History and Contracting Method for Tacoma Water's 150 MGD Green River Filtration Facility

PNWS-AWWA Pre-conference Tour
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PRESENTATION TOPICS

- Project background, consultant team and Tacoma Water project team
- Early Decisions
- Washington State GC/CM
- Selection process for GC/CM
- Preconstruction services
- Benefits realized
- Project schedule, budget and final cost

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BRINGING A 100-YEAR OLD WATER SUPPLY INTO THE 21ST CENTURY

1893- Tacoma Water begins providing water service

1913- Green River Supply System Completed

2014 (Dec.) – Green River Filtration Facility begins operation

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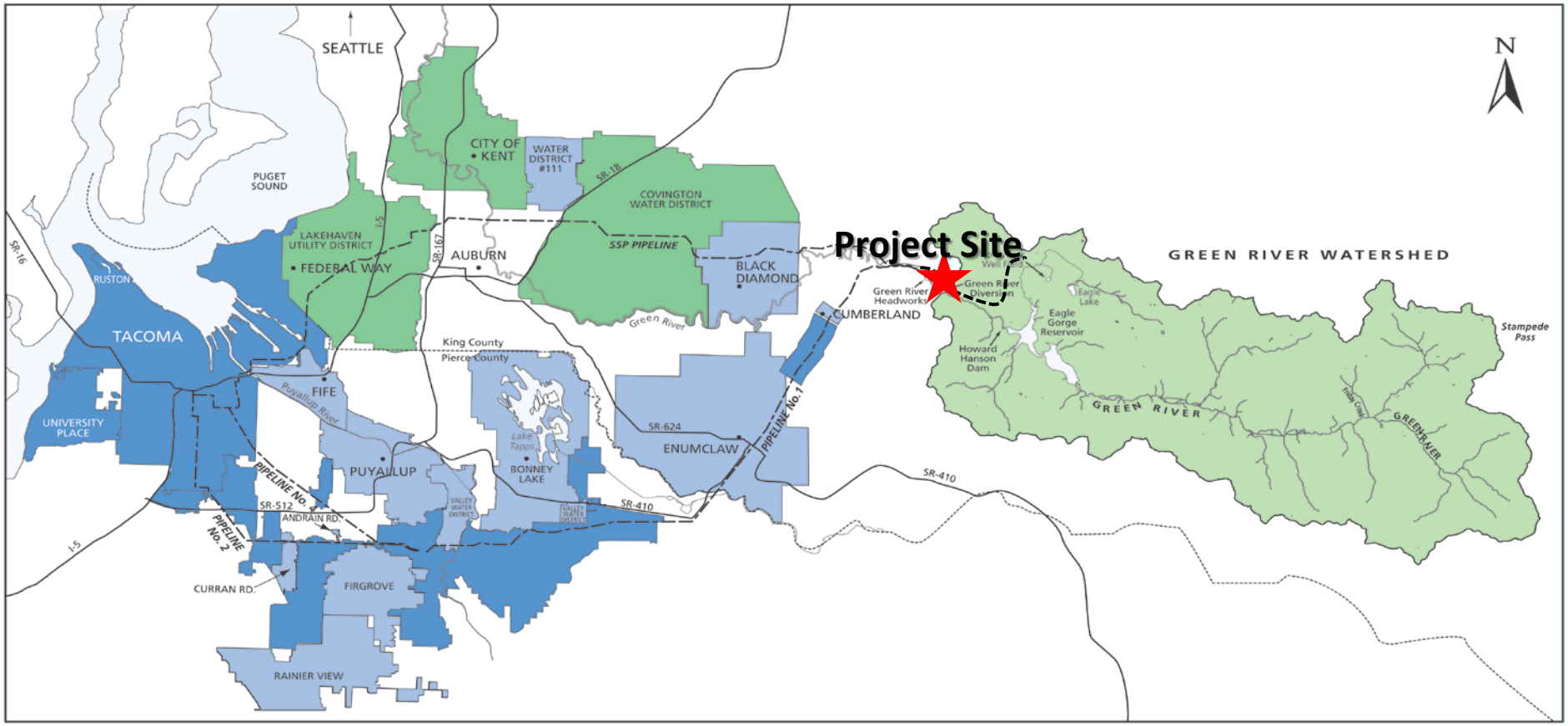
PROJECT BACKGROUND

