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STAFF REPORT: REGULAR CALENDAR

Application Number: **5-14-1291**

Applicant: **South Coast Water District**

Project Location: Coastal Bluffs within Three Arch Bay Community (generally between termini of South La Senda Drive and North La Senda Drive), City of Laguna Beach, Orange County

Project Description: Stabilize and enlarge a 4,176-foot long segment of existing underground tunnel and sewer pipeline within the coastal bluffs. Includes installation of a new 24-inch diameter sewer pipeline within the existing tunnel. The existing sewer pipeline will be protected in place. A 740-foot long segment of the existing tunnel and pipeline will be abandoned and replaced by a new segment of tunnel/pipeline located further inland under South La Senda Drive. Five adits (tunnel entrances) are proposed to be repaired and two adits will be abandoned.

Staff Recommendation: Approval with Conditions

SUMMARY OF STAFF RECOMMENDATION

The development proposed by this application is the portion of the Tunnel Stabilization and Sewer Pipeline Replacement Project (the Project) within the uncertified Three Arch Bay area of the City of Laguna Beach. The proposal is part of a larger project which includes the replacement of approximately 10,424 linear feet of sewer pipeline installed between Three Arch Bay and Aliso Beach by the South Coast Water District in 1954. The majority of the existing sewer pipeline is located in a series of approximately 6-foot diameter tunnels excavated into the San Onofre Breccia,

approximately 40 to 80 feet below the tops of the coastal bluffs, at depths varying from 10 to 30 feet above mean sea level. The sewer pipeline flows by gravity, serves approximately 14,000 residences and businesses, and conveys approximately one million gallons of sewage per day to a treatment facility near Aliso Beach.

The existing tunnel is proposed to be enlarged to a diameter of approximately 9 feet and its walls stabilized with 4 to 6 inches of shotcrete. The existing 24-inch sewer pipeline is proposed to be protected in place, a concrete floor poured on top, and a new 24-inch PVC sewer pipeline installed on top of the new floor. The existing pipeline is proposed to remain in place and continue to transport waste throughout the approximately five-year life of the Project. At the conclusion of the Project, the existing pipeline will be protected in place and may be subject to temporary use in cases of maintenance or emergency.

A major issue is whether the proposed project (a repair of the sewer system in its current location – for the most part) is the best alternative, or if there exists a feasible alternative which would result in relocating the sewer line further inland in order to minimize risks to life and property. The EIR addressed this question directly. The EIR identified and analyzed six alternatives to the proposed Project. Several of the identified alternatives would not adequately address the current state of disrepair of the existing tunnel. If the existing tunnel collapsed in the future, repairs would be time consuming, dangerous, costly, and damaging to the geology of the bluff. Other alternatives, including realigning the tunnel and sewer pipeline under South Coast Highway, would have more negative effects on the geology of the area than the proposed Project. Based on the analysis, none of the identified alternatives would substantially lessen significant adverse effect which the proposed Project may have on the environment.

However, a segment of the project will be moved further inland in order to minimize risks from natural hazards. This segment of the tunnel and sewer pipeline, approximately 740 feet long, is proposed to be realigned beneath South La Senda Drive. Multiple geologic consultants have reviewed the proposed Project, as have the Commission's staff geologist and coastal engineer. Those reviews and multiple coastal hazards analyses have concluded that the development will be secure for a minimum of 100 years and will not require a shoreline protective device. Therefore, the proposed project, as conditioned, has been determined to be the alternative with the least adverse effects on the environment.

The Commission certified the City of Laguna Beach Local Coastal Program (LCP) on January 13, 1993 and approved a major amendment to the LCP in 2012. However, the Three Arch Bay portion of the City of Laguna Beach has never had a certified LCP and is therefore subject to Commission permit jurisdiction, with Chapter 3 of the Coastal Act as the standard of review.

Because there are no construction staging areas proposed within the Commission's permit jurisdiction, the development proposed by Coastal Development Permit Application No. 5-14-1291 will have no negative impacts on public access or recreation. The City of Laguna Beach conditionally approved Local Coastal Development Permit No. 13-1142 for the portion of the larger project within its jurisdiction on December 11, 2013. That includes tunnel stabilization and sewer pipeline replacement in the area north of Three Arch Bay, up to Aliso Beach. All four construction staging areas proposed during the approximately five-year construction period of the larger project

are within the City's permit jurisdiction area, adjacent to existing access portals at Aliso Beach and Camel Point Beach and adjacent to Adit 16A/B at Thousand Steps Beach. The City also approved a 20-foot diameter shaft to be drilled from a vacant lot on the inland side of South Coast Highway near 4th Avenue, connecting to the existing tunnel and providing the primary construction accessway.

