

**ASSEMBLY STANDING COMMITTEE  
COMMITTEE OF THE WHOLE  
THE CITY AND BOROUGH OF JUNEAU, ALASKA**  
March 23, 2015, 6:00 PM.  
City Hall Assembly Chambers

Worksession - No Public Testimony

- I. ROLL CALL**
- II. APPROVAL OF AGENDA**
- III. APPROVAL OF MINUTES**
  - A. March 2, 2015 - Committee of the Whole Meeting Minutes**
- IV. AGENDA TOPICS**
  - A. Biosolids Update**
  - B. West Douglas Road**
  - C. Whale Sculpture / Seawalk Project Update**
- V. ADJOURNMENT**

ADA accommodations available upon request: Please contact the Clerk's office 72 hours prior to any meeting so arrangements can be made to have a sign language interpreter present or an audiotape containing the Assembly's agenda made available. The Clerk's office telephone number is 586-5278, TDD 586-5351, e-mail: [city.clerk@juneau.org](mailto:city.clerk@juneau.org)

**ASSEMBLY AGENDA/MANAGER'S REPORT  
THE CITY AND BOROUGH OF JUNEAU, ALASKA**

March 2, 2015 - Committee of the Whole Meeting Minutes

**ATTACHMENTS:**

| Description                                         | Upload Date | Type    |
|-----------------------------------------------------|-------------|---------|
| <input type="checkbox"/> DRAFT COW Minutes 3/2/2015 | 3/13/2015   | Minutes |

# ***DRAFT***

## **ASSEMBLY STANDING COMMITTEE COMMITTEE OF THE WHOLE THE CITY AND BOROUGH OF JUNEAU, ALASKA MINUTES**

March 2, 2015, 6:00 PM.  
City Hall Assembly Chambers

Assembly Worksession - No Public Testimony - Meeting to begin immediately after Special Assembly Meeting at 6 p.m.

### **I. ROLL CALL**

Deputy Mayor Mary Becker called the meeting to order at 6:10 p.m. in the Assembly Chambers.

Assemblymembers Present: Mary Becker, Karen Crane, Maria Gladziszewski, Loren Jones, Jesse Kiehl, Jerry Nankervis, Merrill Sanford, and Debbie White.

Assemblymembers Absent: Kate Troll.

School Board Members Present: Phyllis Carlson, President; Destiny Sargent, Andy Story, Brian Holst, Lisa Worl, Sean O'Brien.

School Board Members Absent: Barbara Thurston.

Staff present: Kim Kiefer, City Manager; Amy Mead, City Attorney, Rob Steedle, Deputy City Manager; Laurie Sica, Municipal Clerk; Mark Miller, JSD Superintendent; David Means, JSD Administrative Services Director; Bob Bartholomew, Finance Director; Hal Hart, Community Development Director; Greg Chaney, Lands and Resources Manager.

### **II. APPROVAL OF AGENDA**

Hearing no objections or changes, the agenda was approved.

### **III. APPROVAL OF MINUTES**

#### **A. February 9, 2015 - Committee of the Whole Meeting Minutes**

Hearing no objection, the minutes of the February 9, 2015 Assembly Committee of the Whole were approved.

### **IV. AGENDA TOPICS**

#### **A. Discussion with JSD School Board on Budget**

Phyllis Carlson, Board Chair, said the Board appreciated all of the past support to the School District and they were present on behalf of the students of the community, the future. This is a highly educated community and should have a world class school district. They focused on improvements while working had to cut \$11 million and 120 staff members from the district, which had a great impact on instructional abilities, while implementing higher educational standards. JSD was upgrading buildings and technology. She spoke about educational goals and equity issues. She asked the Assembly to continue to prioritize education, fund to the cap, support activities and the Board understood the budget challenges faced by the Assembly as well.

Superintendent Miller provided a presentation on the proposed school budget under review. He said projected expenses exceeded projected revenues by \$2.2 million. He said many cuts had already been made to the budget, and any further cuts would be even more difficult. He spoke about improved graduation rates, which was a primary goal. He was impressed that Title 1 Schools, which housed those most in need socio-economically, were succeeding. He said the Board was asking for

# ***DRAFT***

funding to the cap, and for some activities funding, and he understood that was a very "hard ask." He said there was no fat in the budget and spoke about class sizes, and the budget goes to paying teachers in classrooms. The only real way to reduce costs is to reduce teachers and increase class sizes.

He explained cuts that had been made and said if the district got full funding from the state and restoration from last year, there was still a deficit of \$1.4 million. The activities expenses were \$140,000 over anticipated and that would have to stop. He explained potential budget reduction scenarios that included varying components such as establishing an activities fee, reducing activities, and increasing class sizes.

Ms. Becker asked how reducing middle school activities would effect participation in high school. Mr. Miller said activities were a major factor in keeping students motivated and in school.

Ms. White said there used to be an activities fee and asked about if the fee had gone away. She spoke about the personal fundraising. Mr. Means said there was an activities fee of \$60 - 75 per student (from students) that was discontinued in 2008-2009 as an equity issue. Ms. Sargent and Ms. Story spoke about the community committees that worked on the activities issue when the second high school was opened, and Ms. Story said she would send the background on how the decisions were made.

Mr. Miller outlined the meeting calendar which showed the public participation involved and their plan to bring information forward to the Assembly.

Mr. Jones asked about the public comments in the packet and in general. Mr. Miller said there were pages and pages of comments, and a joint meeting of all of the site councils was held, there were facilitated discussion groups, and the comments in the packet were a summary of the comments received. In response to one of the public comments, he said shutting down Thunder Mountain High School does not save money and in the long term would cost money, so some suggestions were not practical.

Mr. Nankervis asked how other school districts in the state handling the budget issues. Mr. Miller said he had conversations with the other large school districts. He learned that there is Anchorage and there is everyone else. Anchorage thought they would be running a deficit, but were running at a \$22 million surplus, and would be able to absorb a one time hit. The rest were hurting. Matsu was growing, which helped their financial situation. Fairbanks was looking at major increases in pupil-teacher ratio (PTR). Everyone was looking at increases to PTR, with the exception of Anchorage. Fairbanks and Kenai were losing some students, similar to Juneau.

Mr. Jones asked about the financial effect of Montessori becoming its own school and Mr. Miller said it was a small benefit financially, approximately \$150,000 in savings.

Mr. Jones asked about combining grades in classrooms. Mr. Miller said those decisions were made by the school site. More students were assigned per grade in PTR. He explained different scenarios for class sizes.

Mr. Holst thanked the Assembly and the community for the strong support for education. There had been a slow steady increase in the rest of the spending in CBJ and the actual dollar amount spent for schools was \$1.3 million lower than it was a few years ago. He understood the need for cost cutting, but asked the Assembly to consider whether a disproportional cut to the schools was made.

Mayor Sanford said due to the amount of students in school, there were fewer dollars from the state, and at the CBJ level, so everyone was cutting spending. If the Assembly could prioritize the school alone, that would be easier than the way things are with competing needs.

Ms. Becker said she would like to see an additional amount of money to the school district based on the \$500,000 we did not give them last year, and if we cut even more this year, it would be so difficult

# ***DRAFT***

to catch up. She wanted to consider a supplemental funding scenario for this year.

Ms. Crane said that would be just that much more money that would be in the deficit next year.

Mr. Jones said Ms. Becker could support a mill increase.

Mr. O'Brien said there were not a significant number of fewer students, but it was more an issue of increased costs - such as cost of living, wage increases, etc. The lower student numbers was small. Mayor Sanford said it was still 600 students fewer than ten years ago.

Mr. Jones said even though there were students lost, there was an increase in kindergarten enrollment, and he asked about enrollment and private schools. Ms. Story said she would provide a report on enrollment from Greg Erickson which included information on school choice.

Mr. O'Brien said it was important to look at the total student body level vs. specific grades. Ms. Story said that it was job loss creating student loss and Mr. Kiehl said that was backed up.

There was general discussion about local students participating in alternative programs.

Mr. Nankervis said that the Assembly was trying to make it more appealing to live here through the economic plan and efforts towards affordable housing. Ms. Story said that parents made decisions about living in Juneau based on quality of schools and class sizes.

Ms. Worl said that the legislature asks during testimony on the school budget if a community supports to the cap. Graduation rates had increased, despite cuts, and that was significant. It was difficult to cut programs that are known to be working to increase the graduation rate.

Ms. Story said the state had flat funded for the past several years and it had been difficult.

Ms. Becker thanked the School Board for their attendance, participation and work. Mr. Miller acknowledged the work and the difficult decisions that the Assembly had to make.

Mr. Jones said he needed to know how much the funding would be to fund to the cap. He knew there were a lot of factors including what the legislature did and what the property assessments would be, so the sooner he knew the number of what the cap was and what the difference was, the better he would be able to assist.

## **B. Update on Senior Assisted Living**

Sioux Douglas, the President of Senior Citizens Support Services, Inc., a non-profit organization that built Fireweed Place was present to speak to the Assembly. Also present was Marie Darlin, one of the original board members. Brian Holst, Amy Volz and Jim Scholl were present and had served on the task force to bring assisted living to Juneau. CBJ helped to fund the market demand study, which was linked from the JEDC website and a narrative about the study was included in committee packet. She said that Alaska has the fastest growing aging population of senior in the United States. There is a silver tsunami and we are trying to catch up and provide assisted living for seniors where none exists. We started as a task force of volunteers, now with SCSSI, and have done the demand study. We are approaching the pre-development stage. Many seniors prefer to stay in Juneau, in their homes, and that is not always possible as some homes are not adaptable, and many seniors were needing to leave families to find care. It was the right thing to do to keep seniors here, including the positive economic impact upon the community. The Juneau Economic Plan sites the benefit of keeping seniors in the community, including their wealth, contributions, wisdom and input into the community. Agnew Beck Consulting Firm in Anchorage partnered with Northern Economics and put together a good assessment of the needs. We need 56 beds today, and the numbers are projected out to year 2042. The Pioneer Home could only add 15 beds and that would not put a dent in the need. We can use the study to legitimize the need we know exists and to find investors. We are working hard to get conceptual drawings. The preferred model is a campus model, and if there

# ***DRAFT***

were enough property they suggest building an 80 bed facility, which provides basic daily assistance, including memory care. She spoke about including a new non-profit center (SAIL) on the campus for an economy of scale. A continuum of need is very common. They were not focusing on skilled nursing at this time. She spoke about the other amenities that would be on the campus, including a senior center, an on-site lab for UAS CNA training, a hair salon, etc.

The next steps were more feasibility and real pre-development tasks. They were looking at a pre-development program that would provide funding for those tasks. They need to acquire land, and would like to discuss this with the Assembly. The criteria on our matrix of needs for land included ownership, access, location, size, topography, bus, utilities within 200 feet, room for expansion, near fitness/shopping/pharmacy, hazards noted, site prep, natural light, drainage, wetlands, 15 minutes within emergency care, impacts to surrounding properties and zoning issues.