- Tacoma Water was one of the few remaining large unfiltered water systems in the nation
- Source Water: Green River
- Tacoma Project Partners:
    - Covington Water District (11% share)
    - City of Kent (11% share)
    - Lakehaven Utility District (11% share)
- From 2009-2010 Tacoma Water and Partners undertook a study leading to decision to move forward with 150 MGD filtration facility
- At the conclusion of the decision report Tacoma Water undertook a study to determine project delivery method

THE GREEN RIVER WATER SUPPLY

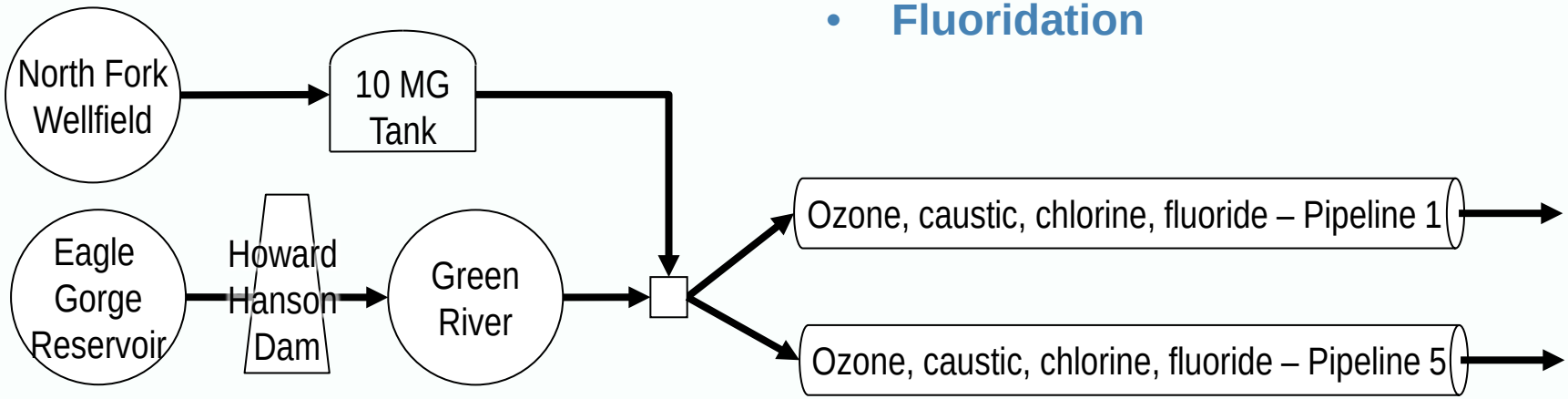
- 250 sq. mile protected watershed in the Cascade Mountains
- Subject to flashy water quality conditions
- Currently serves as unfiltered supply for Tacoma and surrounding communities
- Supplemented with ground water when needed



PREVIOUS UNFILTERED TREATMENT SYSTEM

- **Green River supplies can be blended with North Fork Wellfield supply to reduce turbidity**

- **Ozone for taste & odor control and disinfection**
- **pH adjustment (caustic soda)**
- **Disinfection (sodium hypochlorite)**
- **Fluoridation**



