



Peninsula Beach Sand Management Feasibility Study



Presented to Marine Advisory Commission

Presented by Jack Malone

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Program Overview

- Evaluate current and past sand management practices and develop alternatives to better meet City and public needs
- Focus on:
 - Storm protection
 - Recreational uses
 - Reducing truck traffic and noise
 - Restoring water views
 - Cost management

Study Location



Technical Approach

- Review past studies to see what has been tried before and look for innovative solutions
- Develop hydrodynamic model of study area to better understand site
- Determine optimal beach width and profile
- Evaluate range of management alternatives
- Focus on implementability and long-term effectiveness of solution

Alternatives Considered

- Existing practices – relocate sand from west beach using front-loaders and trucks to east beach
- Alternative 1 – same approach as existing except relocate sand using hydraulic system instead of trucks
- Alternative 2 – same approach as Alternative 1 except first create wider beach using sediment dredged from Alamitos Bay entrance channel
- Alternative 3 – same approach as Alternative 2 except add physical structure to reduce shoreline erosion

Current Operations – Mechanical Backpassing

Current Operations

- Conducted up to 5 days per week
- Significant residential impacts
- Loss of recreational uses
- Costs more than \$550K per year
- Successfully protects residences







Alternative 1 – Hydraulic Backpassing

Hydraulic Backpassing

- Use hydraulic pump to transport sand to placement area
- Eliminates truck traffic and noise
- Commercially available equipment
- Can be rapidly deployed when needed
- More cost effective after initial capital investment