CBJ could help with the land. They needed to understand if CBJ could provide buildable land as a gift/trade/discount for purchase and they were getting to the point where this needed to be settled. There would always be a need for small assisted living homes and they want to encourage ways to incentivize people to be in that business. People in the Borough could do more to turn their homes into homes for elder care. More intensive in-home home care needed to be created as well. CBJ could advertise that this was a need and provide assistance to potential operators to apply for AHFC loans for small home operations, business plan assistance, and ways to collaborate with UAS regarding staffing. CBJ could create better liaisons with state agencies for the elderly.

Ms. Douglas spoke in favor of a CBJ housing coordinator. If there was a person on staff focused strictly on housing development and focusing on housing for seniors. CDD had so much going on and was not able to focus. That person could work with local experts to develop data/research into an action plan. Juneau was not unique, and we don't need to reinvent the wheel. She said CBJ had done a lot to help already and she thanked the staff for the open doors.

Ms. Crane asked if she had ideas of property in the Borough and Ms. Douglas said a favorite piece was not borough land but they are looking of a parcel of 2-4 acres in size.

Mayor Sanford asked if there were any rules or regulations that kept people from being the small mom and pop operations. Ms. Douglas said yes, it was daunting for some to adhere to the regulations, and if you want to be a medicare provider, with some public / some private pay, it is complicated. Mayor Sanford asked if there were any stumbling blocks in the CBJ code. Ms. Douglas said not to her knowledge, but forgiveness of taxes and fees would assist.

Mr. Nankervis asked for a definition of the level of care of assisted living and Ms. Douglas explained. Mr. Nankervis asked if there is so much need, why were there no private firms coming to Juneau to develop the facilities? Ms. Douglas said one firm from Southern California had come to look but they were not used to the cost to build and operate in Alaska as opposed to the lower 48. Because of the economy of scale it was tight to pencil out - but it was possible. Ms. Douglas said the market demand study would help. She encouraged the Assembly to be conveners to facilitate action.

The Assembly asked questions and Ms. Douglas answered. Ms. Becker thanked Ms. Douglas for bringing this information forward to the Assembly.

## **C. North Franklin Parking Lot Proposal**

Mr. Kiehl stepped away from the meeting based on pre-determined conflict of interest.

Mr. Chaney said the CBJ lot was assessed at \$530,000 and there is a proposal to build housing on this lot. Steve Soenksen provided a letter in the packet about a fee simple sale without a reversion clause. Mr. Chaney said staff initially thought it was working with a group of independent investors, but this a group that was seeking financing. The lending institution wanted the collateral if things did not go right. We expected to sell this and have a mix of retail and commercial. If sold without a reversion clause, CBJ would have no control over the outcome of the sale and what would be built on

# ***DRAFT***

the lot, if anything. If the Assembly was comfortable with this he could negotiate a sale. This lot was a valuable community asset functioning as parking right now. The lot was purchased with the intention of building a parking facility on the site, but there were other options. He asked for Assembly direction.

Ms. Gladziszewski asked for background and Mr. Chaney said that Juneau Legacy Properties approached CBJ with a proposal, he brought it to the Assembly, the Assembly asked for other proposals - a solicitation for proposals was issued for a 30 day period but there were no other proposals received.

Mr. Jones spoke about the Baranof's interest in the property and its current use of the property as parking for their business at night. Mr. Chaney said that the Baranof had indicated interest in a purchase of the property.

Ms. Crane said she was not ready to let this property and its future potential uses go. Parking was important to all of downtown and she was not ready to let the parking go.

Ms. White said she spoke with the Law Department and indicated a conflict of interest, and hearing no objection was excused from the meeting.

Mr. Nankervis said he was not interested in letting the lot go without a reversion clause.

Ms. Gladziszewski said the highest need downtown was housing and she spoke in favor of this type of development that would add housing and parking. There were two parking garages downtown now.

Mr. Jones said he would not argue to sell it for this purpose. This is a lot we have control over. He spoke about the Gastineau Apartments, the VFW lots, the soon to be empty First National Bank, and said the city had no control over those. Housing was needed and the city had one piece of property under its control but the discussion continues about a need for parking and there doesn't seem to be the will to move forward. Builders tell us to get public property into private hands and here is an opportunity. He had no problem putting it out to bid to the highest bidder and the purchaser would have control over what they put up.

Ms. Becker was in favor of selling it to the group but was concerned about having no guarantee of housing. Mr. Jones said the only barrier to housing in this case is the Assembly. Selling this can get development, property taxes.

Ms. Gladziszewski asked if there were alternative ways for them to get funding.

Ms. Kiefer said CBJ could put out a request for proposals again.

Ms. Crane said suggested doing so and providing more time to proposers to see what the possibilities were.

Mr. Sanford said the property was being inefficiently used now and supported going out with another solicitation.

Ms. Becker, Ms. Gladziszewski and Mr. Nankervis were all supportive of issuing a request for proposals requesting a housing development.

*MOTION, by Gladziszewski, to ask the lands manage to go back out with a similar proposal for mixed use and housing with a longer timeline.*

Ms. Kiefer suggested that the Lands Committee review the proposal before it goes out. Mr. Chaney suggested an opening of 60 days.

Roll call:

# ***DRAFT***

Aye: Becker, Jones, Gladyszewski, Nankervis, Sanford.  
Nay: Crane  
Abstain: Kiehl, White  
Motion passed, 5 ayes, 1 nay.

Mr. Kiehl and Ms. White rejoined the meeting.

## **V. COMMITTEE MEMBER / LIAISON COMMENTS AND QUESTIONS**

Ms. Crane, Ms. Becker volunteered to serve on the First Lady's committee - March 5 or 6, Noon meeting at governor's mansion.

Mr. Jones suggested sending a representative from the Juneau Human Rights Commission - we need to acknowledge them - at least their chair - to get them involved. Ms. Gladyszewski said she could go this week but could not volunteer for a committee.

## **VI. ADJOURNMENT**

There being no further business to come before the committee, the meeting adjourned at 8:45 p.m.

Submitted by Laurie Sica, Municipal Clerk

**ASSEMBLY AGENDA/MANAGER'S REPORT  
THE CITY AND BOROUGH OF JUNEAU, ALASKA**

Biosolids Update

**ATTACHMENTS:**

| <b>Description</b>                                                               | <b>Upload Date</b> | <b>Type</b> |
|----------------------------------------------------------------------------------|--------------------|-------------|
| <input type="checkbox"/> Biosolids - Centrifuge Analysis                         | 3/16/2015          | Cover Memo  |
| <input type="checkbox"/> Memo re: Biosolids – Sludge Dryer<br>Prevalence in U.S. | 3/9/2015           | Cover Memo  |



City and Borough of Juneau  
Engineering & Public Works Department  
155 South Seward Street  
Juneau, Alaska 99801  
Telephone: 586-0800 Facsimile: 463-2606

---

DATE: 3/6/16

TO: Mary Becker, Chair  
Assembly Committee of the Whole

FROM: Rorie Watt, P.E., Director  
Engineering Department

RE: Biosolids/Centrifuge

The Assembly asked for an analysis of whether a centrifuge would be part of an economical solution. A citizen suggested that a centrifuge could increase our solids concentration and thereby assist in reduction of our operating costs.

Sludge samples were submitted to a major centrifuge manufacturer for bench testing. The attached economic analysis does not favor the purchase and installation of centrifuges.

# Biosolids Treatment and Disposal Evaluation–Phase II

## Biosolids Dewatering Evaluation

PREPARED FOR: City/Borough of Juneau (CBJ), Alaska

PREPARED BY: CH2M HILL

DATE: March 13, 2015

### 1.1 Introduction

Objectives of this Technical Memorandum 6 (TM6) are as follows:

1. To summarize the operating parameters and estimated costs of biosolids dewatering using existing belt filter presses (BFPs) at the CBJ's Mendenhall Wastewater Treatment Plant (MWWTP) and Juneau-Douglas Wastewater Treatment Plant (JDWWTP).
2. To summarize the results of biosolids dewatering bench-scale tests conducted by Andritz (an international dewatering equipment supplier) during December 2014.
3. To summarize the recommendations by Andritz for replacing existing belt filter presses with horizontal solid-bowl centrifuges, including sizing information, generic layouts, and estimated costs.
4. To develop expected capital and O&M cost estimates for the two options described below:
  - a. Continuing to use the existing BFPs for dewatering at both the MWWTP and JDWWTP
  - b. Replacing existing BFPs with centrifuges at the MWWTP and JDWWTP.

Each of these alternatives will be compared assuming that the dewatered cake will be thermally dried by a central biosolids drying facility located at the JDWWTP, using No. 2 fuel oil as the heat source. The cost estimate will provide Budget or Class 4 estimate as defined by the Association for the Advancement of Cost Engineering International (AACEI) which is considered accurate to +50%/-30% based on a 10% concept design.

5. To provide a summary comparison of these two options for CBJ consideration, using a future 20-year period of operations as the basis for comparison.

This TM draws from information provided in TM's 1-5 previously submitted to CBJ.

### 2.1 Solids Loading Projections, Characteristics, and Design Conditions

Based on a review of historical conditions and projections of future conditions for the CBJ, TM 1 and TM 2 presented design solids-loading criteria developed for biosolids management facilities at the (JDWWTP), the Mendenhall WWTP (MWWTP, which includes the Auke Bay WWTP biosolids), and combined loadings from both facilities. The projected loadings are based on historical trends summarized in the Phase 1 report, supplemented by data from calendar year 2013, with the addition of 10% reserve capacity to account for the potential of increased industrial activity and population growth in the future.

Belt filter presses (BFPs) at both WWTPs produced an average of 15.8% total solids (TS) in 2013, but WWTP production records show that dewatered cake solids range from 14% to 17% TS on a day-to-day basis. For sizing of future biosolids handling facilities, it is conservatively assumed that the existing BFP dewatering facilities at both WWTPs will produce 15% TS. Recent tests from a major centrifuge manufacturer resulted in

a prediction of 17% TS from the MWWTP and 19% TS from the JDWWTP by replacing the existing BFPs with using centrifuges. Table 1 below shows the impact on projected daily solids quantities and annual production rates at 15% TS (using existing BFPs), versus achieving 17% TS at the MWWTP and 19% TS at the JDWWTP with centrifuges.