Finished water is discharged into two pipelines for conveyance to customers

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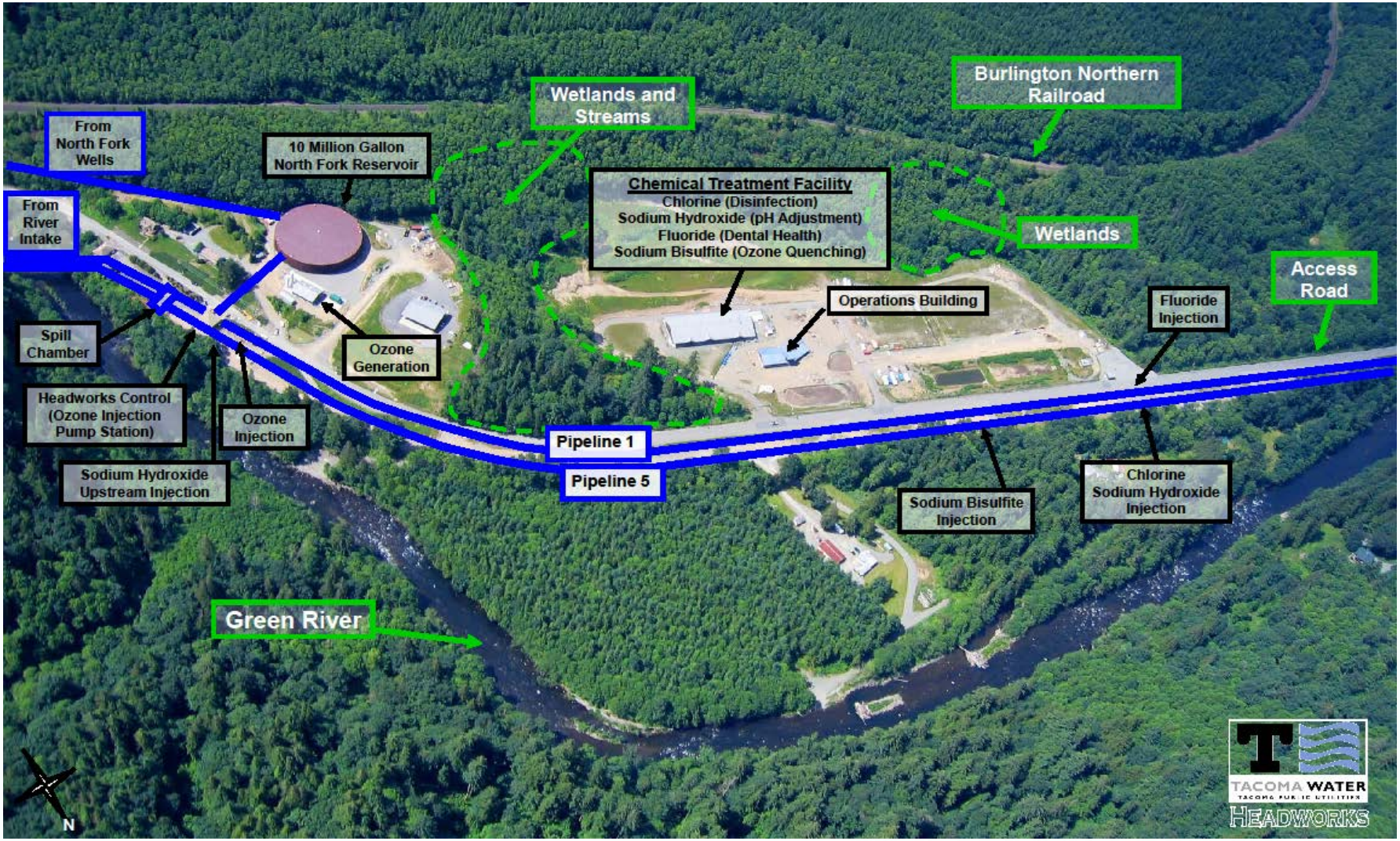
PREVIOUS UNFILTERED TREATMENT PLANT



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PROJECT DELIVERY TEAM

- MWH Americas – Design Consultant
- Leidos Engineering, LLC - Owner Agent
  (formerly SAIC Energy, Environment and Infrastructure, LLC)
- K&L Gates, LLC - Legal Support
- Hoffman Construction Company - GC/CM
- Krazan & Associates - Special Inspection / Testing Services
- Tacoma Water Dedicated Project Team:
  - Randy Krueger – Senior Project Manager
  - Jason Moline – Principal Engineer
  - Gary Fox – Professional Engineer
  - Shawna Waters – Administrative Assistant
  - George Hauser – Engineering Construction Coordinator
  - Jeff Stone – Engineering Construction Coordinator

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THE DECISION PROCESS (2009-2010)

IDENTIFY THE OPTIONS; COMMUNICATE THE CHOICES:

OPTIONS

- Treatment options relatively simple: filter or ultraviolet light
- Within those – 13 alternatives evaluated
    - Hybrid filtration (conventional winter / Direct summer) selected

CHOICES:

- Risk
- Cost
- Value

THE DECISION TO FILTER

TACOMA WATER RECOMMENDS FILTRATION:

