

Vista Grande Drainage Basin Alternatives Analysis

Public Meeting
September 17, 2008

Vista Grande Watershed



2.6 square miles = 1,700 acres

Background

- Vista Grande Watershed Study was presented to the City by RMC in October 2006 with the following findings:
 - The canal and tunnel are significantly undersized
 - Recommended use of a 25-year design storm event for design of system improvements
 - Downstream improvements are needed before other storm drain improvements can begin
 - Recommended a tunnel south of the County Line
- In November 2006, RMC was hired to measure winter storm flows in the existing basin storm drain system, calibrate the City's storm drain system model based on recent storm events, better define the flows generated in a 25 year 4 -hour storm event, and outline upstream pipeline improvements to manage the flows

Background (Cont.)

- In March 2007, Jacobs Associates was hired to evaluate alternatives for managing downstream storm flows
 - Jacobs Associates evaluated multiple tunnel alignment, storm water detention, outfall structure location, water re-use and canal improvement alternatives.
 - The initial findings and recommendations were outlined in the *Vista Grande Drainage Basin Alternatives Report (Draft)* dated December 12, 2008 and presented in two public Meetings on February 21 and 26, 2008.

Levels of Protection and Risk Management

- Levels of storm protection are typically outlined in recurrence intervals based on the likelihood of occurrence:
 - 10-yr storm has a 10% chance of occurrence in any given year
 - 25-yr storm has a 4% chance of occurrence in any given year
 - 100-yr storm has a 1% chance of occurrence in any given year
- Design standards are selected based on risk tolerance and the potential to produce catastrophic flooding, property damage, and personal injury

Drainage Facilities and Design Standards

- Typical Facility Types and Design Standards
 - Major facilities (typically regional in nature) – have tributary areas greater than 25 square miles – typically designed for 100-yr storm recurrence
 - Primary facilities – have tributary areas between 50 acres to 25 square miles – typically designed for 25-yr storm recurrence
 - Secondary facilities (typically local storm drains) – have tributary areas less than 50 acres – typically designed for 10-yr storm recurrence
 - In urban areas, storm drains are assumed to convey runoff from a 10-yr storm
 - Runoff in excess of 10-yr storms flow overland in streets
- Daly City Storm Drain Design Standards
 - Local storm drains designed to convey 10-yr storm and maintain water surface 0.5 feet below the street elevation

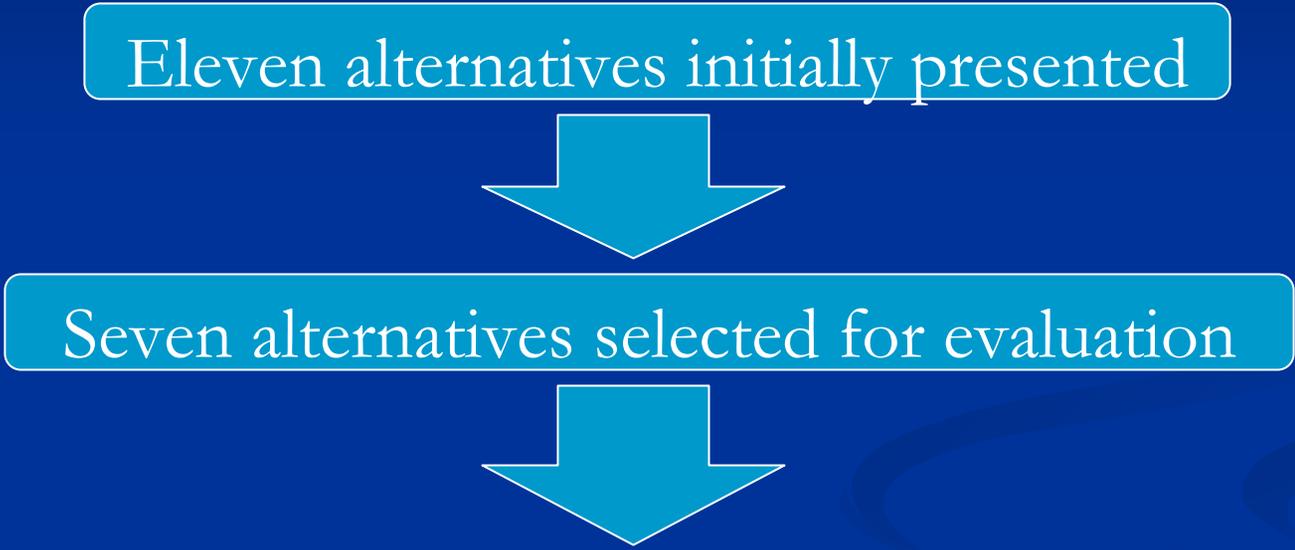
City Objectives

- Manage storm flows generated in a 25 year 4 -hour storm event
 - Improve public safety
 - Minimize property damage
 - Minimize public inconvenience
- Encourage the environmental uses of storm water including:
 - Reduce overflows into Lake Merced.
 - Develop wetlands areas.
 - Enhance Lake Merced water level.
 - Detain storm water and recharge groundwater.

Previous Findings and Recommendations

Initial Screening Approach of Alternatives:

Eleven alternatives initially presented



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graph TD; A[Eleven alternatives initially presented] --> B[Seven alternatives selected for evaluation]; B --> C[Four selection criteria];
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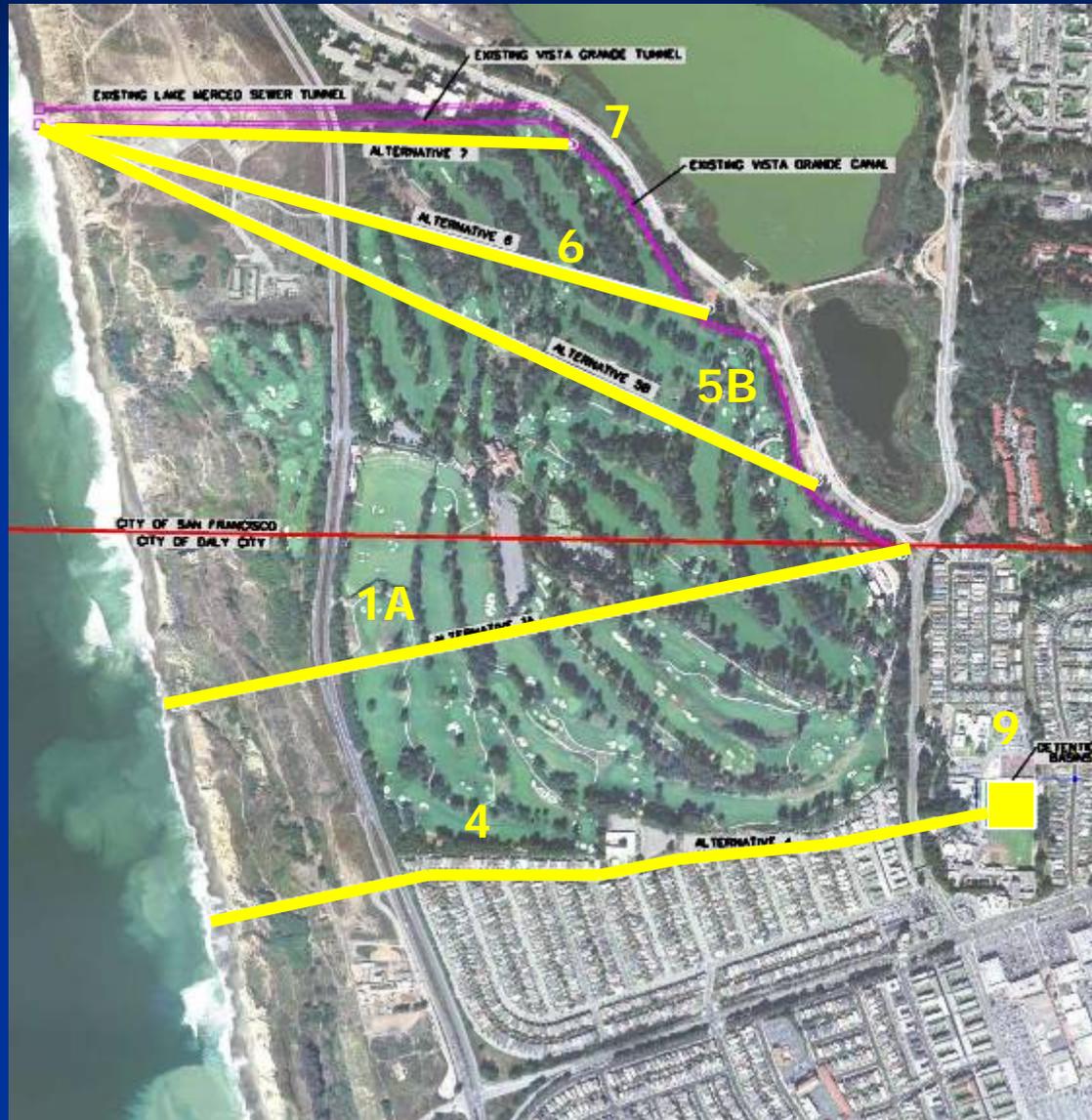
Seven alternatives selected for evaluation