TABLE 1

### General Design Criteria for Purpose of Comparing Biosolids Dewatering Options

| Criterion                      | With Existing BFP's at both WWTPs | With New Centrifuges |                  |                 | Remarks                                                                                                   |
|--------------------------------|-----------------------------------|----------------------|------------------|-----------------|-----------------------------------------------------------------------------------------------------------|
|                                | 15% TS                            | 17% TS at MWWTP      | 19% TS at JDWWTP | Combined Solids |                                                                                                           |
| Average Annual Solids Loading  | 3.4 DT/day                        | 2.6 DT/day           | 0.8 DT/day       | 3.4 DT/day      | Annual average loadings are used for estimating O&M costs                                                 |
|                                | 22.6 WT/day                       | 15.3 WT/day          | 4.2 WT/day       | 19.5 DT/day     |                                                                                                           |
| Maximum Month Solids Loading   | 4.6 DT/day                        | 3.5 DT/day           | 1.1 DT/day       | 4.6 DT/day      | Monthly maximum daily values are used for equipment sizing and estimating capital costs                   |
|                                | 30.7 WT/day                       | 20.6 WT/day          | 5.8 WT/day       | 26.4 WT/day     |                                                                                                           |
| Annual Solids Production Rates | 1,241 DT/year                     | 950 DT/year          | 291 DT/year      | 1,241 DT/year   | Annual totals show the reduction in wet tons (WT) with increasing dry solids concentration by centrifuges |
|                                | 8,273 WT/year                     | 5,588 WT/year        | 1,532 WT/year    | 7,120 WT/year   |                                                                                                           |

## 3.1 Existing Dewatering Process, Performance, and Costs

### 3.1.1 Dewatering Process Descriptions

The MWWTP and JDWWTP use identical BFPs for dewatering waste sludges from the two WWTPs. The BFP used at each WWTP is a Klampress Type KILS model with 1.2 meter (m) belt width, manufactured by Ashbrook-Simon-Hartley, which is now known as Ashbrook. Both BFPs were installed in 1992.

#### 3.1.1.1 MWWTP Dewatering Process

The BFP at the MWWTP dewater sludge that is wasted through waste sludge and thickened sludge tanks after processed through the sequencing batch reactor (SBR) process. The waste sludge at MWWTP typically ranges from 0.5% to 1.0% TS concentration, and it has a relatively high volatile solids (VS) concentration that typically ranges from 85% to 91% of TS concentration.

The BFP at MWWTP operates on average 8 hours per day, 6 days per week. As of late December 2014, the total run time of the BFP at MWWTP since 1992 was 54,912 hours. The polymer currently used at MWWTP

is Northstar EC-1622, an emulsion polymer dosed at 0.75% solution. The estimated unit polymer dose is 30 pounds of active polymer per dry ton of sludge dewatered (lb/DT).

### 3.1.1.2 JDWWTP Dewatering Process

The BFP at the JDWWTP dewateres sludge that is wasted from an aerobic digester that follows an activated sludge process. The waste sludge at JDWWTP typically ranges from 0.7% to 1.2% TS concentration, slightly higher than MWWTP waste sludge TS concentration. Its VS concentration is lower than MWWTP waste sludge and ranges from 75% to 85% of TS concentration, which reflects some VS reduction by aerobic digestion.

The BFP at JDWWTP typically operates 7-8 hours per day for 3-4 days per week, reflecting the lower sludge production at JDWWTP as compared with MWWTP. As of late December 2014, the total run time since 1992 of the BFP at JDWWTP was 38,900 hours. The polymer currently used at JDWWTP is Poly-Hydrofloc 1686 (a water-soluble, dry polymer manufactured by Aqua Ben Corporation), dosed 0.43% solution. The waste sludge at JDWWTP requires less polymer to dewater effectively than is required at the MWWTP. The estimated unit polymer dose at JDWWTP is 20 lb/DT of sludge dewatered.

### 3.1.2 Existing Dewatering Process Operations and Maintenance Costs

The operations and maintenance (O&M) records for the dewatering processes at the MWWTP and JDWWTP were reviewed to estimate the O&M costs of dewatering at each facility. Table 2 summarizes the estimated, annual O&M costs for sludge dewatering at the MWWTP and JDWWTP.

TABLE 2

**Estimated Annual O&M Costs of Current Biosolids Dewatering Processes at MWWTP and JDWWTP**

| <b>Annual Cost Category</b>                                                                      | <b>MWWTP</b>    | <b>JDWWTP</b>   |
|--------------------------------------------------------------------------------------------------|-----------------|-----------------|
| Maintenance Parts & Service                                                                      | \$10,000        | \$8,000         |
| Power*                                                                                           | \$500           | \$200           |
| Polymer                                                                                          | \$85,000        | \$17,500        |
| <b>Total Annual O&amp;M Cost (Excluding Labor)</b>                                               | <b>\$95,500</b> | <b>\$25,700</b> |
| *Power cost estimate is based on average electrical power rate of \$0.09 per kilowatt-hour (kWh) |                 |                 |

Table 2 does not include labor costs for dewatering operations, because centrifuges and BFPs have similar staffing requirements and associated labor costs. Maintenance, power, and polymer costs for alternative dewatering processes would differ, however.

Maintenance costs for dewatering operations are based on both major maintenance (parts replacement, rebuilding, etc.) and minor maintenance (lubrication, fluid and filter replacement, etc.), averaged over the entire 22 years of operations for the BFPs at each facility. Polymer costs assume a dosage rate of 30 lb/DT at the MWWTP and 20 lb/DT at the JDWWTP. The estimated annual cost for polymer at JDWWTP is about 20% of the estimated annual cost for polymer at the MWWTP.

Complete replacement of the BFPs is not anticipated for the next 20-year period, because the technology remains viable and the manufacturer still manufactures all replacement parts. Future maintenance frequency and costs would likely increase somewhat due to the age of the equipment, however. For planning and comparison purposes, it is assumed that maintenance costs for dewatering during the next 20

years will increase by 50% at each facility, above inflation. Annual costs of power and polymer are not assumed to change significantly over the next 20 years aside from general inflation.

Table 3 presents the predicted annual O&M costs for the existing BFPs over the next 20 years.

TABLE 3

**Predicted Annual O&M Costs of Existing Biosolids Dewatering Processes at MWWTP and JDDWTP**

| <b>Annual Cost Category</b>                                                                      | <b>MWWTP</b>     | <b>JDDWTP</b>   | <b>Total</b>     |
|--------------------------------------------------------------------------------------------------|------------------|-----------------|------------------|
| Maintenance Parts & Service                                                                      | \$15,000         | \$12,000        | \$27,000         |
| Power*                                                                                           | \$500            | \$200           | \$700            |
| Polymer                                                                                          | \$100,000        | \$20,000        | \$120,000        |
| <b>Total Annual O&amp;M Cost (Excluding Labor)</b>                                               | <b>\$115,500</b> | <b>\$32,200</b> | <b>\$147,700</b> |
| *Power cost estimate is based on average electrical power rate of \$0.09 per kilowatt-hour (kWh) |                  |                 |                  |

The annual O&M costs summarized in Table 3 will be used in the comparison of operating existing BFPs versus installing and operating new centrifuges at the MWWTP and JDDWTP.

## 4.1 Results of Centrifuge Dewatering Bench-Scale Tests

Samples of feed sludge and dewatered cake were collected from the MWWTP and JDDWTP on December 2, 2014, and shipped overnight to the laboratory of Andritz Separation Technologies (Andritz) in Arlington, TX, arriving there on December 3, 2014. The samples were analyzed for basic constituents pertinent to dewatering, and then the feed sludge samples were tested for dewatering properties based on BFP and centrifuge technologies.

The objectives of bench-scale testing as stated by Andritz were to:

1. Analyze the sludge and cake sample for physical characteristics.
2. Conduct polymer evaluation tests to select the most effective polymer for centrifuge and BFP dewatering.
3. Conduct BFP simulation tests and determine the achievable cake dryness from BFP dewatering.
4. Conduct Centrifuge spin-down tests and determine the anticipated cake dryness from a full-scale centrifuge.

Complete laboratory reports are included in Appendix A. The following subsections summarize the results and conclusions of the dewatering laboratory testing of sludge from each facility.

### 4.1.1 Bench-Scale Dewatering Tests of MWWTP Solids

Five (5) gallons of sludge and cake samples from MWWTP were received in the Andritz laboratory from the City and Borough of Juneau, AK, on December 3, 2014, for dewatering tests simulating a Belt Filter Press (BFP) and a Decanter Centrifuge.

Results of laboratory testing on MWWTP sludges indicated that:

1. The samples from MWWTP were brown in color and emitted earthy odors. The feed sludge sample had a solids content of 0.74%TSS (Total Suspended Solids), the volatiles solids content was 91% of TS (Total Solids), which is high compared to most waste sludges. The Capillary Suction Time (CST) was 47.0

seconds. It had a fine particle size distribution with 79.6% of TSS less than 45 microns. Centrifuge spin-down test conducted on the raw sample at 3000 G's for 5 minutes produced a plug solids content of 5.6%TS.

2. The feed sludge sample was relatively difficult to dewater and require high polymer dosage due to its high organic solids content (fats, oils, grease etc.).
3. Emulsion polymers were more effective in conditioning the sludge and produced higher cake dryness compared to the dry polymers tested. BASF 8868FS was the most effective emulsion polymer tested at  $20 \pm 1$  and  $29 \pm 1$  active lbs/ton TSS for BFP dewatering and centrifuge dewatering, respectively. Therefore, centrifuge dewatering required about 50% more polymer than BFP dewatering.
4. BFP simulation tests conducted on the sludge conditioned with 8868FS at 19.1 active lbs/ton TSS produced a cake dryness of 13.5%TS at 380 lbs/hr DS (100 GPM). The cake produced was thin (5 mm) and spread along the belt. Both sticking and blinding to the cloth were observed.
5. Centrifuge dewatering tests conducted on the sample conditioned with 8868FS at 28.6 active lbs/ton TSS produced a cake dryness of 17 – 19%TS. Ashland 857BS produced a dryness of  $15 \pm 1$  %TS at a dosage of 17.9 active lbs/ton TSS.

The conclusions of bench-scale centrifuge testing were that a cake dryness of 17-19% TS can be anticipated from an Andritz Decanter Centrifuge using emulsion polymers, at a polymer dose rate of approximately 30 lb/DT of sludge processed. Dry polymers for centrifuge dewatering can also improve the achievable cake dryness from the existing BFP dewatering but, the impact is lower compared to emulsion polymers. Therefore, the economic evaluation of this TM assumes that emulsion polymer would be used for centrifuge dewatering of MWWTP feed sludge at a dose rate of 30 lb/DT, with a resulting cake solids concentration of 17% TS.

#### 4.1.2 Bench-Scale Dewatering Tests of JDWWTP Solids

Five (5) gallons of sludge and cake samples from JDWWTP were received in the Andritz laboratory from the City and Borough of Juneau, AK, on December 3, 2014, for dewatering tests simulating a Belt Filter Press (BFP) and a Decanter Centrifuge.