- Regulatory compliance & the greatest level of future regulatory certainty.
- Filtration will provide substantial improvement to water quality.
  - Silt & sand; color; disinfection byproducts
- Filtration will improve the reliability and yield of the Green River supply.
- Filtration will provide capability to respond to operations at Howard Hanson Dam.
- On balance, stakeholder input (understanding concerns related to rate impacts), notes favor toward longer-term and more robust filtration alternative.
- Pilot studies support it will work

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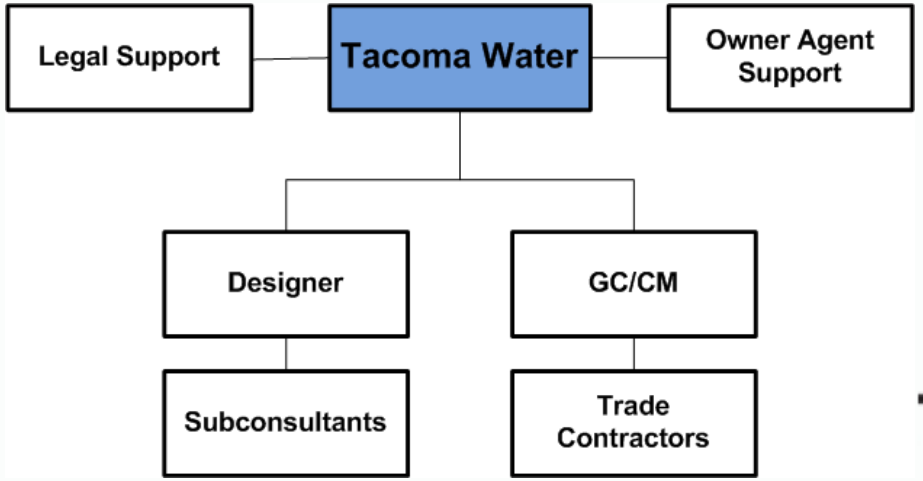
DECISION TO USE GC/CM

GC/CM selected because Tacoma Water believed this option provides the best balance of benefits

- Ability to obtain early construction involvement (value engineering input, cost estimating, constructability reviews etc.)
- Strong collaboration between Tacoma Water, design engineer and GC/CM (important because of critical nature of facility)
- Reduce claims and change orders
- Importance of working close to critical operating facilities
- Added assurance of keeping project on schedule and within budget



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WASHINGTON STATE GC/CM

- Alternate construction process allowed by state law
- Special provisions per chapter 39.10 RCW
- Selection of GC/CM based on qualifications and price
- GC/CM brought on board early in design process
- GC/CM can self-perform up to 30% of the work (MACC), but must bid on this work (recent legislation has revised this)
- GC/CM issues bid packages for all scopes of work and must accept low bid

GC/CM SELECTION PROCESS

- **Received approval from CPARB-PRC on 12/2/2010**
- **Used 3 step process:**
  - Request for proposals (qualifications based proposal)
  - Interviews
  - Request for final proposals
- **Selection based on point scoring system**
- **Received RFP responses from 6 companies**
- **Based on RFP scoring interviewed 3 companies**
- **Final proposals requested of two companies**
  - GC/CM fee (overhead and profit) expressed as percentage of MACC
  - Fixed cost for Specified General Conditions

OUR SELECTION POINT SCORING

Proposal

Proposer	Total
Firm 1	4200
Firm 2	4319
Firm 3	3723
Firm 4	4263
Firm 5	3081
Firm 6	3724

Interview

Proposer	Total
Firm 1	1265
Firm 2	1500
Firm 4	1435

Total Score for Proposal and Interview

Proposer	Total
Firm 1	5465
Firm 2	5819
Firm 4	5698

Final Proposal

Proposer	Percent Fee Percentage	Total Estimated MACC	Percent Fee Amount	Specified General Conditions Work	Total Bid	Points
Firm 2	3.69%	$161,000,000	$5,940,900.00	$3,169,000.00	$9,109,900.00	200
Firm 4	3.60%		$5,796,000.00	$3,801,211.00	$9,597,211.00	190