- Leverage existing storm water assets
- Minimize right-of-way acquisition due to time and cost
- Minimize permitting effort and duration
- Locate where there is acceptable ground stability

Initial Alternatives



Selected Alternatives



Currently Known Environmental Issues to be Identified by Study

- Impact to environmental resources:
 - Bird habitat
 - Beach erosion and replenishment
 - Beach access and obstructions
 - Water quality, public health and safety
 - Recreation activities and park resources
 - Aesthetics
 - Ocean resources
- Regulatory process to follow CEQA and NEPA:
 - Right-of-way
 - Permitting
 - Wetlands
 - Recreational activities and park resources

Geotechnical Limitations

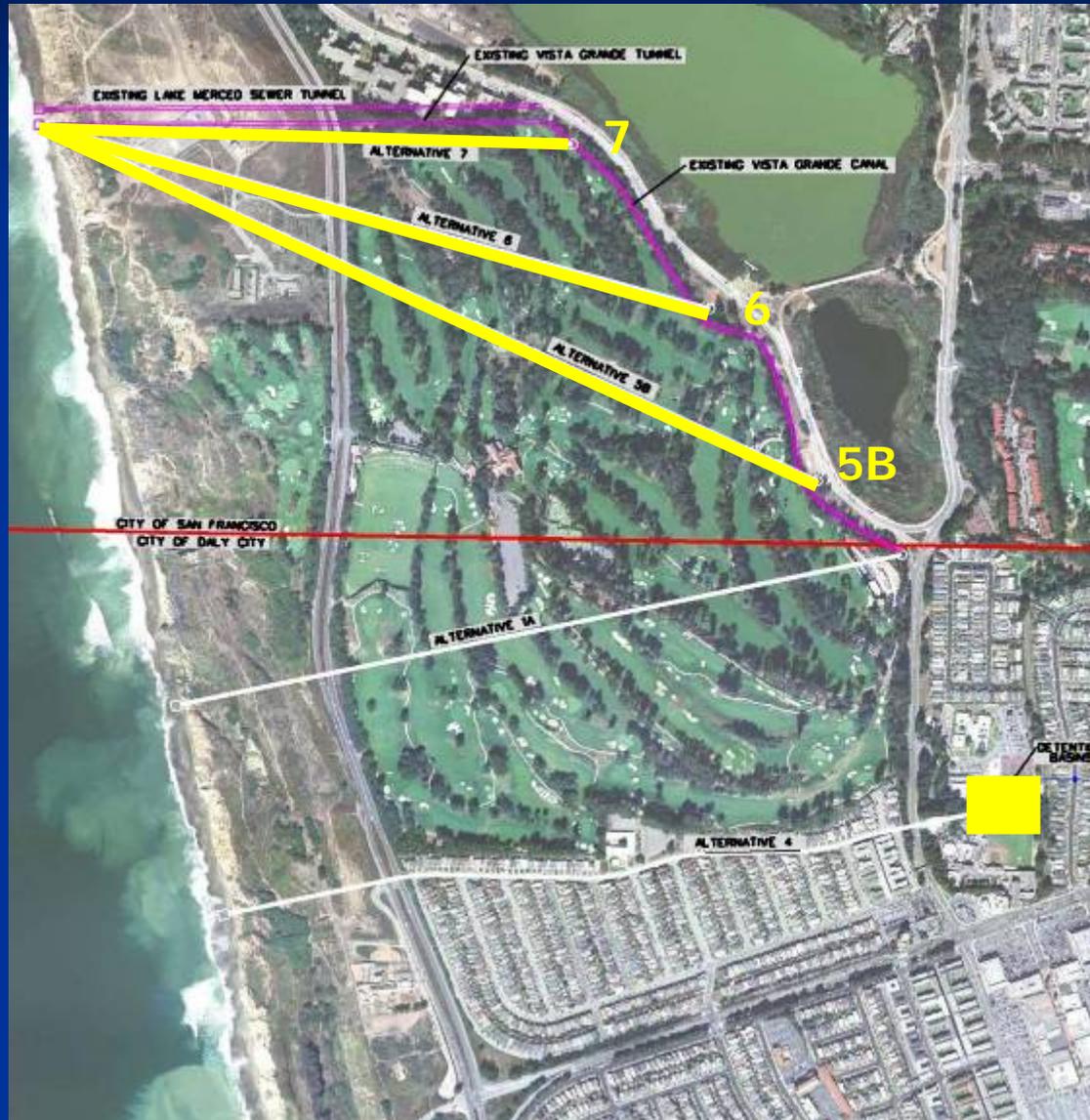


Existing
landslides and
aggressive bluff
sloughing

Evaluation Criteria:

- Provide capacity of the combined alternative system for the 25year - 4hr event
- Provide environmental benefits
- Construct the new capacity within an acceptable duration
- Minimize operating and maintenance cost and complexities
- Minimize environmental compliance requirements
- Minimize right-of-way acquisition
- Minimize construction cost and maximize life cycle savings

Screened Alternatives



Range of Costs
\$145M - \$196M

Comments

- Residents were concerned that the 25-year level of storm protection was insufficient
- Residents were concerned that selection of a northerly alignment would be difficult and time consuming to implement

Comments (Cont.)

- San Francisco desired a tunnel entry portal outside of the City/County of San Francisco (south of John Muir Drive) to minimize construction impacts to San Francisco residents
- San Francisco expressed concerns regarding the impacts to Lake Merced in a greater than 25-yr storm event
- San Francisco expressed concerns regarding impacts on acceleration of wetlands construction

Supplemental Analyses

Levels of Protection and Risk Management

- Level of storm protection are typically outlined in recurrence intervals based on the likelihood of occurrence
 - 10-yr storm has a 10% chance of occurrence in any given year
 - 25-yr storm has a 4% chance of occurrence in any given year
 - 100-yr storm has a 1% chance of occurrence in any given year
- Design standards are selected based on risk tolerance and the potential to produce catastrophic flooding, property damage, and personal injury

City Objectives

- Manage storm flows generated in a 25 year 4 -hour storm event
 - Improve public safety
 - Minimize property damage
 - Minimize public inconvenience
- Encourage the environmental uses of storm water including:
 - Reduce overflows into Lake Merced
 - Provide for wetlands areas
 - Enhance Lake Merced water level management
 - Store and recharge groundwater

