection to be determined and Impact	Cost & Schedule	50%	\$ 851,400.00	\$ 425,700.00	33	16.5	Assumed to be Owner provided third party QA inspection. Approximately 167 joints to inspect @ 2 hours per each = 334 hours	
3	New pipeline alignment conflicts with existing improvements (needs to include existing pipeline crossing alignment of new pipeline for future GMPs)	GPR, Pothole, Design out, survey existing conditions, purchase additional fittings	Cost & Schedule	25%	\$ 1,816,860.00	\$ 454,215.00	20	5	Conflict with existing pipeline alignment creating additional crossings or tie-in connection points Encounter unknown culvert crossings or other utilities (Guardrail, Concrete Curb & Gutter, AC Curb Removal and Replacement) 5% of overall length = 1,485 LF x \$876/LF	
6	Existing pipe discharge due to break or pipe failure (flooded trench, enviro release, etc) - outside of GC negligence	Emergency Response Plan, Repair parts on hand (in-stock) at local supply, etc. GC to make repairs and coordinate with IVGID operations throughout construction	Cost & Schedule	33%	\$ 1,016,000.00	\$ 335,280.00	20	6.6		GMP 1 x 3 seasons

May 2023 GMP2 Risk Register

7	<p>Encounter hard rock that needs to be excavated in excess of what is included in budget which triggers T&M tracking and payment over 8-hours of hydraulic hammering at a given location. Anticipated hard rock that may trigger this could include bedrock and/or large non-excavatable boulders.</p> <p>One trigger would be in excess of 8 hours of hammering per week that affects the pipe crew's production.</p> <p>Another would be if production begins to be affected when the lay crew catches up to the hammer hoe and is unable to install additional pipe.</p> <p>Pipe crew is considered labor, equipment, hauling, and subcontractors necessary to complete typical pipe installation.</p>	<p>- Improved quantification of known hard rock locations (to identify LF of trench) via GPR intel, followed up with pre-work package to include potholing (conventional or track-drilling).</p> <p>- Estimate includes Hammer Hoe attachment for nuisance rock</p> <p>- Rock-splitting to remove rock.</p> <p>- Correlate HDR PDR (June 2012) Rock excavation limits to current plan set</p>	Cost & Schedule	33%	\$ 8,826,560.00	\$ 2,912,764.80	89	29.37	East Shore Trail = \$1.2 Million
9	<p>This is risk associated with ground water in excess of what GC can pump with a 2" sump pump and discharge onsite (Granite is considering this nuisance water). This will be triggered if Granite needs to upsize the pump, treat the water that is in the work zone, and/or offhaul water in water trucks.</p>	Proper Permits & Dewatering Equip, coordinate with local agencies	Cost & Schedule	25%	\$ 50,000.00	\$ 12,500.00	4	1	Account for 500LF of overall pipeline length (near Bliss, Secret Creek, and Skunk Harbor) 500 LF = 1 months rent (de-watering system) x \$50,000 per month
12	<p>Delay start of construction due to availability of materials, weather delay, funding, permitting.</p>	Identify & Order Early/Separate GMP	Cost & Schedule	33%	\$ 125,000.00	\$ 41,250.00	22	7.26	Delay start of a single season by 1 month causing an additional 5th season. Mob, Rent, Permits = \$125k
13	<p>Escalations (Labor, equipment, materials, fuel (currently, to be broken out separately into individual items)).</p>	<p>Order Early/Separate GMPs/Identify Stockpile storage location options</p> <p>At for Construction Design, GC includes Labor and Equipment (less fuel) escalations.</p> <p>Materials escalations to remain as Risk</p>	Cost	50%	\$ 1,000,000.00	\$ 500,000.00	0	0	5% year over year
17	<p>Encounter unsuitable material during screening native material for Intermediate Backfill. Cost to offhaul and import new material</p>		Cost	0%	\$ 332,150.00	\$ -	0	0	Intermediate Backfill = 5,643 CY x \$50/CY Buy/Haul added allowance for offhaul / disposal of unsuitable material = \$50k