Results

Proposer	Total
Firm 2	6019
Firm 4	5888

Hoffman Construction Company of Washington Selected

KEY CHALLENGES ADDRESSED DURING PLANNING AND DESIGN

- Maximizing use of the limited site
- Bypassing of the sedimentation basins during summer months
- Getting the coagulation chemistry correct
- Designing an effective solids handling system
- Meeting an aggressive schedule for design and construction

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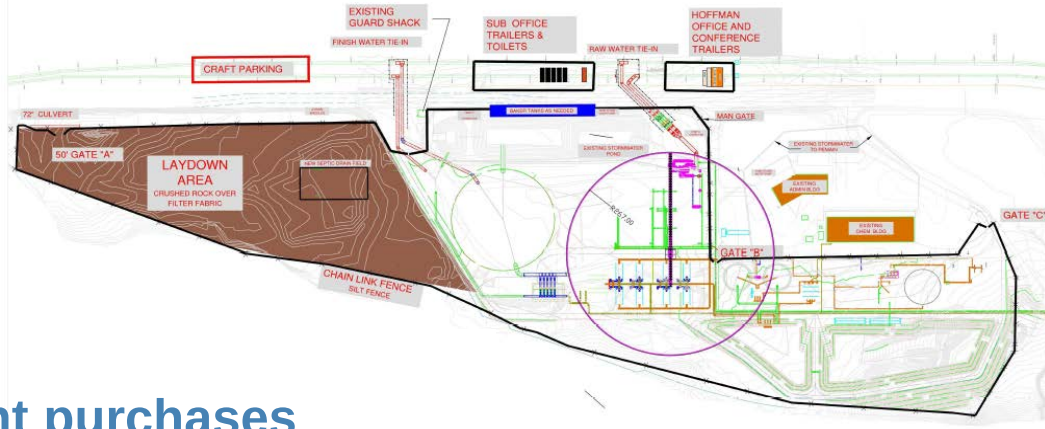
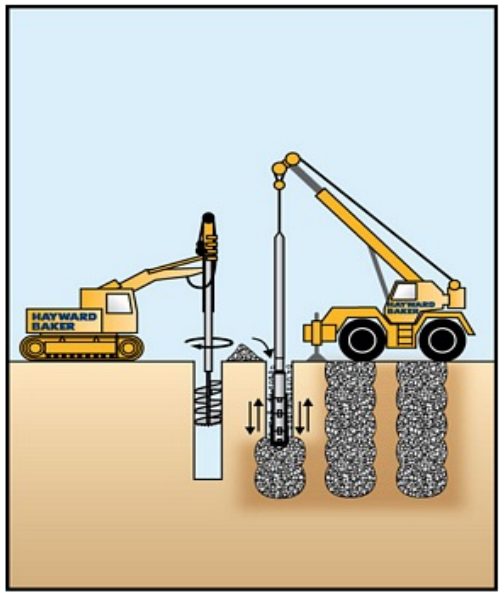
GC/CM PRECONSTRUCTION SERVICES

- Develop constr. plans: management, site logistics, safety & QA/QC
- Use of Building Information Modeling (BIM)
- Cost estimating (30%, 60% and 90% (MACC))
- Document reviews
- Value engineering ideas/design input
- Constructability reviews
- Construction sequencing
- Construction schedule
- Subcontractor outreach
- Early subcontracting/equipment purchases



GC/CM BENEFITS REALIZED

- **Early design input**
  - Creative value engineering analysis
  - Alternative construction options for cost savings
  - Reliable cost estimates
  - Scheduling/sequencing of construction
  - Assistance with startup/commissioning plans
  - Site logistics plan



- **Ability to separate out early construction and equipment purchases without responsibility concerns**
- **Partnership with owner and designer throughout all project phases**

GC/CM contracting brings the full project team together early and results in collaboration/team decision making

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VALUE ENGINEERING (VE) REVIEWS

Two reviews: 30% and 60% design completion levels

Performed by independent, senior, subject area experts

- **30% VE session focus and savings, Sept. 2011**
  - Treatment process recommendations
  - Ease and efficiency of operations
  - Responsiveness in highly variable conditions
  - Efficiency of facility layout
  - Resultant savings: $10 – 12 M
- **60% VE session schedule and focus, Jan. 2012**
  - Systems focus – Electrical and control, structural and building systems, piping systems and earthwork
  - Resultant savings: Approximately $1M