Results of laboratory testing on JDWWTP sludge indicated that:

1. The samples from JDWWTP were brown in color and emitted earthy odors. The feed sludge sample had a solids content of 0.81%TSS (Total Suspended Solids), and the volatiles solids content was 80.5% of TS (Total Solids), which is typical of most waste sludges. The Capillary Suction Time (CST) was 26.0 seconds. It had a fine particle size distribution with 83.4% of TSS less than 45 microns. Centrifuge spin-down test conducted on the raw sample at 3000 G's for 5 minutes produced a plug solids content of 6.1%TS and a clear supernatant.
2. The feed sludge sample from JDWWTP dewatered a little better than MWWTP feed sludge, but it also required a lower feed rate and higher polymer dose than MWWTP feed sludge. This is typical of aerobically digested sludge, in which some of the natural polymers of raw sludge have been broken down and require replacement with synthetic polymers.
3. Emulsion polymers were more effective in conditioning the sludge and produced higher cake dryness compared to the dry polymers tested. Polydyne C9530 was the most effective emulsion polymer tested at  $27 \pm 1$  and  $40 \pm 1$  active lbs/ton TSS for BFP dewatering and centrifuge dewatering, respectively. Therefore, centrifuge dewatering required about 60% more polymer than BFP dewatering.

4. BFP simulation tests conducted on the sludge conditioned with C9530 at 27.7 active lbs/ton TSS produced a cake dryness of 15.9%TS at 365 lbs/hr DS (83 GPM). The cake produced was thin (5 mm) and spread along the belt. Some sticking and blinding to the cloth were observed.
5. Centrifuge dewatering tests conducted on the sample conditioned with C9530 at 40.0 active lbs/ton TSS produced a cake dryness of 19 – 22%TS. Ashland 857BS produced a dryness of 17-19%TS at a dosage of 24.8 active lbs/ton TSS.

The conclusions of bench-scale centrifuge testing on JDWWTP feed sludge were that a cake dryness of 19-22% TS can be anticipated from an Andritz Decanter Centrifuge using emulsion polymers, at a polymer dose of approximately 40 lb/DT of sludge processed. Dry polymers for centrifuge dewatering can also improve the achievable cake dryness from the existing BFP dewatering, but the impact is lower compared to emulsion polymers. Therefore, the economic evaluation of this TM assumes that emulsion polymer would be used for centrifuge dewatering of JDWWTP feed sludge at a dose rate of 40 lbs/DT, with a resulting cake solids concentration of 19% TS.

## 5.1 Recommendations for New Centrifuges and Estimated Costs

Andritz provided recommendations and budget cost estimates for replacing existing BFPs with new centrifuges at the MWWTP and JDWWTP. The Andritz proposals are included in Appendix B. This section summarizes the recommendations and also provides more complete opinions of capital and O&M costs for installing, operating, and maintaining the new centrifuges.

The new centrifuge recommendation for the MWWTP is to install one Andritz D5LX centrifuge, mounted on a skid and complete with sludge feed pump, emulsion polymer feed system, control panel, and inclined screw conveyor for discharging cake into a container. The budget estimate from Andritz for the equipment that they provide is \$485,000. Added to the equipment cost would be the capital costs of building and equipment renovations needed at the MWWTP to accommodate the new centrifuge. With a footprint requirement of about 20 ft. long by 6 ft. wide, the new centrifuge would fit into the available space in the existing building at the MWWTP, but the building foundation underneath the centrifuge would likely need to be strengthened to accommodate the additional weight and vibration of a centrifuge compared with a BFP, and a structural analysis would be required to determine the extent of modifications required. The new centrifuge at MWWTP would operate for 10 hours per day and 5 days per week at maximum-month design loading rates.

The new centrifuge recommendation for the JDWWTP is to install one Andritz D3LL centrifuge, mounted on a skid and complete with sludge feed pump, emulsion polymer feed system, control panel, and inclined screw conveyor for discharging cake into a container. The budget estimate from Andritz for the equipment that they provide is \$360,000. Added to the equipment cost would be the capital costs of building and equipment renovations needed at the JDWWTP to accommodate the new centrifuge. With a footprint requirement of about 18 ft. long by 5 ft. wide, the new centrifuge could potentially fit into the available space in the existing building at the JDWWTP, but the building foundation underneath the centrifuge would likely need to be strengthened to accommodate the additional weight and vibration of a centrifuge compared with a BFP. It is uncertain that the third floor of incineration building where the BFP resides could be strengthened enough to accommodate a centrifuge. The new centrifuge at JDWWTP would operate for 8 hours per day and 5 days per week at maximum-month design loading rates.

Table 4 presents the estimated capital costs of installing new centrifuges at the MWWTP and JDWWTP.

TABLE 4

**Estimated Capital Costs of Installing New Centrifuges at MWWTP and JDWWTP**

| <b>Cost Category</b>                                               | <b>MWWTP</b>       | <b>JDWWTP</b>      |
|--------------------------------------------------------------------|--------------------|--------------------|
| Centrifuge and Associated Equipment from Andritz (described above) | \$485,000          | \$360,000          |
| Building, Foundation, and Mechanical Modifications                 | \$250,000          | \$250,000          |
| Electrical and Controls System Modifications                       | \$73,000           | \$54,000           |
| <b>Estimated Construction Cost</b>                                 | <b>\$808,000</b>   | <b>\$664,000</b>   |
| <b>Markups and Non-Construction Costs</b>                          |                    |                    |
| Contractor Overhead, Mobilization, Bonds, Insurance                | \$121,000          | \$100,000          |
| Contingency                                                        | \$162,000          | \$133,000          |
| Engineering and Permitting                                         | \$113,000          | \$93,000           |
| Construction Services and Startup                                  | \$81,000           | \$67,000           |
| <b>TOTAL ESTIMATED PROJECT COST</b>                                | <b>\$1,285,000</b> | <b>\$1,057,000</b> |

The total capital cost of installing new centrifuges at the MWWTP and JDWWTP is therefore estimated to be **\$2,342,000**.

Table 5 presents the estimated annual costs of operating and maintaining new centrifuges at the MWWTP and JDWWTP.

TABLE 5

**Estimated Annual O&M Costs of New Dewatering Centrifuges at MWWTP and JDWWTP**

| <b>Annual Cost Category</b>                                                                      | <b>MWWTP</b>     | <b>JDWWTP</b>   | <b>Total</b>     |
|--------------------------------------------------------------------------------------------------|------------------|-----------------|------------------|
| Maintenance Parts & Service                                                                      | \$10,000         | \$5,000         | \$15,000         |
| Power*                                                                                           | \$8,400          | \$3,400         | \$11,800         |
| Polymer                                                                                          | \$140,000        | \$58,000        | \$198,000        |
| <b>Total Annual O&amp;M Cost (Excluding Labor)</b>                                               | <b>\$158,400</b> | <b>\$66,400</b> | <b>\$224,800</b> |
| *Power cost estimate is based on average electrical power rate of \$0.09 per kilowatt-hour (kWh) |                  |                 |                  |

As shown above, the estimated costs of maintenance parts and service for new centrifuges at MWWTP and JDWWTP are lower than corresponding, estimated costs for maintaining existing BFPs at those facilities (see Table3). However, the estimated costs for power and polymer are substantially higher for centrifuges than for BFPs. As a result, the annual estimated O&M costs for new centrifuges are higher than for the existing BFPs at both WWTPs.

The following and concluding section of this TM provides a life-cycle cost comparison of continuing to operate the existing BFPs at the MWWTP and JDWWTP, versus installing and operating new centrifuges at those facilities.

## 6.1 Comparison of Installing and Operating New Centrifuges versus Continuing to Operate Existing Belt Filter Presses

The primary advantage of installing and operating new centrifuges at the MWWTP and JWWTP is that they are predicted to produce dewatered cake with higher solids concentrations than the existing BFPs are currently producing. A higher solids content translates directly to lower costs of thermal drying, because drying fuel costs are related directly to the amount of water that needs to be evaporated from the cake biosolids. An increase in solids content afforded by centrifuges also may reduce the size and capital cost of a thermal dryer; however, the dryer capital cost in this case is not reduced, because the amount of water to evaporate does not decrease sufficiently with centrifuges to reduce the size of the dryer.

Table 6 shows the predicted annual savings that would occur with a new centrifuge at the MWWTP producing a dewatered cake of 17% TS, and a new centrifuge at the JWWTP producing a dewatered cake of 19% TS, as predicted by centrifuge manufacturer, Andritz.

TABLE 6

### Estimated Annual Solids Disposal Costs and Savings by Installing New Centrifuges at MWWTP and JWWTP

| Annual Disposal Cost Category                                                            | MWWTP           | JWWTP           | Total            |
|------------------------------------------------------------------------------------------|-----------------|-----------------|------------------|
| Annual Solids Loading at 15% TS in WT                                                    | 6,333           | 1,940           | 8,273            |
| Estimated Drying Fuel Costs at 15% TS                                                    | \$490,600       | \$150,300       | \$640,900        |
| Predicted Solids Loading in WT with 17% TS at MWWTP and 19% TS at JWWTP                  | 5,588           | 1,532           | 7,120            |
| Predicted Drying Fuel Costs with 17% TS at MWWTP and 19% TS at JWWTP                     | \$422,000       | \$112,800       | \$534,800        |
| <b>Predicted Annual Savings in Drying Costs with 17% TS at MWWTP and 19% TS at JWWTP</b> | <b>\$68,600</b> | <b>\$37,500</b> | <b>\$106,100</b> |

The life-cycle cost and savings comparison of installing new centrifuges versus continuing to operate existing BFPs at the MWWTP and JWWTP is shown in Table 7. For purposes of illustrating costs and savings, costs are shown with a minus sign (-) and savings with a plus sign (+).

TABLE 7

**Life-Cycle Cost Comparison of Continuing Operation of Existing BFPs versus Installing New Centrifuges at MWWTP and JDWWTP**

| <b>Cost or Savings Category</b>                                                           | <b>Current BFP Operations</b> | <b>New Centrifuges</b> |
|-------------------------------------------------------------------------------------------|-------------------------------|------------------------|
| Estimated Capital Cost                                                                    | \$0                           | - \$2,342,000          |
| Estimated Annual O&M Cost                                                                 | - \$147,700                   | - \$224,800            |
| Predicted Annual Savings in Drying Costs with New Centrifuges Installed                   | \$0                           | + 106,100              |
| Net Differential in O&M Costs (-) or Savings (+)                                          | - \$147,700                   | - \$118,700            |
| Present Value of Annual O&M Costs or Savings, 3% Annual Discount Rate, 20-year Life Cycle | - \$2,197,300                 | - \$1,765,900          |
| Estimated Life Cycle Cost of Each Alternative                                             | - \$2,197,300                 | - \$4,107,900          |

As shown in Table 7, the predicted life-cycle costs of approximately \$4.1 million by installing new centrifuges at the MWWTP and JDWWTP are about \$1.9 million higher than the predicted life-cycle costs of \$2.2 million for retaining the existing BFPs, under the parameters of evaluation described above. Therefore, it does not appear that installation of new centrifuges to replace existing BFPs is warranted if a thermal drying facility is installed at either WWTP, using No. 2 heating oil for fuel.