Hydraulic Backpassing

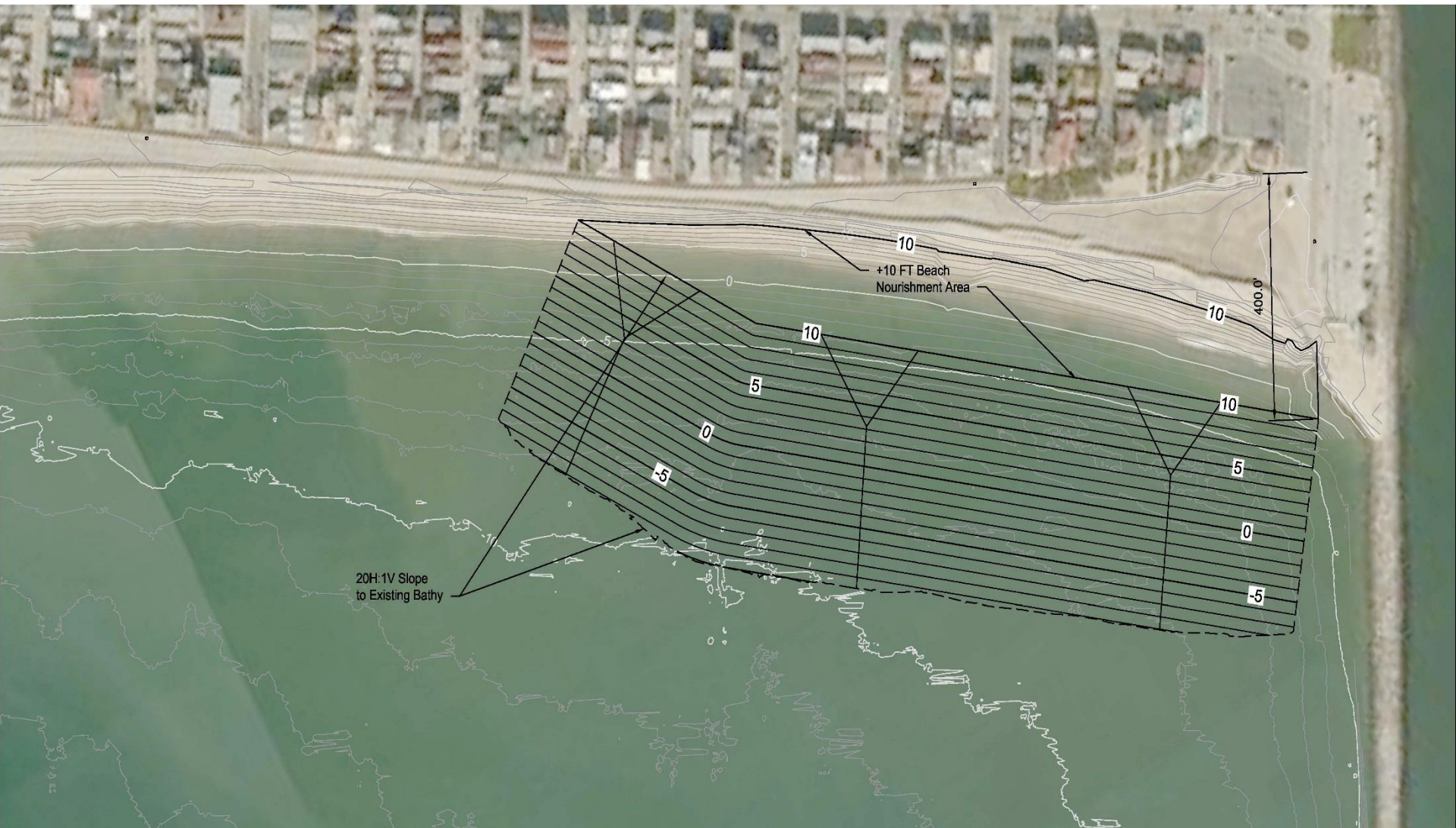


Alternative 2 – Hydraulic Backpassing with