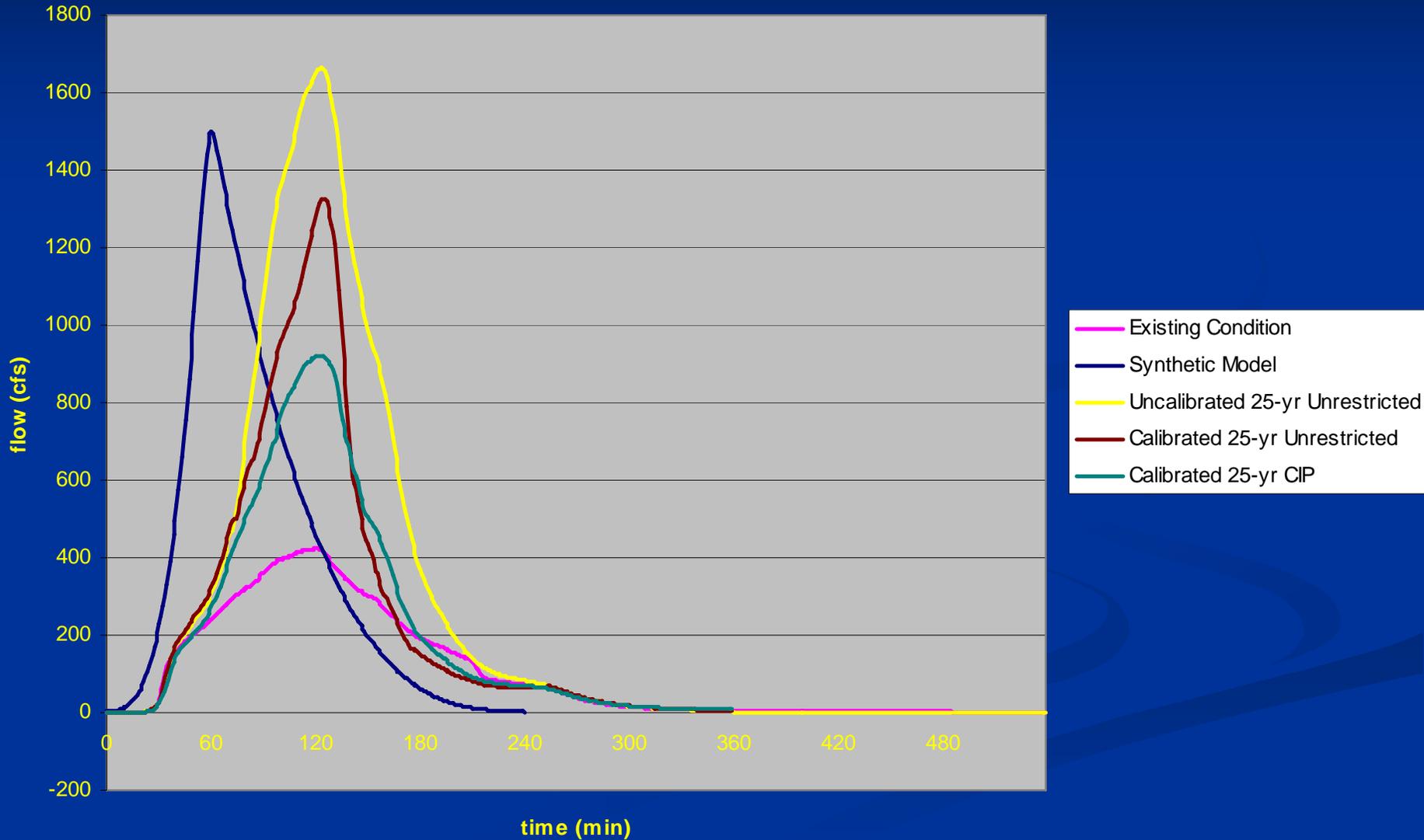
Work Focus

- Refinement of hydraulic information
- Refinement of alternatives
- Refinement of outfall alternatives
- Analysis of construction staging alternatives
- Discussion with regulatory agencies
- Outline of upstream improvements
- Environmental planning
- Alternative recommendation

Hydraulic Update

- Jacobs Associates developed a synthetic hydrograph for initial tunnel and storage sizing
- RMC calibrated the basin storm drain hydraulic model and developed flow characteristics under various scenarios
 - Oversize all pipes within the basin to deliver flows to the canal area without any restrictions
 - Developed an unconstrained flow hydrograph for the 25-yr storm in the calibrated model
 - Increased storm drain capacity to accommodate the 25-yr storm and maintain water elevation at 0.5 feet below street level

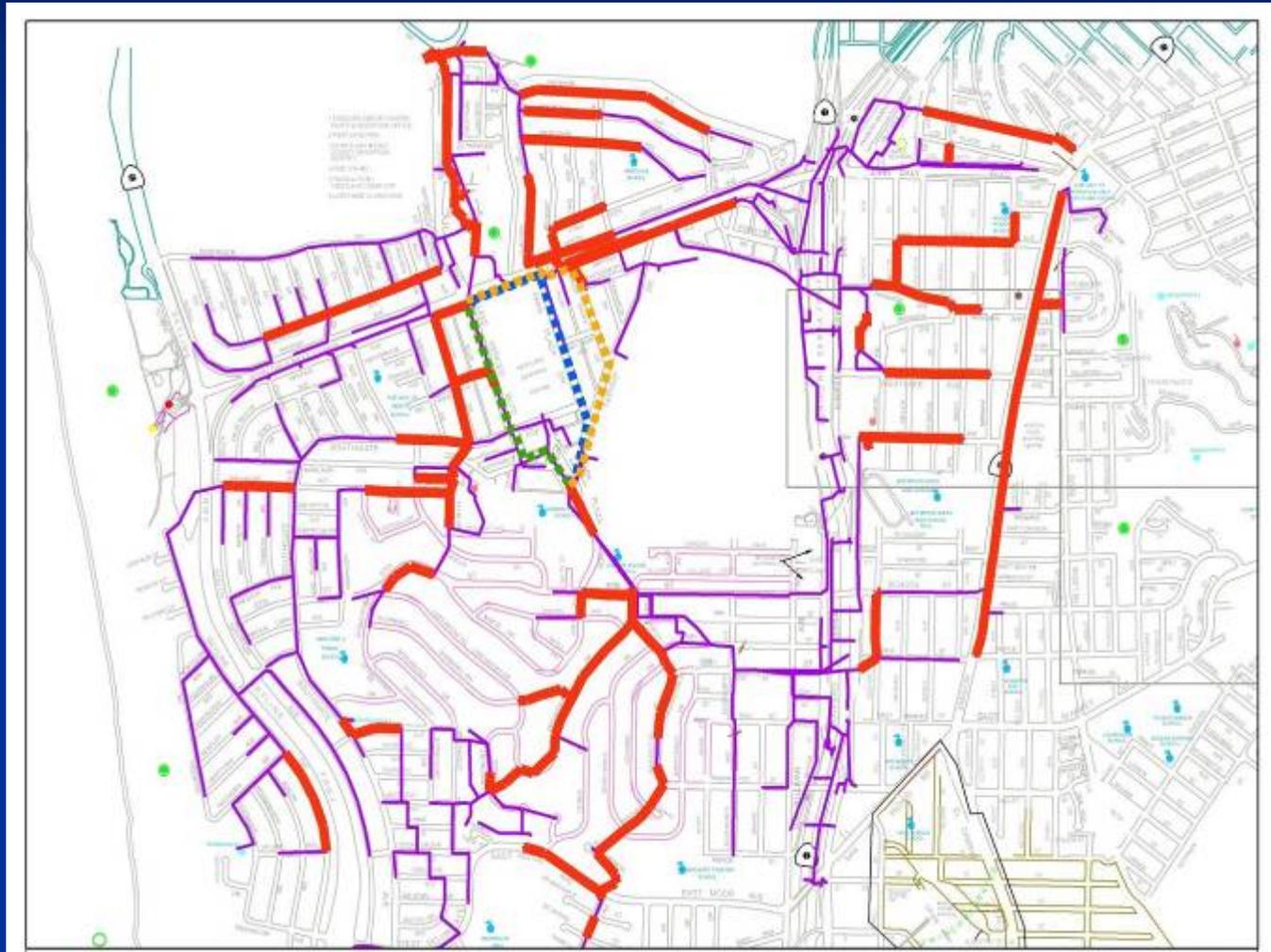
Hydraulic Update (Cont.)