City and Borough of Juneau  
Engineering & Public Works Department  
155 South Seward Street  
Juneau, Alaska 99801  
Telephone: 586-0800 Facsimile: 463-2606

---

DATE: 3/5/15

TO: Mary Becker, Chair  
Assembly Committee of the Whole

FROM: Rorie Watt, P.E., Director  
Engineering Department

RE: Biosolids – Sludge Dryer Prevalence in U.S.

At the Assembly COW meeting in January questions were asked about how common sludge drying is the United States. It is a quite common technology. EPA provides many technical fact sheets on wastewater issues (including one on drying). I have provided URLs below.

We have recommended heat drying for a variety of reasons, including the desire to produce a Class A biosolids end product (for ease of disposal), to reduce the quantity of end product and to have a solution that requires a small footprint and doesn't use up scarce lands.

EPA main fact sheet page:  
<http://water.epa.gov/scitech/wastetech/mtbfact.cfm>  
(Then scroll down to Biosolids)

Heat Drying Fact Sheet:  
[http://water.epa.gov/scitech/wastetech/upload/2006\\_10\\_16\\_mtb\\_heat-drying.pdf](http://water.epa.gov/scitech/wastetech/upload/2006_10_16_mtb_heat-drying.pdf)

These links may be of interest to the public or Assembly.

**ASSEMBLY AGENDA/MANAGER'S REPORT  
THE CITY AND BOROUGH OF JUNEAU, ALASKA**

West Douglas Road

**ATTACHMENTS:**

|                          | <b>Description</b>                                      | <b>Upload Date</b> | <b>Type</b> |
|--------------------------|---------------------------------------------------------|--------------------|-------------|
| <input type="checkbox"/> | Rorie Watt Memo re West Douglas Road Permit Application | 3/13/2015          | Cover Memo  |
| <input type="checkbox"/> | West Douglas Wetlands Roads and Preservation Map        | 3/13/2015          | Map         |



City and Borough of Juneau  
Engineering & Public Works Department  
155 South Seward Street  
Juneau, Alaska 99801  
Telephone: 586-0800 Facsimile: 463-2606

DATE: 3/5/15

TO: Mary Becker, Chair  
Assembly Committee of the Whole

FROM: Rorie Watt, P.E., Director   
Engineering Department

RE: West Douglas Road Permit Application

The Army Corps of Engineers (ACOE) requires that we propose mitigation as part of our West Douglas Road permit application.

Typically, the ACOE requires that applicants avoid, minimize and then mitigate for the impacts of their projects. Our project cannot completely avoid all wetlands and streams. Once constructed, the road project will fill approximately 1.5 acres of wetlands and impact 1,600 linear feet of streams. The ACOE generally accepts preservation at a ratio of 3 to 1 to mitigate for fill impacts to high value wetlands.

Given the impacts to high value wetlands and the lack of mitigation opportunities in the Peterson Creek watershed, we propose preservation of approximately 4.5 acres of City land. There are higher value wetlands in the headwaters of Peterson Creek that are appropriate for mitigation/preservation. During the ACOE review process, CBJ will work with the agencies to identify the exact location of the preserved land.

The attached map shows the project area and CBJ lands and conceptually shows the size of a 4.5 acres in comparison.

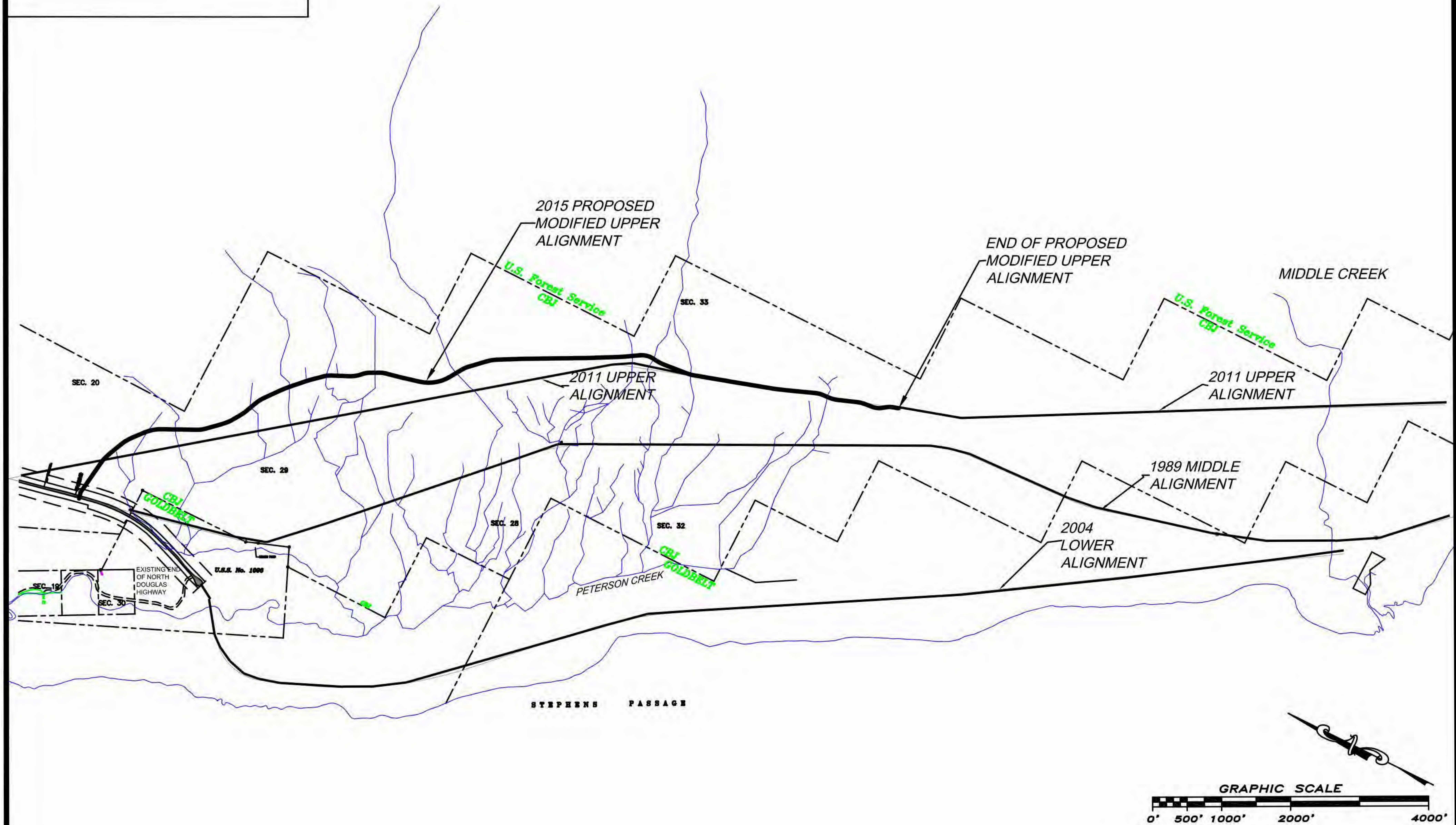
This proposal would permanently encumber CBJ lands in this area and we thought it best to explain the issue to the Assembly prior to submitting the application.

**LEGEND**

- PROPERTY LINE
- ROADWAY ALIGNMENTS
- SHORE LINE
- STREAMS AND DRAINAGES



EXAMPLE OF  
4.5 ACRE PLOT



**ASSEMBLY AGENDA/MANAGER'S REPORT  
THE CITY AND BOROUGH OF JUNEAU, ALASKA**

Whale Sculpture / Seawalk Project Update

**ATTACHMENTS:**

|                          | <b>Description</b>                                    | <b>Upload Date</b> | <b>Type</b>  |
|--------------------------|-------------------------------------------------------|--------------------|--------------|
| <input type="checkbox"/> | Watt Memo re Whale Sculpture, March 2015              | 3/10/2015          | Cover Memo   |
| <input type="checkbox"/> | Whale Sculpture Presentation - 3/23/2015 Assembly COW | 3/10/2015          | Presentation |



City and Borough of Juneau  
Engineering & Public Works Department  
155 South Seward Street  
Juneau, Alaska 99801  
Telephone: 586-0800 Facsimile: 463-2606

DATE: 3/12/15

TO: Mary Becker, Chair  
Assembly Committee of the Whole

FROM: Rorie Watt, P.E., Director   
Engineering & Public Works Department

RE: Whale/Seawalk Project

We recently received the Army Corps of Engineers permit for the Whale Sculpture and Seawalk project (Gold Creek to JD bridge). This project has been long in conception, including the last year in the environmental permitting process. Planning for seawalk began in 2004 with adoption of the Long Range Waterfront Plan and planning for the sculpture began in 2007. The Assembly also passed resolutions in support of the sculpture project in 2007 and 2012.

This project is now ready to move into design/bidding/construction. The cost of the seawalk and whale infrastructure is estimated at about \$10M. We have initiated preparation of final design drawings and anticipate the project could be ready to bid early this summer of 2015.

The whale sculpture is expected to arrive late this summer, early in the fall of 2015. Construction of the joint project will take approximately one year. Project funding has been made available over successive CIPs and by July 1, there should be sufficient funds available to complete the projects. We will update our cost estimates as we move through the design process.

When the Assembly approved the 16B Dock project, it concurrently approved a funding stream for \$15M of seawalk projects. Some of those funds were used for the seawalk that was built in 2012-2013 from Miner's Cove Building to the South Franklin Dock. The remainder of that funding stream is available for most of this project (passenger fees are eligible for seawalk and creation of sufficient public space to accommodate seasonal passengers). In past CIPs the Assembly has provided \$675,000 of sales tax funding in the CIP for the sculpture pool and some park amenities.

There are two follow up projects that will need to occur – reconstruction of West Eighth Street (in the CIP for FY16 for design) and some type of restroom facility. Previously it had been anticipated that a new Alaska Marine Exchange building would go near the whale (and could house restrooms and other visitor amenities), but that is no longer the case.