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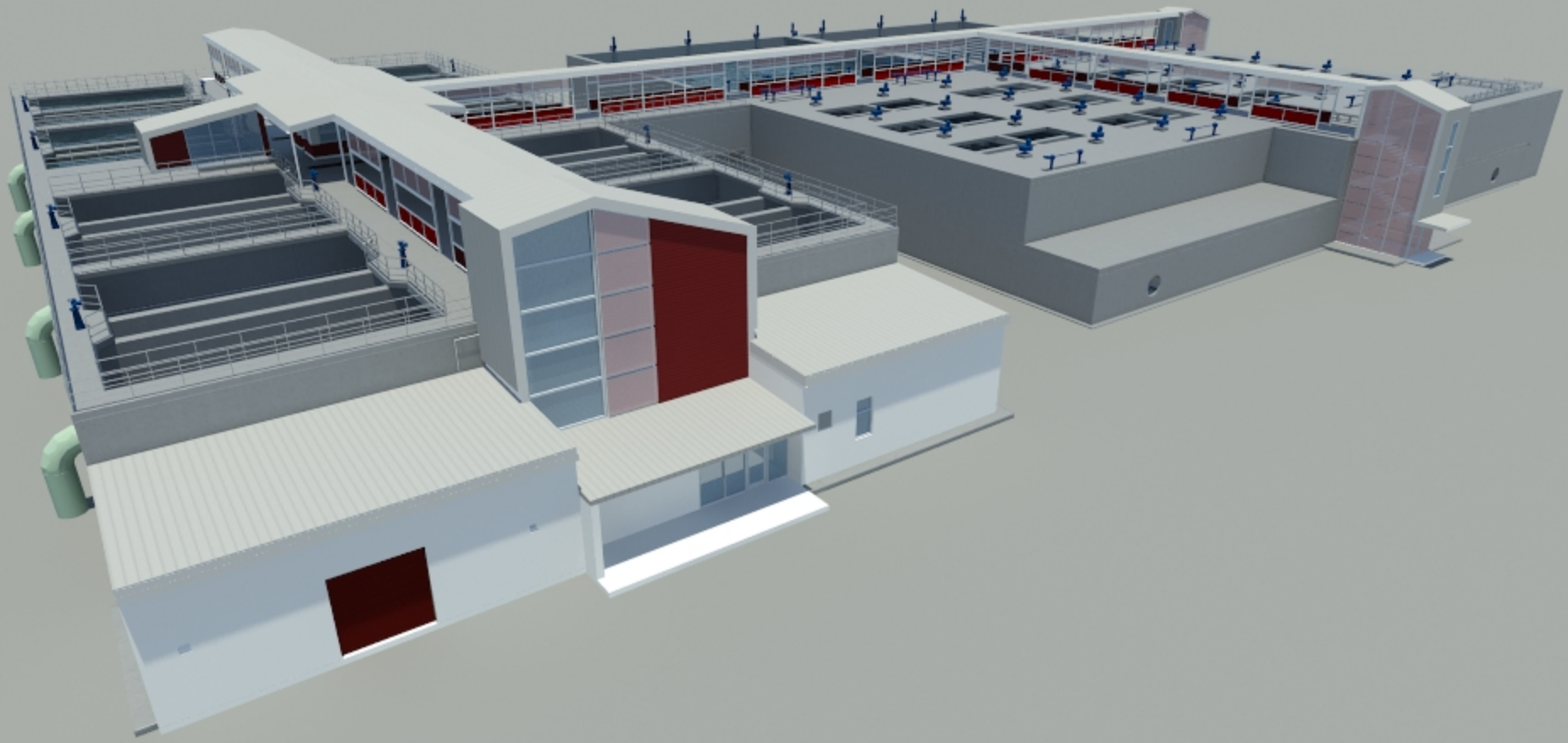
USE OF 3D DESIGN AND BIM