Initial Beach Fill

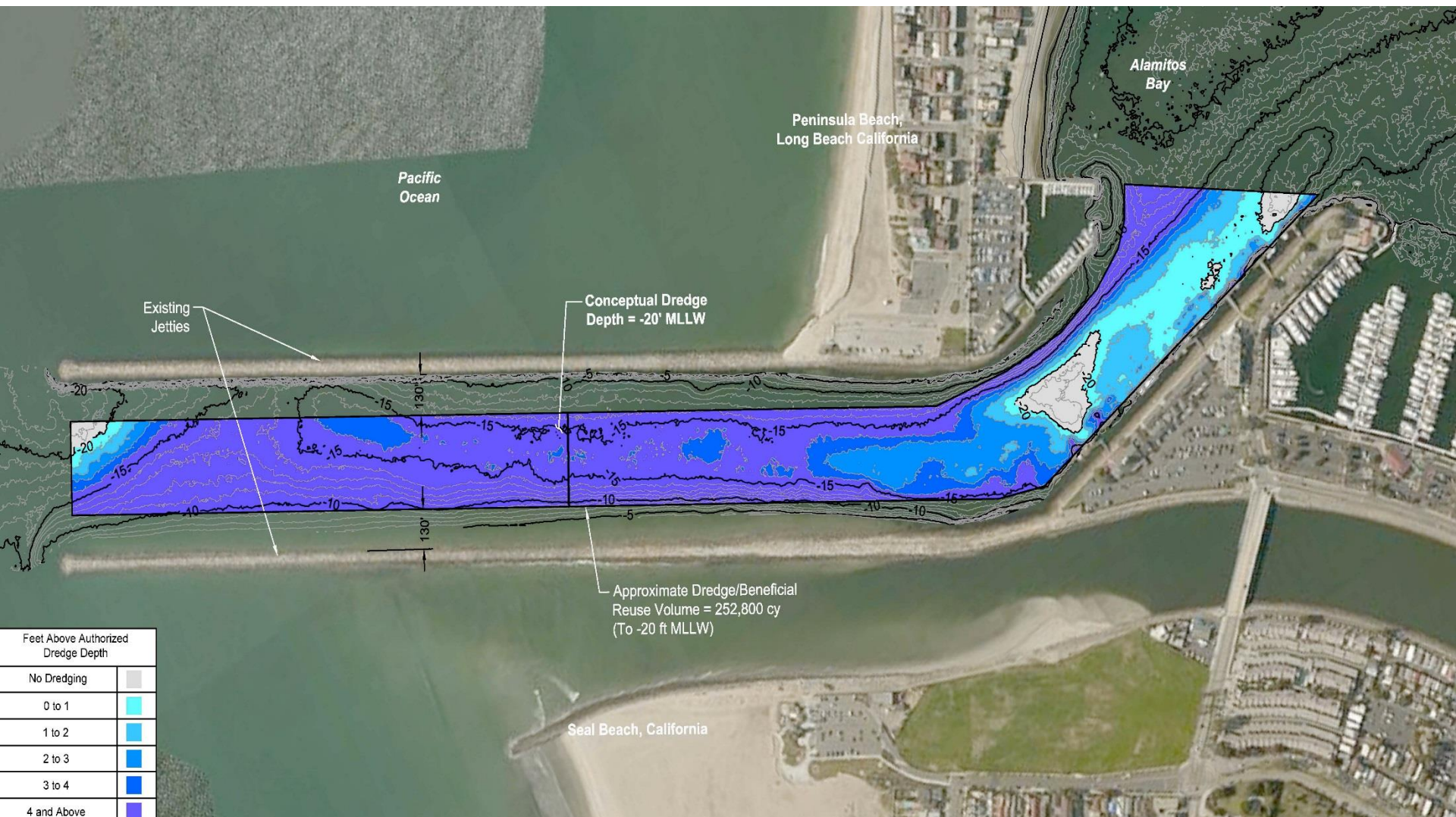
Hydraulic Backpassing with Initial Beach Fill