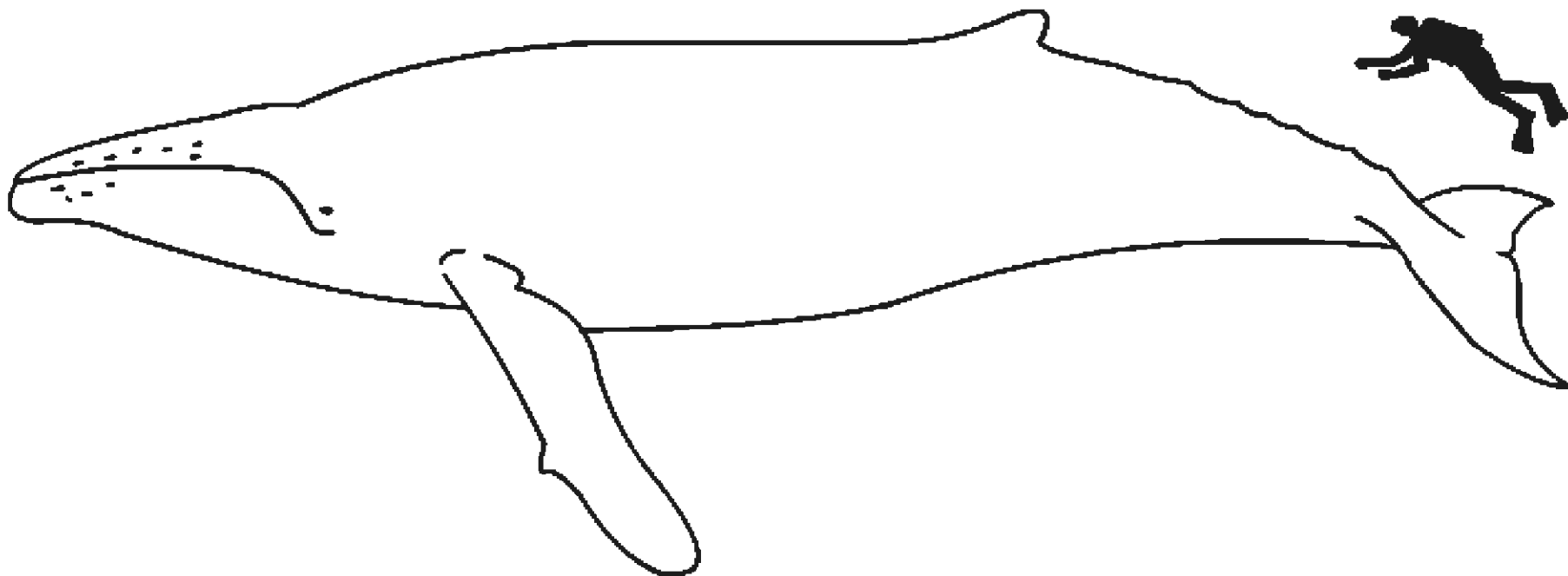
This is a big project with a long history, I have prepared a brief presentation of that history.