Hydraulic Update (Cont.)

- Peak Flow Rates in a 25-yr storm
 - Synthetic model = 1,500 cfs, total volume = 43 MG
 - Oversized system without restrictions (pre-calibration, conservative, outside high, flow rate) = 1,660 cfs, total volume = 63.8 MG
 - Calibrated model without flow restrictions = 1,330 cfs, total volume = 43.8 MG
 - Accounts for reduced impermeable surface estimate in model from 80-90% to 60-70%
 - Does not account for diversions out of the canal system
 - Calibrated model designed for 25-yr storm = 930 cfs, total volume = 38.5 MG
 - Accounts for diversions out of the canal system (86 cfs = 3.8 MG)
 - Accounts for storage within the system (pipelines, manholes and catch basins to 0.5 feet below street grade) estimated at 1.5 MG

Upstream Improvements

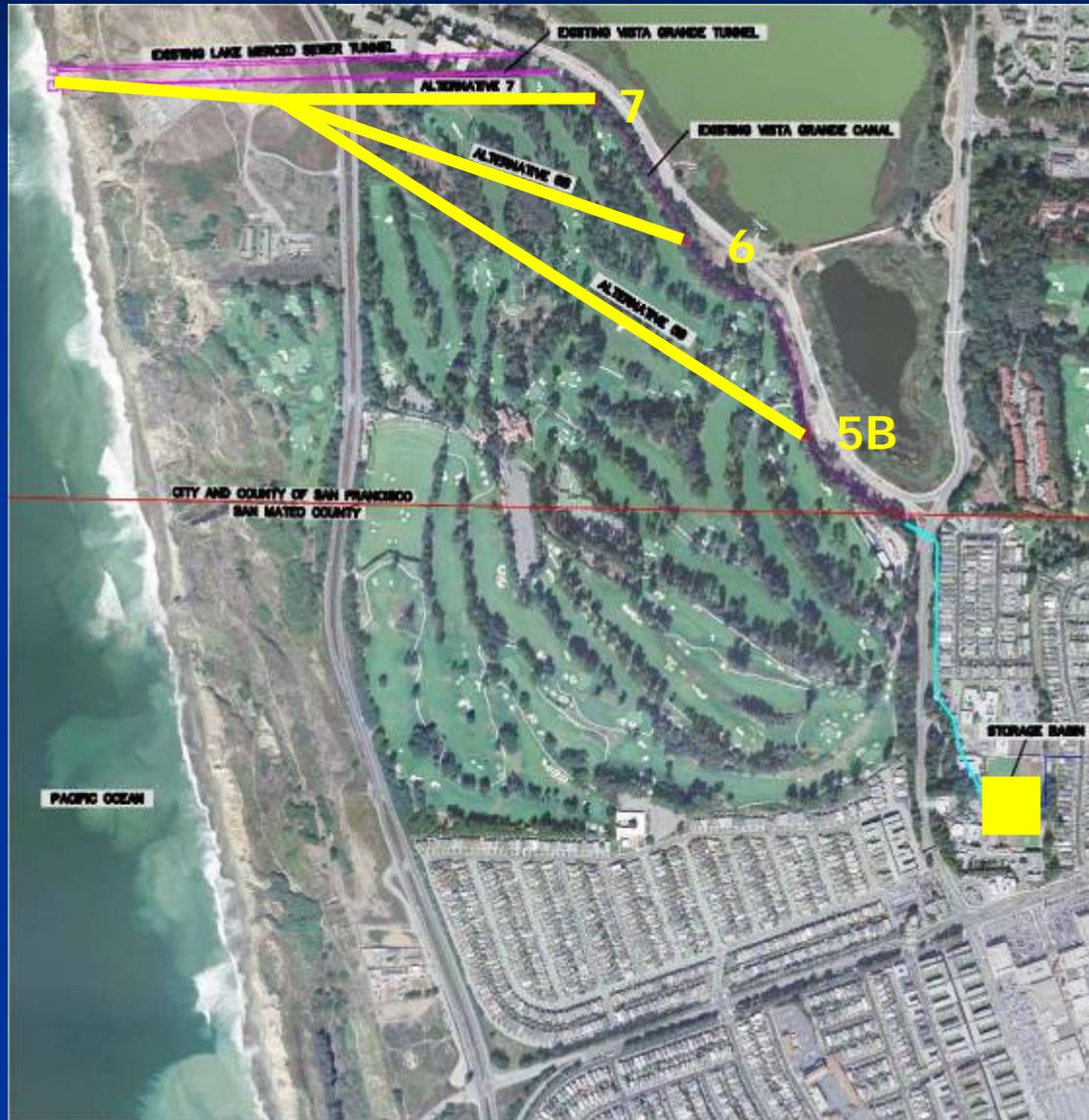


9.5 miles of storm drain upgrades - \$25M - \$30M

Refinement of Alternatives

- Jacobs Associates continued refining the flow characteristics of the alternatives based on the updated worst-case hydrograph provided by RMC
 - Adjusted storage capacity
 - Refined tunnel and box culvert slopes
- Evaluated incorporation of the sewer force main outfall
- Furthered the design of the outfall structure – combined structure for the existing and new tunnel and assessed impacts to the beach during construction
- Investigated alternatives to John Muir Drive as primary construction access point to reduce construction/traffic impacts to John Muir Drive and Lake Merced Boulevard
 - Using Fort Funston
 - Olympic Club maintenance facility
- Updated cost estimates