May 2023 GMP2 Risk Register

22	If NDOT right-of-way staging areas at Spooner Summit are not available for project use at time of construction.	Use IVGID property or other location outside of basin (i.e. bottom of US 50)	Cost	33%	\$ 7,317,634.00	\$ 2,414,819.22	0		Risk Associated with losing our yard access. Lowering risk probability for GMP 1 due to preliminary occupancy permit discussed with NDOT for this season. Schedule impacts are significant. Without a yard, there can be no night shift. This would double our pipe install durations, schedule impacts from potholing, sawcutting, rail shifting, stringing pipe, etc. 70 added days of pipe, rail shifting, patch back.	Per recent discussions with NDOT permits regarding upcoming NDOT projects on US 50 and SR 28, the current yard use at SR 28 and US 50 "Spooner" summit is not guaranteed for IVGID's projects.
24	Emergency reposnse - Wildfire / Traffic accident	Emergency Response Plan	Cost & Schedule	25%	\$ 1,584,000.00	\$ 396,000.00	88	22		GMP 1 x 3 seasons
25	Added requirement to modify traffic control plan/system	Add Pilot Car	Cost	10%	\$ 1,234,066.00	\$ 123,406.60	0	0	Pilot Car: 4 Seasons	GMP 1 x 3 seasons
27	Unforeseen Special Events (Races & Marathons)	Consult Stakeholders Early & Often	Cost & Schedule	10%	\$ 516,000.00	\$ 51,600.00	20	2	4 Seasons X 5 Days = 20 Days	
29	Unforeseen TRPA required remediation measures at staging yards and/or areas in project limits.		Cost	67%	\$ 100,000.00	\$ 67,000.00	0	0		
35	Traffic Control Days - Additional Days for Schedule Delays		Cost	33%	\$ 818,786.25	\$ 270,199.46	380	89.73	Separate line item that will be used to track additional TC days due to unforeseen field conditions and other risks. Potential risk of days = 10 days	GMP 1 x 3 seasons
Totals					\$ 7,734,535.62	\$ 2,765,625.28	380	89.73		

DRAFT IVGID Effluent Export Pipeline CMAR CONSTRUCTION (Remaining Scope) - Risk Register					Quantitative Analysis				Comments	
Item	Description Of Risk	Mitigation Strategy	Type of Risk	Probability	Cost Impacts (\$)		Schedule Impacts (Working Days)		Original Comments	Additional Comments (Remaining Scope)
					Cost (\$)	Estimated Risk Amount	Time Impact	Estimated Time Impact		
2	Impact to production based on frequency and method of weld testing - Steel pipe (X-ray)	Develop Testing Procedure and Plan Frequency of Xray inspection to be determined and Impact	Cost & Schedule	50%	\$ 973,500.00	\$ 486,750.00	33	16.5	Assumed to be Owner provided third party QA inspection. Approximately 167 joints to inspect @ 2 hours per each = 334 hours	
3	New pipeline alignment conflicts with existing improvements (needs to include existing pipeline crossing alignment of new pipeline for future GMPs)	GPR, Pothole, Design out, survey existing conditions, purchase additional fittings	Cost & Schedule	25%	\$ 1,822,550.00	\$ 455,637.50	20	5	Conflict with existing pipeline alignment creating additional crossings or tie-in connection points Encounter unknown culvert crossings or other utilities (Guardrail, Concrete Curb & Gutter, AC Curb Removal and Replacement) 1,485 LF x \$830/LF	
6	Existing pipe discharge due to break or pipe failure (flooded trench, enviro release, etc) - outside of GC negligence	Emergency Response Plan, Repair parts on hand (in-stock) at local supply, etc. GC to make repairs and coordinate with IVGID operations throughout construction	Cost & Schedule	33%	\$ 817,500.00	\$ 269,775.00	15	4.95	Assume crew cost = \$20k/shift x 1 week x 3 seasons	
7	Encounter hard rock that needs to be excavated in excess of what is included in budget which triggers T&M tracking and payment over 8-hours of hydraulic hammering at a given location. Anticipated hard rock that may trigger this could include bedrock and/or large non-excavatable boulders. One trigger would be in excess of 8 hours of hammering per week that affects the pipe crew's production. Another would be if production begins to be affected when the lay crew catches up to the hammer hoe and is unable to install additional pipe. Pipe crew is considered labor, equipment, hauling, and subcontractors necessary to complete typical pipe installation.	- Improved quantification of known hard rock locations (to identify LF of trench) via GPR intel, followed up with pre-work package to include potholing (conventional or track-drilling). - Estimate includes Hammer Hoe attachment for nuisance rock - Rock-splitting to remove rock. - Correlate HDR PDR (June 2012) Rock excavation limits to current plan set	Cost & Schedule	33%	\$ 8,826,560.00	\$ 2,912,764.80	89	29.37	Based on preliminary analysis of GPR showing 6,000 of only 20,000 lf of the entire job, it is assumed there will be 9,000 yards of rock excavation for the whole job. Assume top half of trench has no rock ex. = 4,500 yards for entire job. Note this cost does not include Traffic Control or General Conditions	