# Whale Project & Seawalk

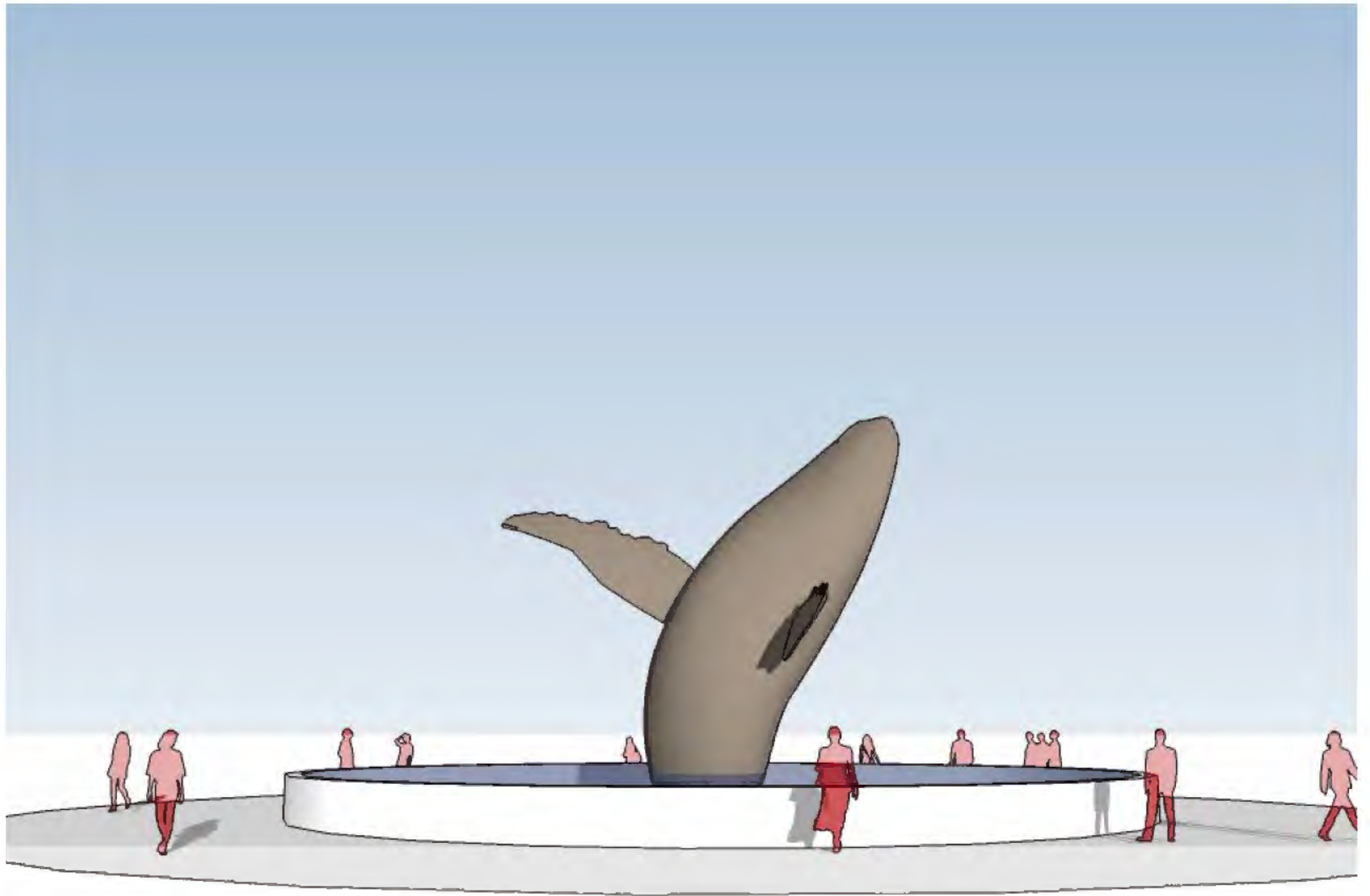


**Bill Overstreet**  
**Mayor of Juneau 1976-1982**

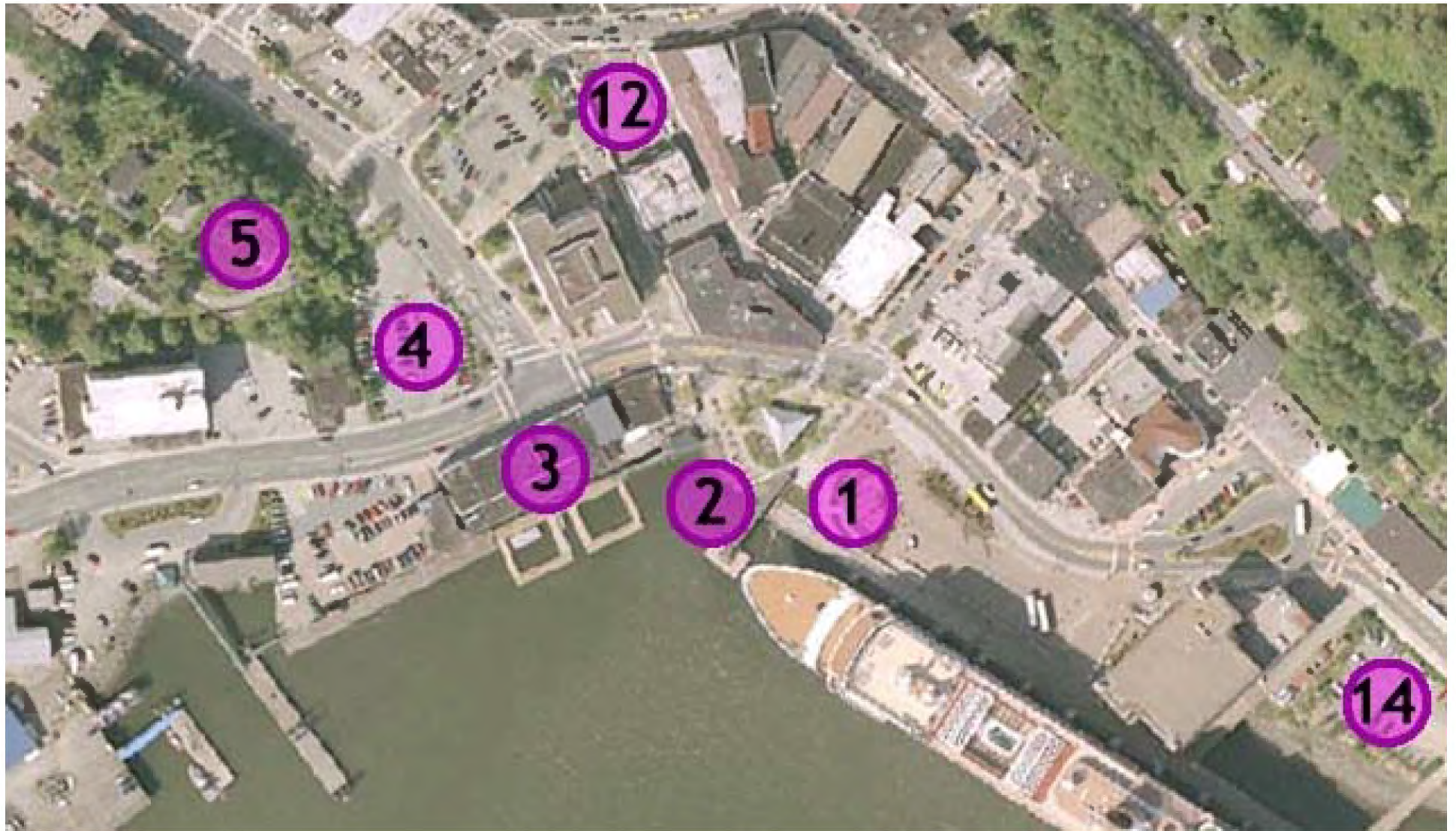




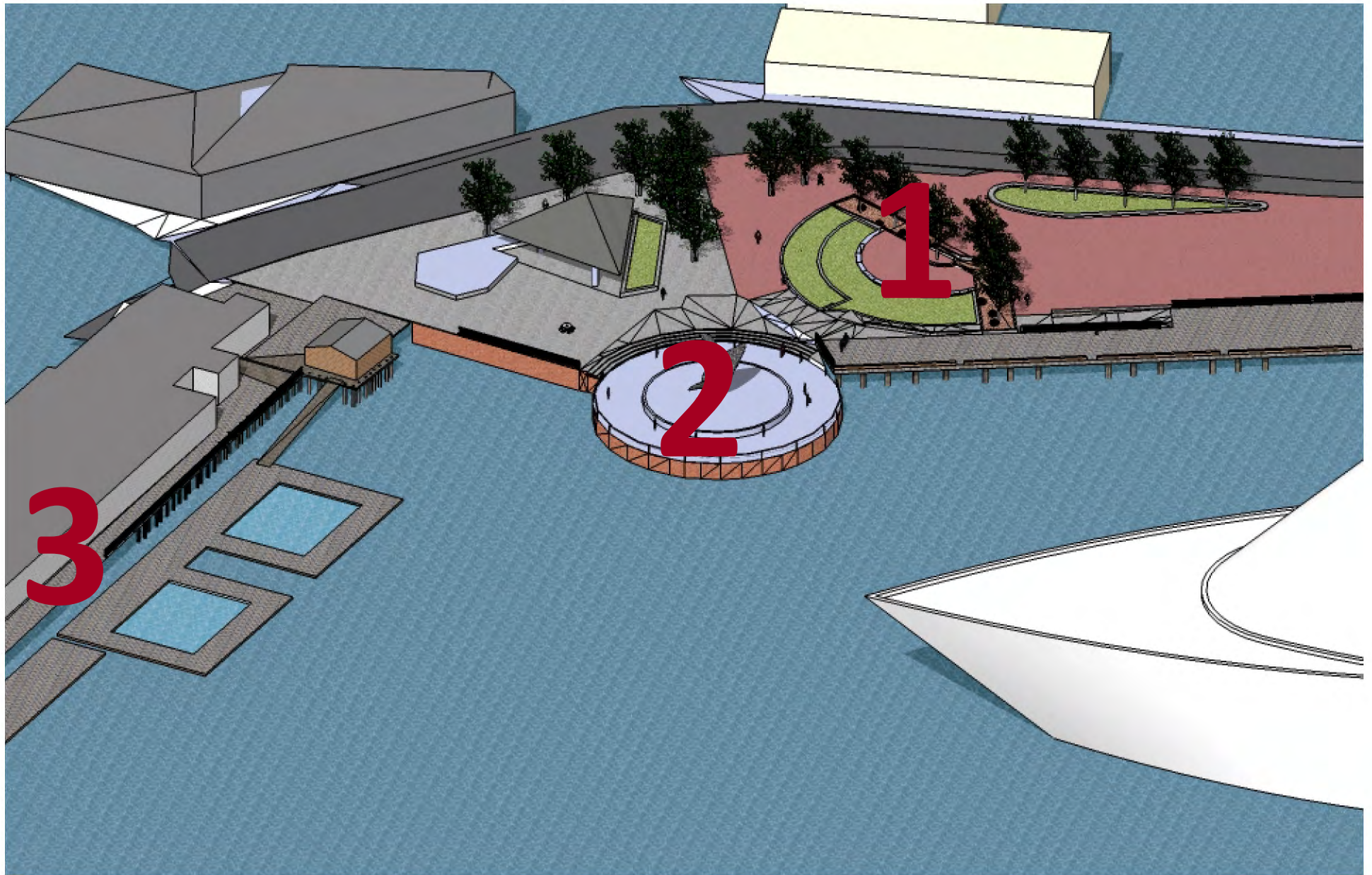












# CBJ Assembly Supports Whale Project

- On August 6, 2007 the City and Borough Assembly authorized the manager to:
- (1) accept and maintain the whale project on behalf of the City and Borough of Juneau;
- (2) approve the placement of the sculpture in Marine Park; and,
- (3) prepare the site to receive and properly position the sculpture, subject to an engineering evaluation and the normal city budgeting process.

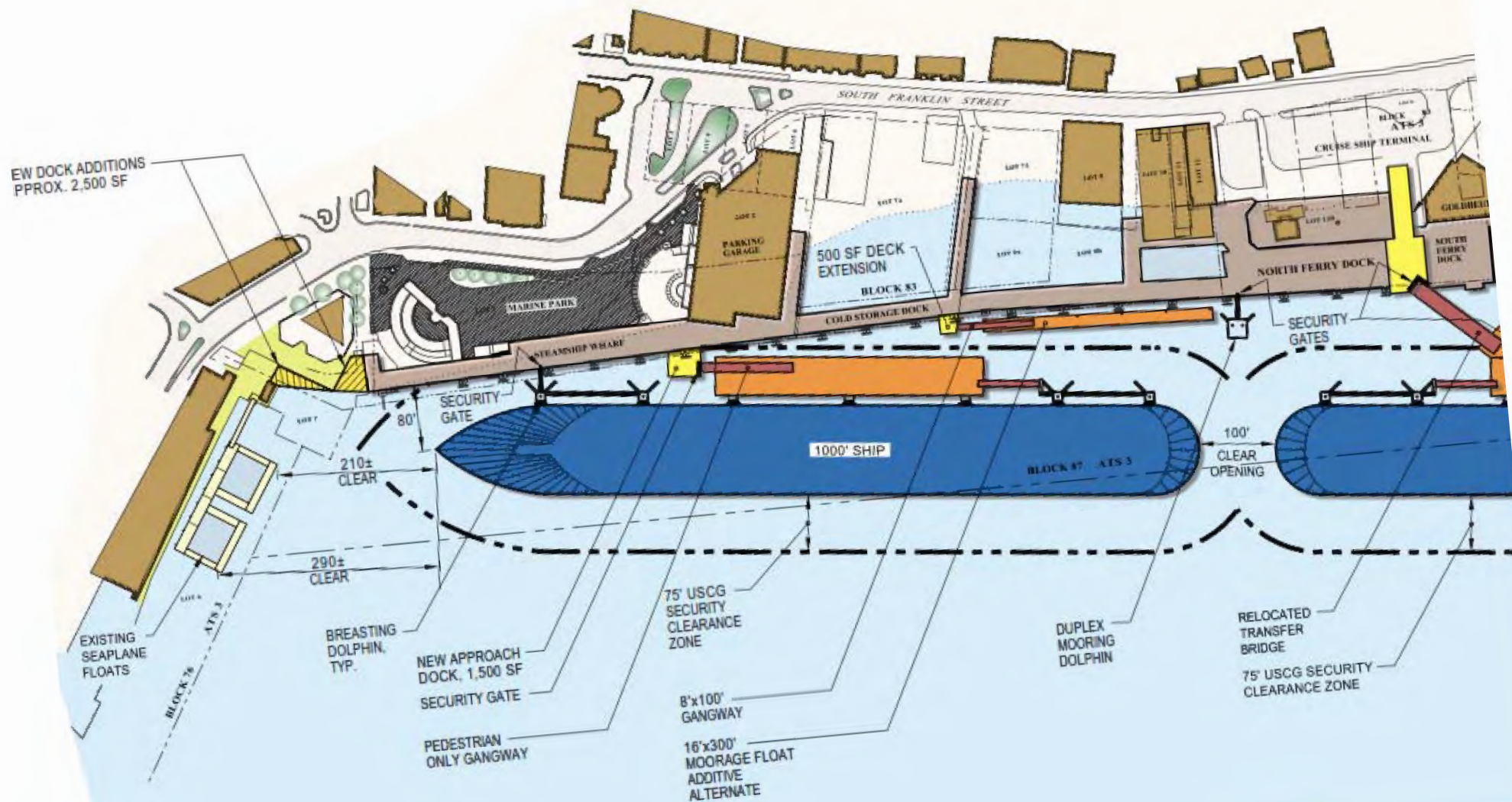




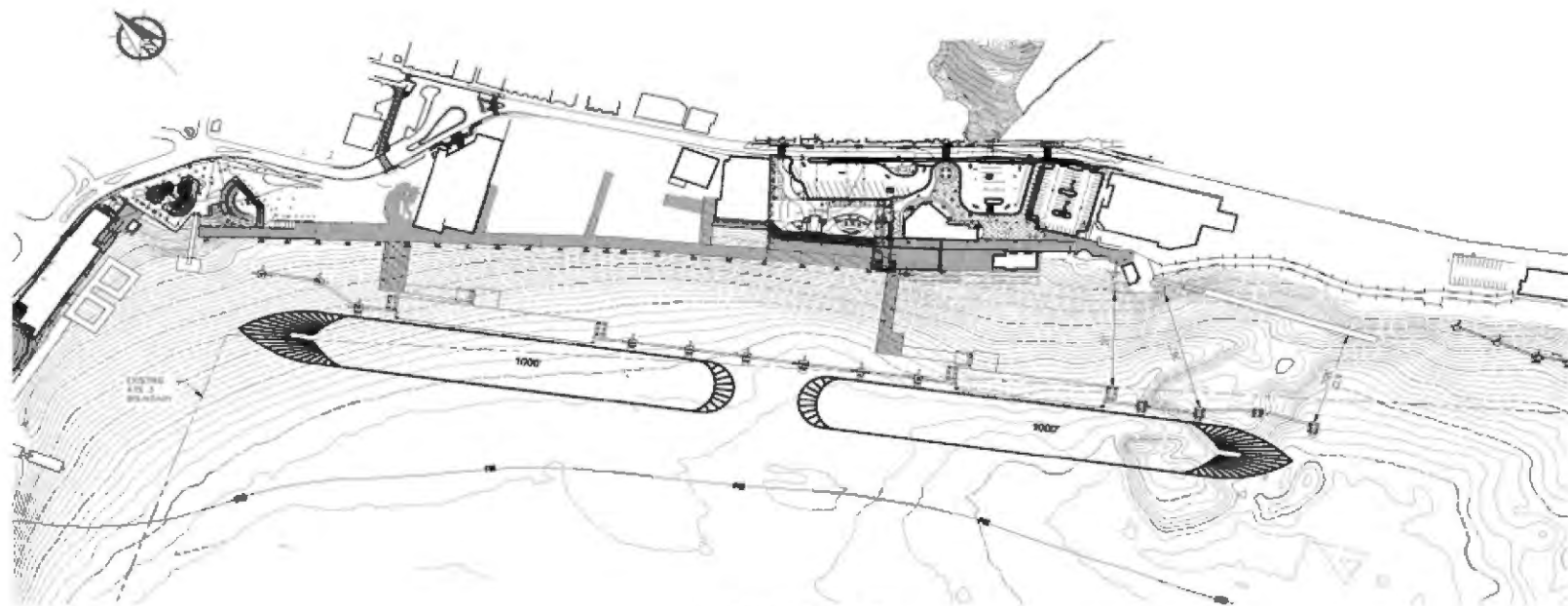
Clark Bronze, Emory Ave., Oregon, Nov 18, 2010 R.T. Wallen photo

# The Whale Takes Shape





# Concept 16(b) requires re-examination of Marine Park site



## RECONFIGURATION NOTES:

1. 300' REVISION AT SOUTH BERTH, 400' POSITION AT NORTH BERTH.
2. SOUTH BERTH ROTATED 50° OFFSHORE.
3. VERTIC. PILE DOLPHINS.
4. RECONFIGURED TANK FISHERIES DOCK WITH 80' DOCK FACE PARALLEL TO AIR TRANSFER FLIGHT.