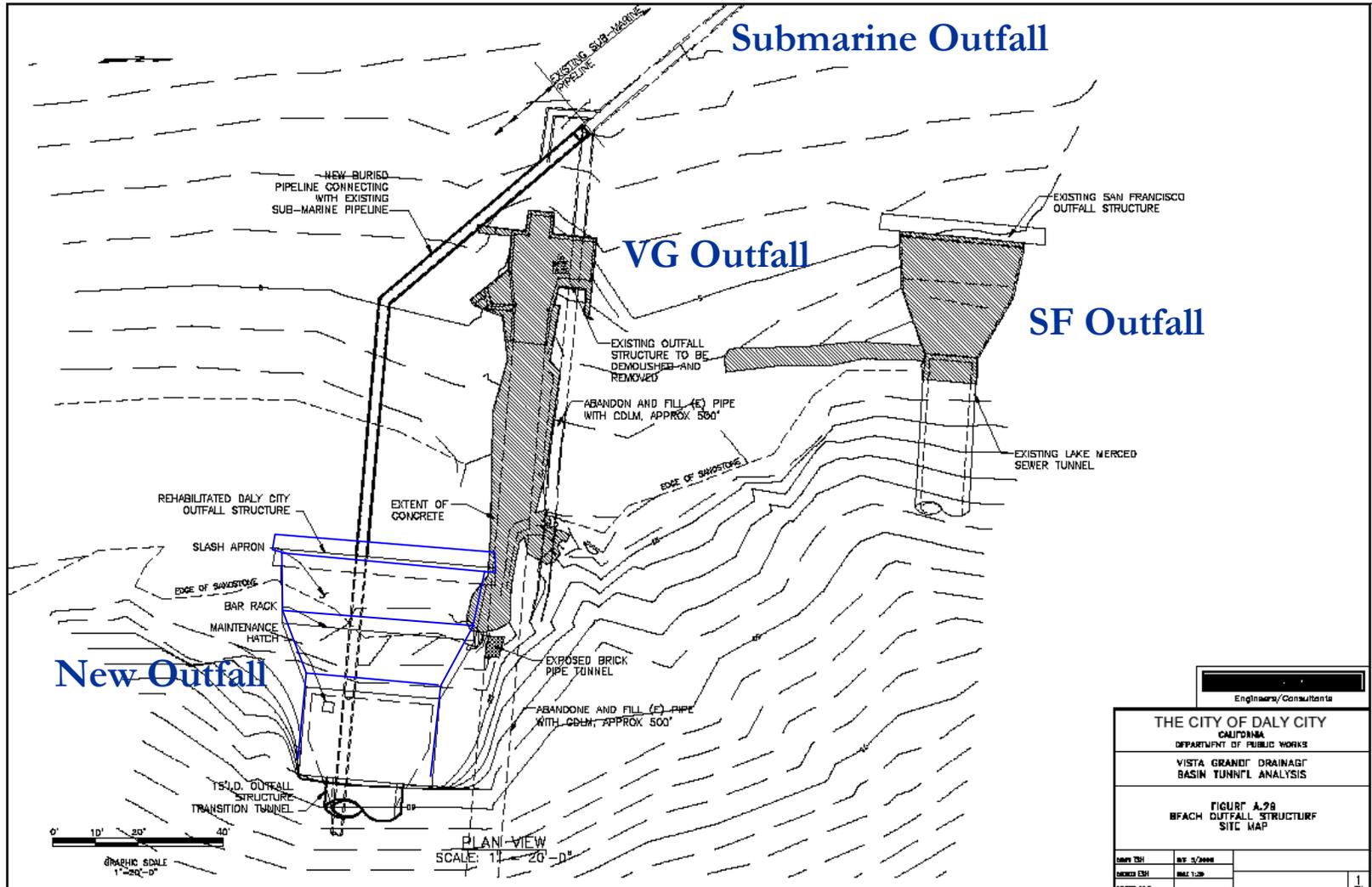
Refined Alternatives



Range of Costs

\$180M - \$220M

Tunnel Outfall



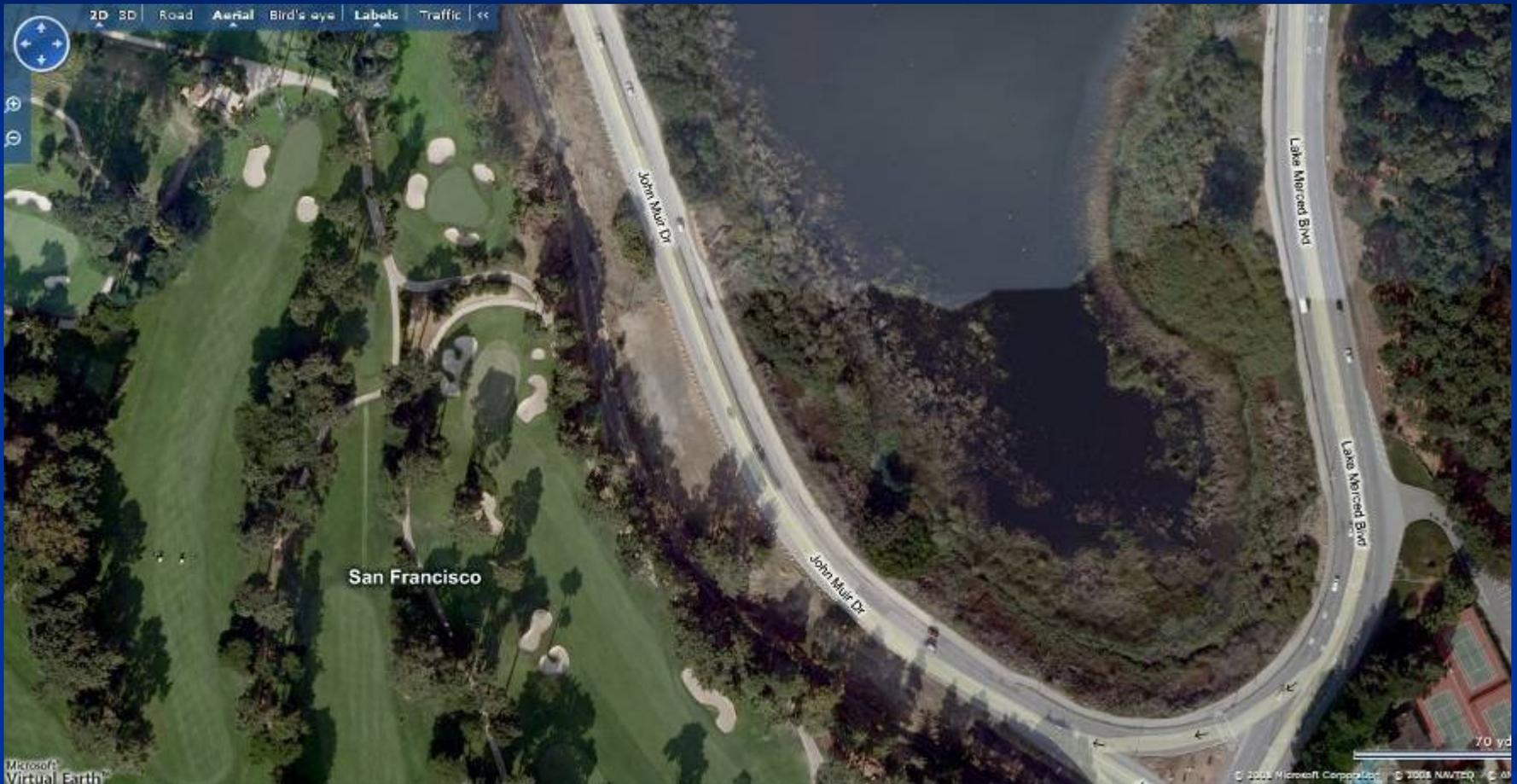
Engineers/Consultants

THE CITY OF DALY CITY
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
VISTA GRAND DRAINAGE
BASIN TUNNEL ANALYSIS

FIGURE A-98
BFACH OUTFALL STRUCTURE
SITE MAP