FLOC/SED BASIN AND FILTER COMPLEX



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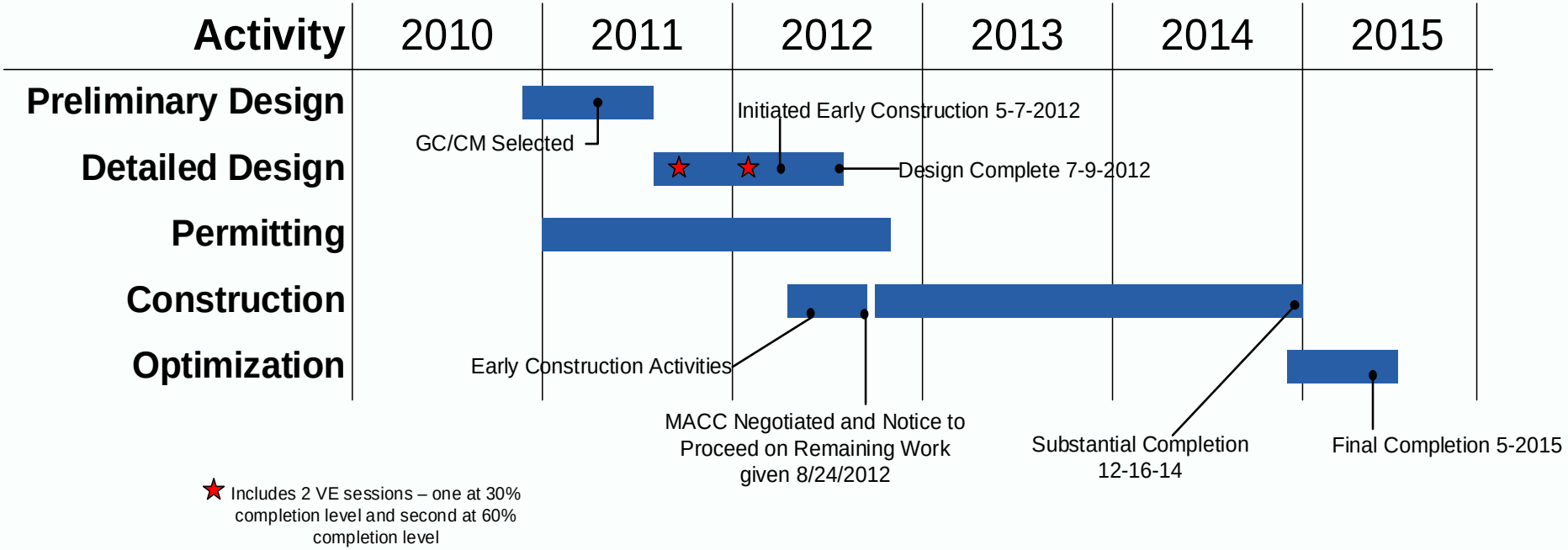
SCHEDULE



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GRFF PROJECT BUDGET AND FINAL COST

COST ITEM	BUDGET AT DESIGN COMPLETION	CONSTRUCTION CONTRACT EXECUTED WITH GC/CM	COST AT COMPLETION	SAVINGS (see note)
GC/CM TOTAL CONTRACT *	$ 163,277,274	$ 149,316,782	$ 147,200,000	$ 2,116,782
GC/CM PRECONST SERVICE *	$ 840,000	$ 575,000	$ 575,000	$ -
PSE POWER UPGRADE	$ 3,500,000	$ 3,500,000	$ 2,857,000	$ 643,000
KC PERMITS & SPECIAL INSPECTIONS	$ 3,000,000	$ 3,000,000	$ 1,250,000	$ 1,750,000
TW INTERNAL LABOR & EXPENSES	$ 6,500,000	$ 6,500,000	$ 5,900,000	$ 140,000
CONSULTANTS	$ 15,000,000	$ 15,000,000	$ 15,000,000	$ -
TW PROJECT CONTINGENCY	$ 4,000,000	$ 3,500,000	$ 1,750,000	$ 1,800,000
SUBTOTAL	$ 196,117,274	$ 181,391,782	$ 174,482,000	$ 6,909,782
SALES TAX ON CONTRUCTION (8.6% TIMES * ITEMS)	$ 14,759,086	$ 12,890,693	$ 12,708,650	$ 182,043
TOTAL	**$ 210,876,360**	**$ 194,282,475**	**$ 187,190,650**	**$ 7,091,825**

Note: Savings reflects difference between GC/CM Construction Contract 4/2012 and final completion.

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