- Start with wider beach using entrance channel sand or other available sand
- Construct 200-foot-wide beach with gentle (20:1) slope similar to western end of beach
- Erosion and westward sand transport will continue
- Maintain outer edge of beach slope using hydraulic pump
- Provides shoreline protection and restores beneficial uses to beach

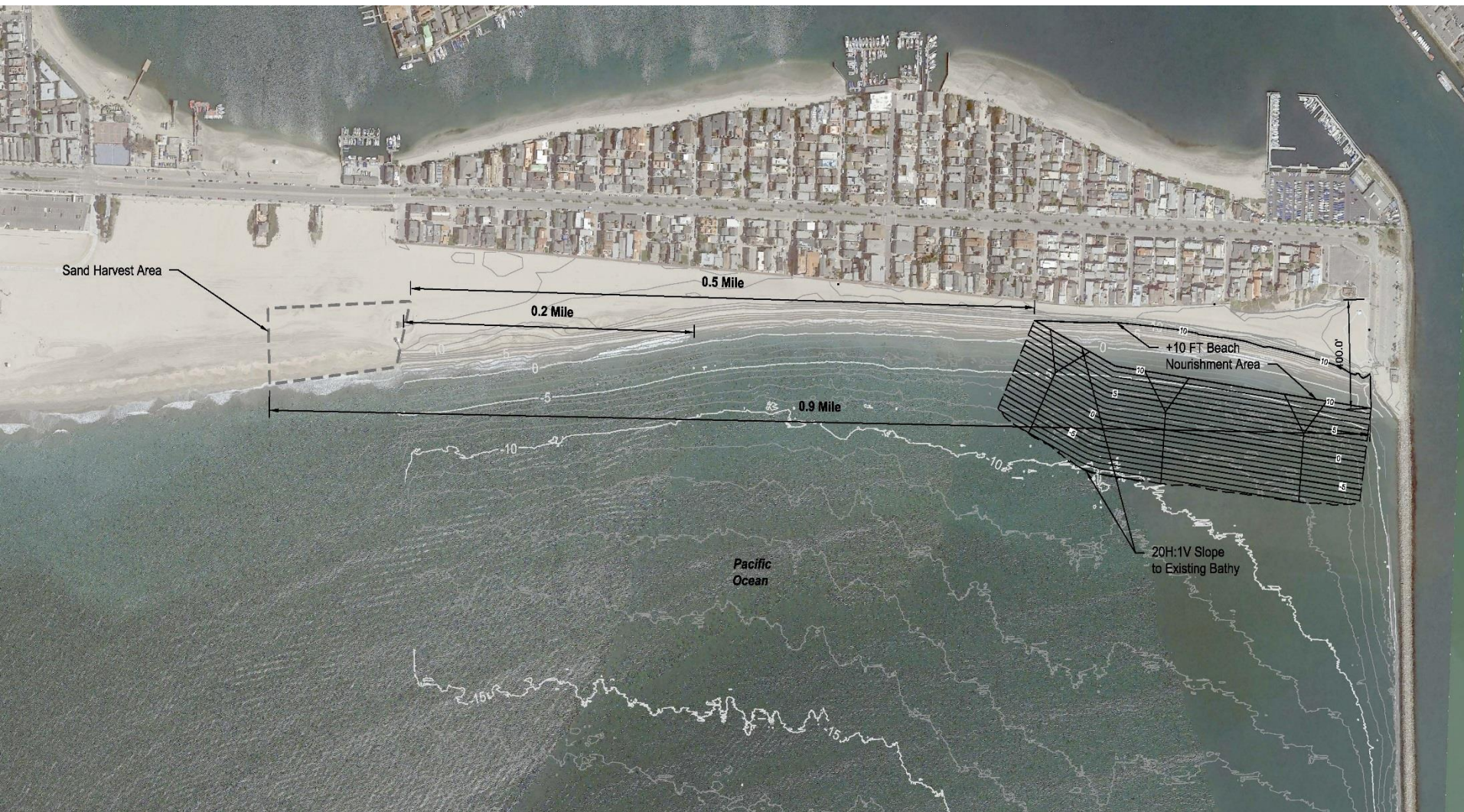
Target Beach Fill Area



Available Sediment for Beach Fill

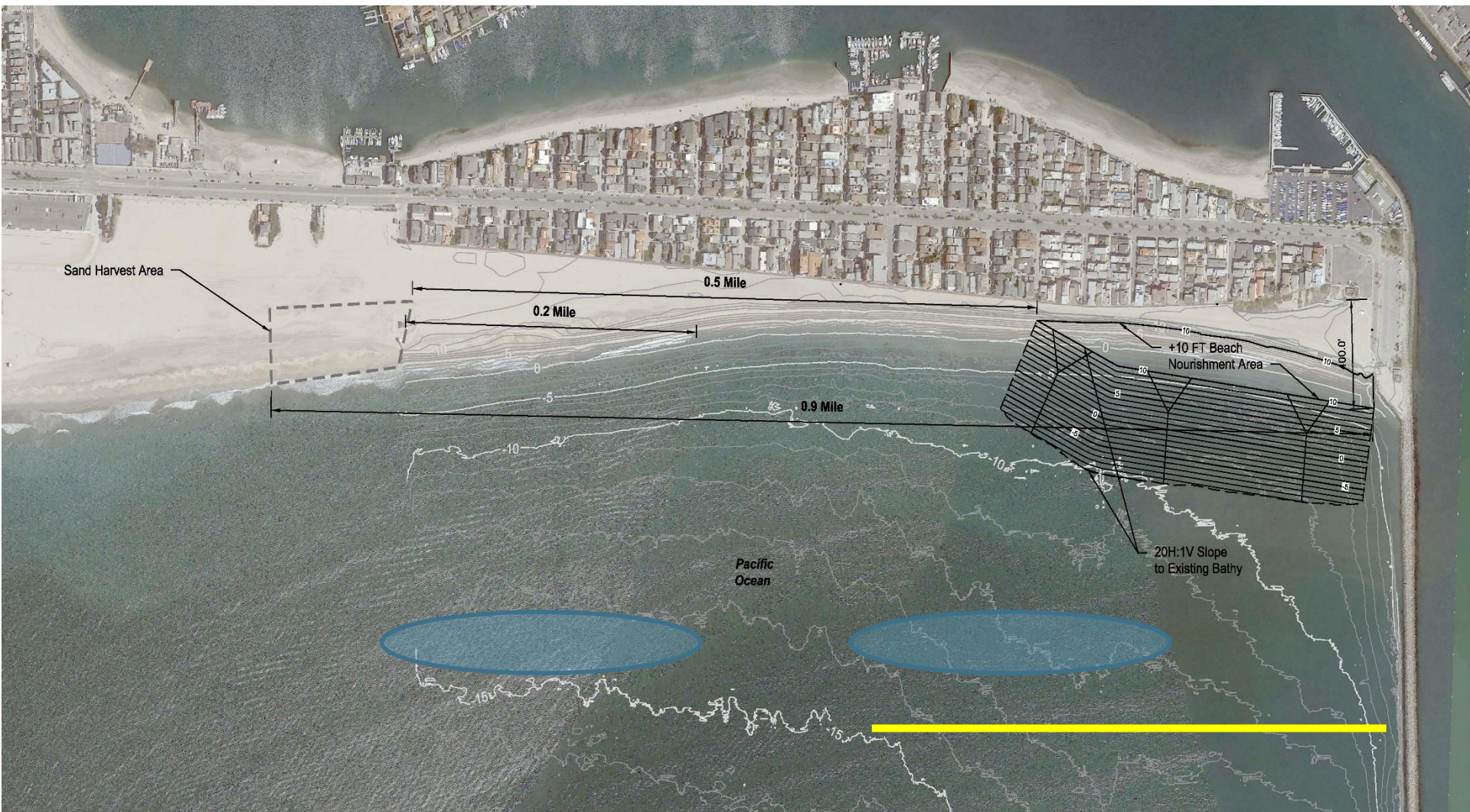


Alternative 2 Overall Approach



Alternative 3 – Hydraulic Backpassing with Initial Beach Fill and Physical Structure

Alternative 3 Potential Physical Structures



Cost Summary for Year 1

| Cost Item | Current – Mechanical Backpassing | Alternative 1 – Hydraulic Backpassing | Alternative 2 – Hydraulic Backpassing with Initial Nourishment | Alternative 3 – Same as Alternative 2 with Structural Features Added |
|---------------------------|---|--|---|---|
| Capital Expenditures | -- | \$555,000 | \$555,000 | \$555,555 |
| Rental Equipment | \$300,000 | -- | -- | -- |
| Annual Maintenance | \$30,000 | \$10,000 | \$10,000 | \$10,000 |
| Annual Labor to Operate | \$250,000 | \$125,000 | \$125,000 | \$125,000 |
| Other O&M (dredging) | -- | -- | \$4,050,000 | \$4,050,000 |