DATE: 12/1/00	BY: S/0000	
DRAWN: EKH	CHK: T-20	
FOUNDED: M.S.		1/20

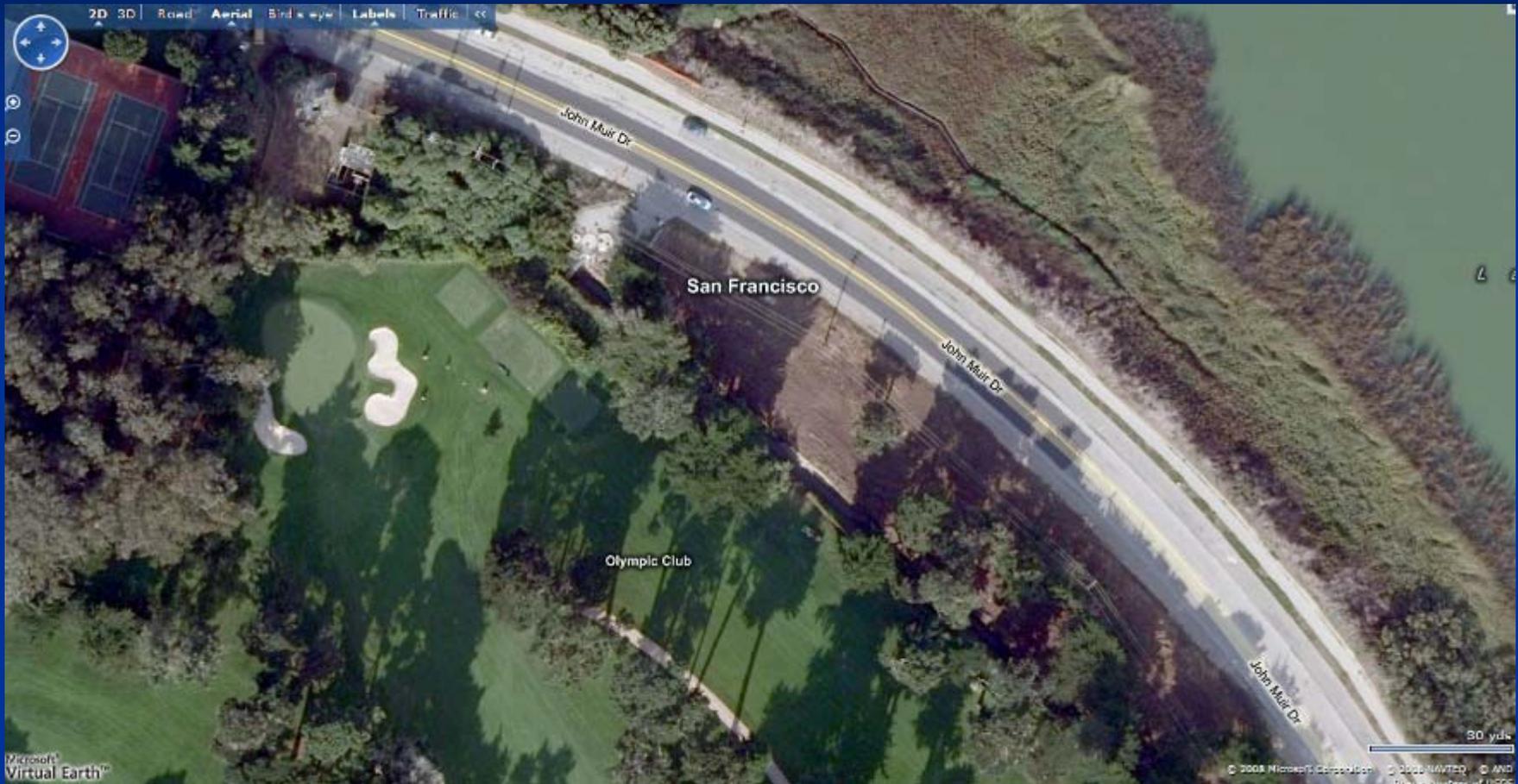
Alternate 5B Staging Area



Alternate 6 Staging Area



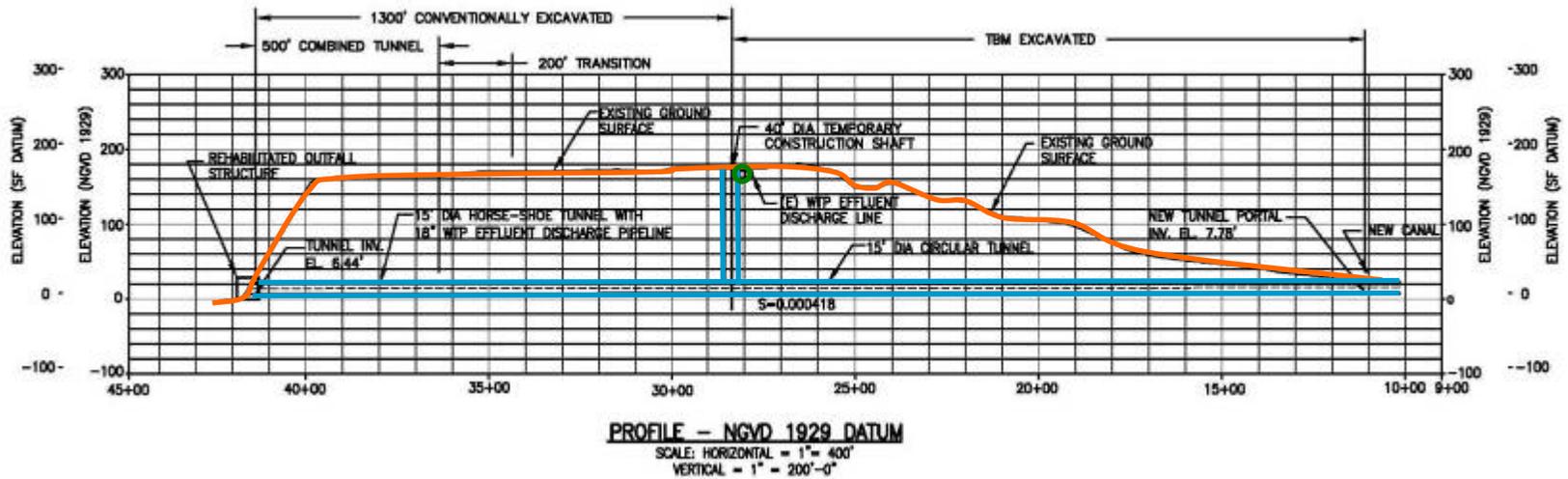
Alternate 7 Staging Area



Alternative Staging Area



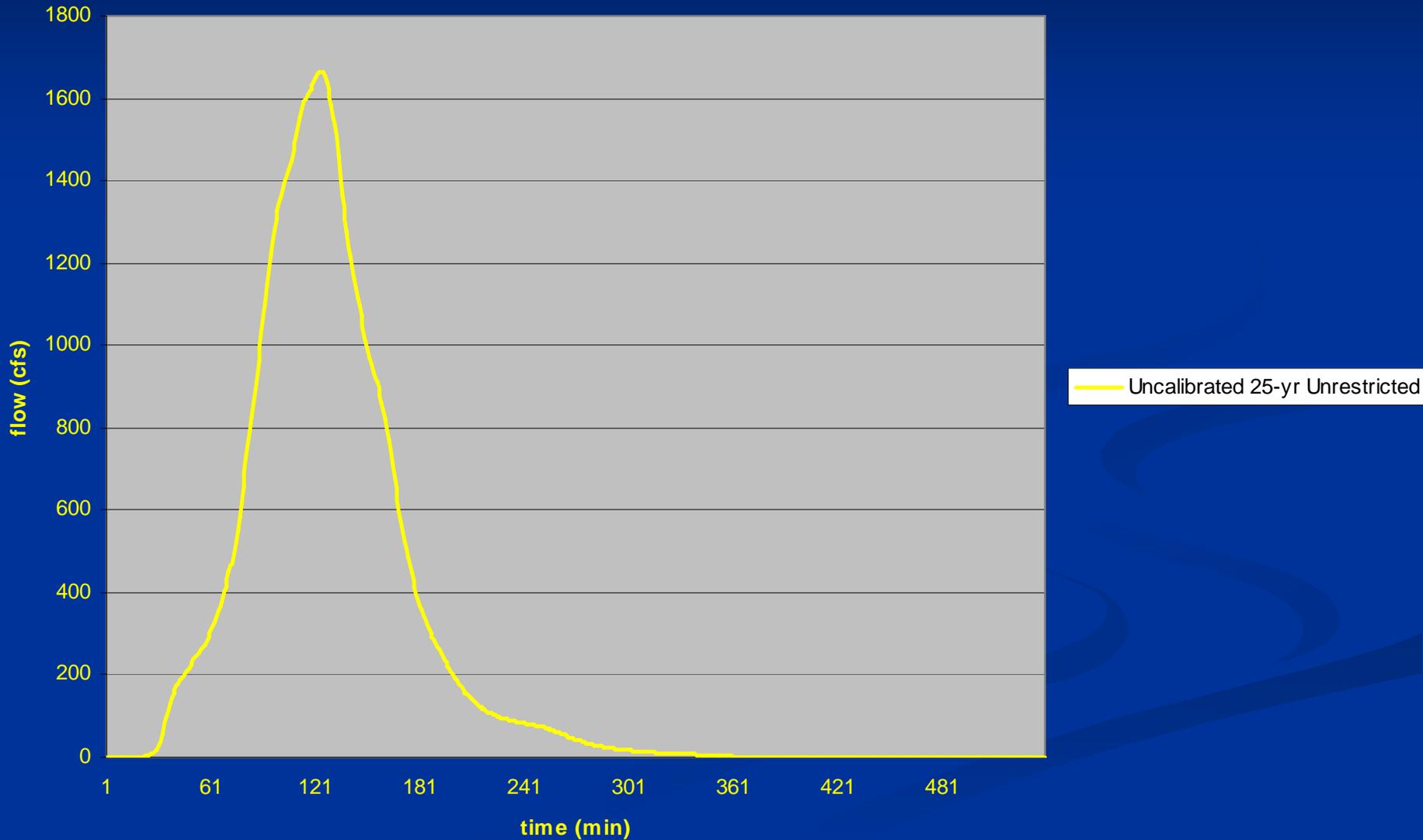
Alternate Staging Area (Cont.)