## 1 OVERALL SITE PLAN RECONFIGURATION - OPTION B

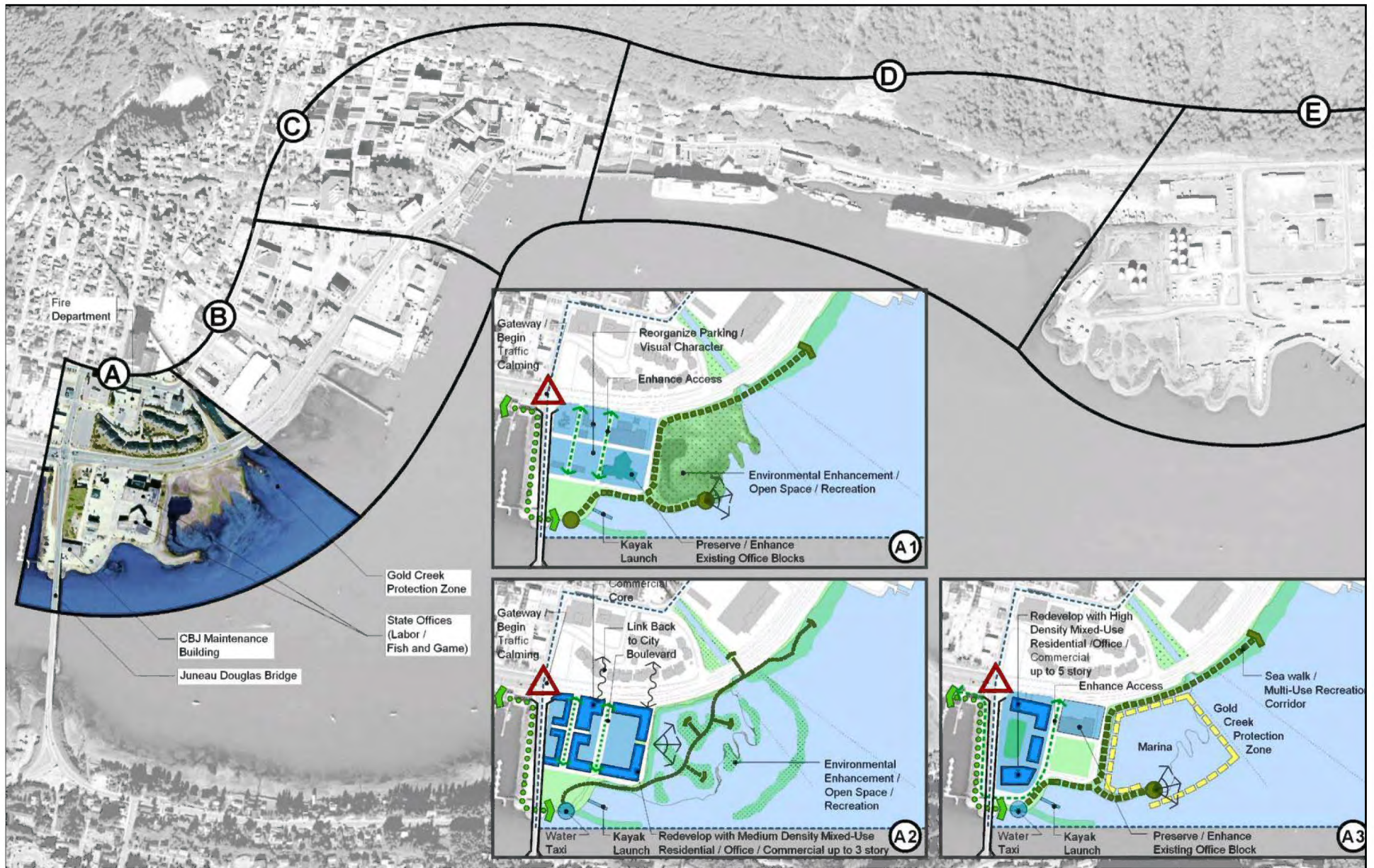
| <br><b>CITY/BOROUGH OF JUNEAU</b><br>ALASKA'S CAPITAL CITY<br><b>DOCKS &amp; HARBORS DEPARTMENT</b>                                                                                                                         | <b>REVISIONS</b><br><table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK.</th> <th>APP.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> |                                                          |             | REV. | DATE | DESCRIPTION | BY | CHK. | APP. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <b>P N D</b><br><b>ENGINEERS, INC.</b><br><small>1500 Glacier Highway, Box 140<br/>Juneau, Alaska 99801<br/>Phone: 907-586-8000<br/>Fax: 907-586-8800<br/>www.pndengineers.com</small> | <br><small>6-12-2010</small> | <b>PORT OF JUNEAU<br/>CRUISE SHIP BERTHS<br/>CONTRACT NO. 0012-001</b><br><b>OVERALL SITE PLAN<br/>RECONFIGURATION OPTION B</b><br><small>DESIGN TITLE: 0012-001-01<br/>PAGE PROJECT NO.: 0012-001-01<br/>SHEET NO.: 2 OF 4</small> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------|------|------|-------------|----|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                | REV.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DATE                                                     | DESCRIPTION | BY   | CHK. | APP.        |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"> <small>PRO. CHECKED. APP. SCALE</small><br/> <small>DATE APPROVED DATE</small> </td> <td style="text-align: center;"> <small>SCALE IN FEET</small><br/> <small>1" = 100'</small> </td> </tr> </table> | <small>PRO. CHECKED. APP. SCALE</small><br><small>DATE APPROVED DATE</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <small>SCALE IN FEET</small><br><small>1" = 100'</small> |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |
| <small>PRO. CHECKED. APP. SCALE</small><br><small>DATE APPROVED DATE</small>                                                                                                                                                                                                                                   | <small>SCALE IN FEET</small><br><small>1" = 100'</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          |             |      |      |             |    |      |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                     |

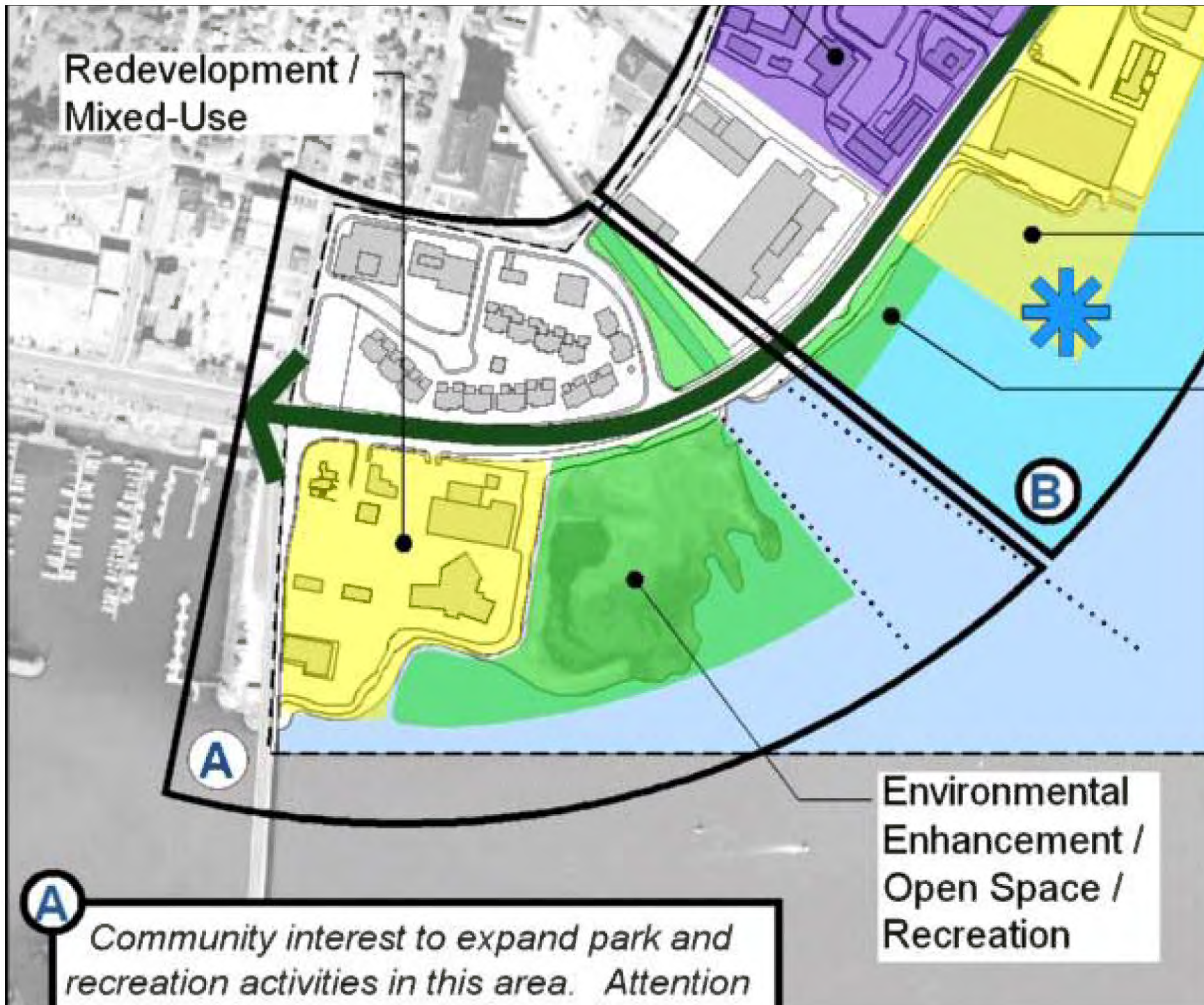








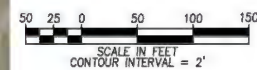






**PROPERTY OWNERSHIP**

-  CBJ
-  DOCKS AND HARBORS MANAGEMENT
-  PRIVATE
-  DOT
-  DOT AIRSPACE



The Assembly designates Bridge Park  
as its preferred site for the whale in  
2012













01/22/2015