| Other Capital Improvement | -- | -- | -- | \$12,500,000 |
| Design/Permitting | -- | -- | \$300,000 | \$400,000 |
| Total | \$580,000 | \$690,000 | \$5,040,000 | \$17,640,555 |

Cost Summary for Subsequent Years

| Cost Item | Current – Mechanical Backpassing | Alternative 1 – Hydraulic Backpassing | Alternative 2 – Hydraulic Backpassing with Initial Nourishment | Alternative 3 – Same as Alternative 2 with Structural Features Added |
|---------------------------|----------------------------------|---------------------------------------|--|--|
| Capital Expenditures | -- | -- | -- | -- |
| Rental Equipment | \$300,000 | -- | -- | -- |
| Annual Maintenance | \$30,000 | \$10,000 | \$10,000 | \$10,000 |
| Annual Labor to Operate | \$250,000 | \$125,000 | \$125,000 | \$125,000 |
| Other O&M (dredging) | -- | -- | -- | -- |
| Other Capital Improvement | -- | -- | -- | -- |
| Design/Permitting | -- | -- | -- | -- |
| Total | \$580,000 | \$135,000 | \$135,000 | \$135,000 |

Next Steps

- Purchase equipment for pilot study to test pumping efficiency
- Fine tune hydraulic pumping system and add equipment as necessary
- Begin transition from mechanical to hydraulic backpassing management approach

Questions/Discussion