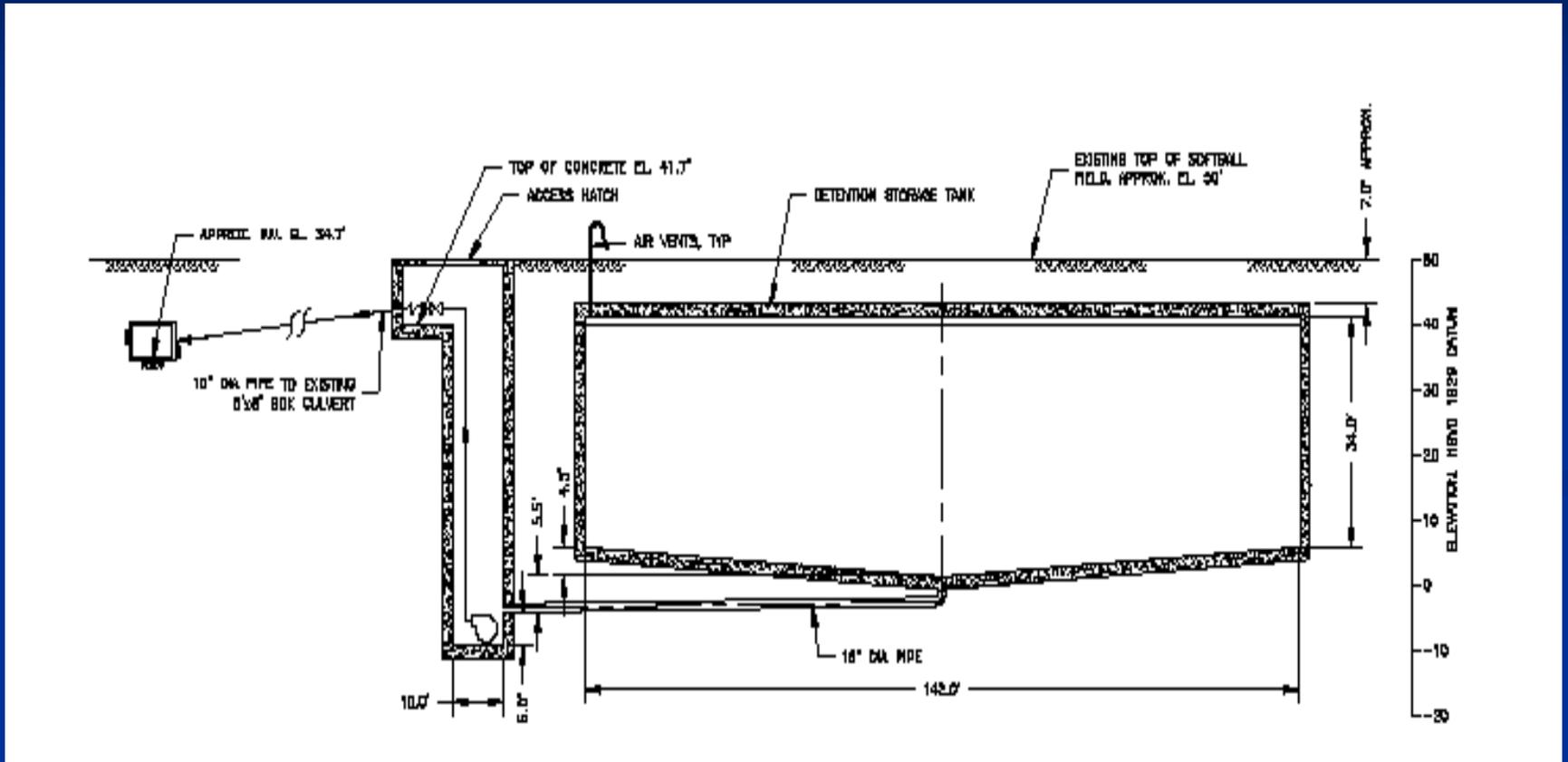
Westlake Park Detention Basin



Hydraulic Update (Cont.)



Westlake Park Detention Basin

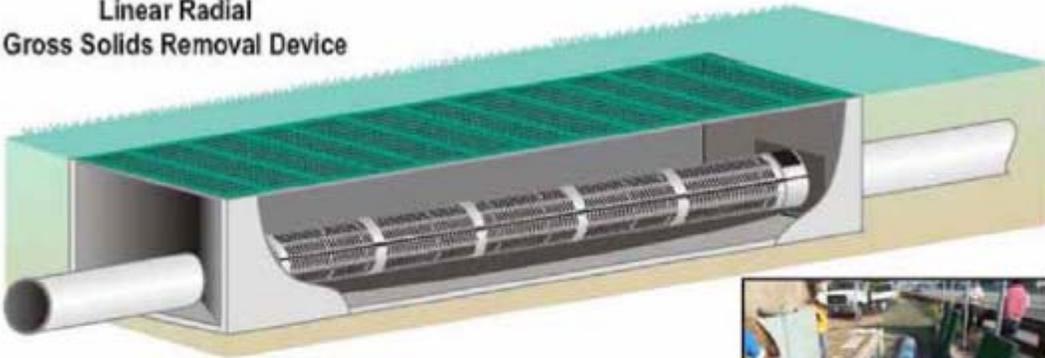


- Maintenance expectations:
 - Routinely maintain pump station and auxiliary equipment
 - Annually wash-down of basin at the end of the wet season to remove sediment

Debris Screening at Detention Basin

- Located beneath Westlake Park
 - Prevents debris flowing into basin and clogging pumps.

Linear Radial
Gross Solids Removal Device



This GSRD utilizes a modular well-casing with 5 mm x 64 mm (0.2 in x 2.5 in nominal) louvers to screen out gross solids. The modular well-casing is placed on a 2 percent slope. Runoff flows into the device and exits radially through the louvers.

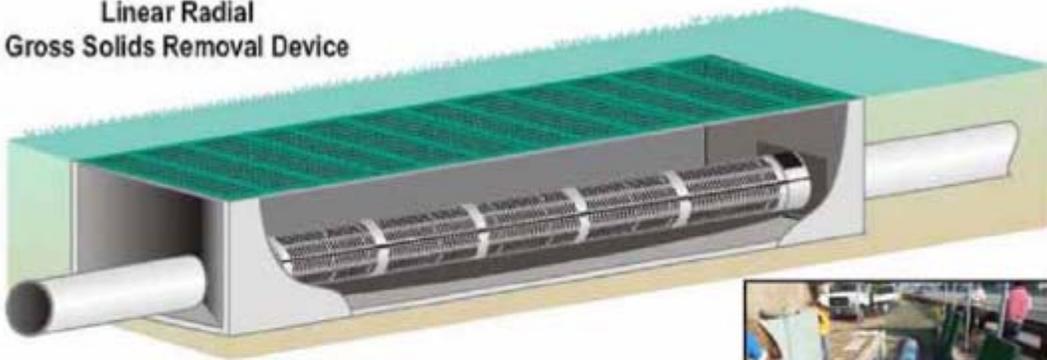


- Maintenance expectations:
 - Remove debris from screen with vacuum truck following the first flush and storms requiring storage
 - Annual wash-down of basin at the end of the wet season to remove sediment
 - Reduced debris and trash cleanup requirements on beach

Debris Screening at Canal Inlet

- Located west of the intersection at John Muir Dr. and Lake Merced Blvd.
 - Prevents debris from flowing into both tunnels (new and existing).