DRAFT IVGID Effluent Export Pipeline CMAR CONSTRUCTION (Remaining Scope) - Risk Register					Quantitative Analysis				Comments	
					Cost Impacts (\$)		Schedule Impacts (Working Days)			
Item	Description Of Risk	Mitigation Strategy	Type of Risk	Probability	Cost (\$)	Estimated Risk Amount	Time Impact	Estimated Time Impact	Original Comments	Additional Comments (Remaining Scope)
9	This is risk associated with ground water in excess of what GC can pump with a 2" sump pump and discharge onsite (Granite is considering this nuisance water). This will be triggered if Granite needs to upsize the pump, treat the water that is in the work zone, and/or offhaul water in water trucks.	Proper Permits & Dewatering Equip, coordinate with local agencies	Cost & Schedule	25%	\$ 50,000.00	\$ 12,500.00	4	1	Account for 500LF of overall pipeline length (near Bliss, Secret Creek, and Skunk Harbor) 500 LF = 1 months rent (de-watering system) x \$50,000 per month	
12	Delay start of construction due to availability of materials, weather delay, funding, permitting.	Identify & Order Early/Separate GMP	Cost & Schedule	33%	\$ 450,000.00	\$ 148,500.00	15	4.95	5 days of weather per season. Currently carrying an additional 15 days of weather in OPC C	
13	Escalations (Labor, equipment, materials, fuel (currently, to be broken out separately into individual items).	Order Early/Separate GMPs/Identify Stockpile storage location options At for Construction Design, GC includes Labor and Equipment (less fuel) escalations. Materials escalations to remain as Risk	Cost	50%	\$ 1,000,000.00	\$ 500,000.00	0	0	5% year over year	Direct Cost less GCCO Labor & Equipment =
22	If NDOT right-of-way staging areas at Spooner Summit are not available for project use at time of construction.	Use IVGID property or other location outside of basin (i.e. bottom of US 50)	Cost	58%	\$ 2,400,000.00	\$ 1,399,200.00		0	Haul to dump hill site currently at \$2.4M. Haul to bottom of Spooner Summit in Carson City \$1.4M (most logical scenario, working on an agreement)	Per recent discussions with NDOT permits regarding upcoming NDOT projects on US 50 and SR 28, the current yard use at SR 28 and US 50 "Spooner" summit is not guaranteed for IVGID's projects.

DRAFT IVGID Effluent Export Pipeline CMAR CONSTRUCTION (Remaining Scope) - Risk Register					Quantitative Analysis			
					Cost Impacts (\$)		Schedule Impacts (Working Days)	
Item	Description Of Risk	Mitigation Strategy	Type of Risk	Probability	Cost (\$)	Estimated Risk Amount	Time Impact	Estimated Time Impact
24	Emergency reposnse - Wildfire / Traffic accident	Emergency Response Plan	Cost & Schedule	33%	\$ 1,221,000.00	\$ 402,930.00	66	21.78
25	Added requirement to modify traffic control plan/system to accommodate NDOT or reduce traffic risk.	Add Pilot Car	Cost	35%	\$ 925,550.00	\$ 323,942.50		0
27	Unforeseen Special Events (Races & Marathons)	Consult Stakeholders Early & Often	Cost & Schedule	10%	\$ 442,500.00	\$ 44,250.00	15	1.5
29	Unforeseen TRPA required remediation measures at staging yards and/or areas in project limits.		Cost	40%	\$ 100,000.00	\$ 40,000.00	0	0
35	Traffic Control Days - Additional Days for Schedule Delays		Cost	33%	\$ -	\$ -	341	85.05
Totals					\$	6,996,249.80	341	85.05