Linear Radial
Gross Solids Removal Device



This GSRD utilizes a modular well-casing with 5 mm x 64 mm (0.2 in x 2.5 in nominal) louvers to screen out gross solids. The modular well-casing is placed on a 2 percent slope. Runoff flows into the device and exits radially through the louvers.



- Maintenance expectations:
 - Remove debris from screen with vacuum truck following first flush and periodically throughout the wet season
 - Reduced debris and trash cleanup requirements on beach

Debris Screening at Existing Tunnel Inlet

- Located at end of Canal
 - Prevents debris flowing into the existing tunnel and out to the beach.
 - Depending on the selected alternative, the existing bar screen may require upgrades.



- Maintenance expectations:
 - Remove and collect accumulated debris from screen following first flush and periodically throughout the wet season
 - Reduced debris and trash cleanup requirements on beach

Discussion with Regulatory Agencies

- Continued discussions with GGNRA for use of Fort Funston for staging area
 - Formal request for legal description of existing row/easements
 - Beach sand replenishment not favorably received
 - Staging on public lands vs. private property
 - Absence of federal clearinghouse
 - Status of funding (total project and local reimbursement)
- Continued discussions with Coastal Commission staff
 - Will be last to respond

Environmental Planning

- CEQA/NEPA
 - EIR/EIS
- Golden Gate National Recreation Area
 - Special Use Permit
 - Right-of-way Permit
- State Lands Commission
 - General Lease ROW
- Regional Water Quality Control Board (up to 2 permits required)
- Army Corps of Engineers (up to 2 permits required)
- Coastal Commission
 - Coastal Development Permit
 - City and County of SF Local Coastal Program
 - Daly City Local Coastal Program
 - San Mateo County Local Coastal Program (may not be required)
 - Public Works Plan
 - Federal Consistency Certification
- Development of environmental workbook (75% complete)

Alternative Selection

- Alternative staging area allows for reduced construction impact
 - Smaller ocean construction work area
 - Maintaining greater public beach access
 - Reduced traffic impact
 - Reduced potential habitat impact
 - Reduced flow bypass requirements
- Estimated construction costs are within 20% of each alternative
- Alternative scoring methodology does not conclusively differentiate one alignment over another

Budgetary Cost Estimates

■ Tunnel Staging from Canal

■ Alternative 5B	\$201,517,000
■ Alternative 6	\$209,815,000
■ Alternative 7	\$219,412,000

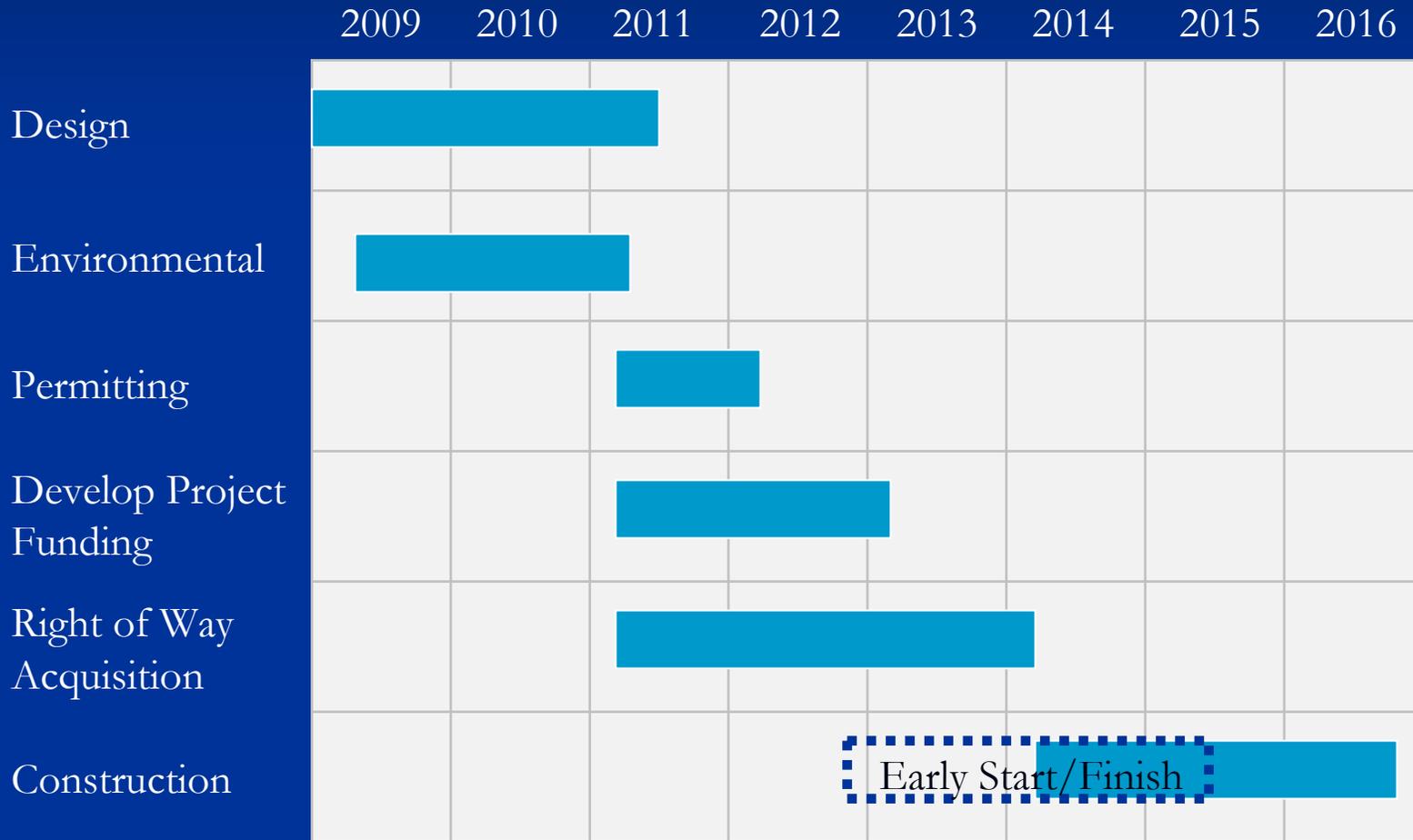
■ Tunnel Staging from Ft. Funston

■ Alternative 5B	\$180,228,000
■ Alternative 6	\$189,492,000
■ Alternative 7	\$202,042,000

Estimated Project Timeline

- Design (concurrent with environmental)
18 months – 30 months
- Environmental compliance (CEQA/NEPA)
12 months – 24 months
- Permitting
12 months
- Develop Project Funding (concurrent with permitting)
18 months – 24 months
- Right-of-Way Acquisition (concurrent with permitting)
12 months - 36 months
- Construction
24 months - 30 months

Estimated Project Timeline



Next Steps

- Public Input
 - Draft Alternatives Evaluation Report and Supplemental Analyses are available on-line at www.dalycity.org
 - Comments accepted through October 17, 2008
- Staff continued development of top alternatives and permitting workbook and completion of the Hydraulic Evaluation Report and outline of upstream improvements
- Report to the Board on public input and draft final alternative(s) recommendations (November 2008)

Next Steps (Cont.)

- Board to conduct a public hearing to accept documents, select final design storm and alignment for final design and environmental review (November 2008)
- Initiation of design and environmental assessment
- Outline right-of-way requirements and initiate discussions

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