Following comments from Commission staff, the City amended its approval to restrict the use of the beach staging areas to the minimum size possible consistent with the ability to complete the development. The City has withdrawn its Notice of Final Action and agreed to wait for the Commission's action on Coastal Development Permit Application No. 5-14-1291 before issuing Local Coastal Development Permit No. 13-1142. That permit will be appealable to the Commission for 10 working days after the City issues its Notice of Final Action.

Commission staff recommends **approval** of Coastal Development Permit Application No. 5-14-1291 with special conditions requiring the applicant to: 1) demonstrate that it has the authority to comply with all conditions of approval, 2) agree to conditions for repair and removal of the development, 3) agree that no shoreline protective device(s) shall ever be constructed to protect the development, 4) implement best management practices to minimize adverse impacts to water quality during construction and operation of the development, 5) comply with the requirements of the resource agencies, and 6) assume the risks of the development.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit Application No. 5-14-1291 subject to the conditions set forth in the staff recommendation.*

Staff recommends a **YES** vote of the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves Coastal Development Permit No. 5-14-1291 for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that will substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration**. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation**. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment**. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land**. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

This permit is granted subject to the following standard conditions:

1. **Legally Required Development Rights and Easements.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall demonstrate that it has the authority to comply with all conditions of approval, including but not necessarily limited to, a demonstration that it has secured a legal right, interest, or other entitlement to use the subject properties for the proposed development.

2. **Repair and Removal of the Development.** By acceptance of this Permit, the applicant agrees, on behalf of itself and all other successors and assigns, that should any underground development approved under this Permit, including but not limited to, any individual section of any adit, portion of the tunnel, or section of pipeline larger than 100 square feet become exposed due to structural failure, erosion, or other manmade or natural processes, the applicant shall conduct a study of the structural stability of the approved development and an analysis of alternatives for correcting any structural deficiencies. This study shall be submitted to the Executive Director in order to determine if the proposed correction requires a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations.

   If, at any time, a government agency orders the development to be decommissioned, the applicant or its successors and assigns shall conduct an analysis to determine the least environmentally damaging alternative for decommissioning the development. At the end of the useful life of the development, the applicant or its successors and assigns shall conduct an analysis to determine the least environmentally damaging alternative for decommissioning the development. Removal of the development shall be one of the alternatives considered in any analysis required by this condition. No removal/decommissioning of the approved development shall take place until the applicant submits the required analyses, as stated above, to the Executive Director in order to determine if the removal/decommission of the development requires a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations.

3. **No Future Shoreline Protective Device(s).** By acceptance of this Permit, the applicant agrees, on behalf of itself and all other successors and assigns, that no shoreline protective device(s) or bluff protection device(s) shall ever be constructed to protect the development approved pursuant to coastal development permit No. 5-14-1291 including, but not limited to, the tunnel, the sewer pipeline, the adits, and any future improvements, in the event that the development is threatened with damage or destruction from sea level rise, flooding, erosion, storm conditions or other natural hazards in the future. By acceptance of this

permit, the applicant hereby waives, on behalf of itself and all successors and assigns, any rights to construct such devices that may exist under Public Resources Code Section 30235.

4. **Water Quality.** In order to minimize adverse environmental impacts and the unpermitted deposition, spill or discharge of any liquid or solid into the sea, the applicant shall implement the following construction-related and operational best management practices:

   a. Machinery or construction materials are prohibited at all times in the subtidal and intertidal zones.

   b. Staging and storage of construction machinery and storage of debris shall not take place on any sandy beach.

   c. Sand from the beach, cobbles, or shoreline rocks shall not be used for construction material.

   d. Netting, sandbags, tarps and/or other forms of barriers shall be installed between the shoreline and work areas and equipment storage areas to prevent any unpermitted material from entering the sea.

   e. The storage or stockpiling of soil, silt, other organic or earthen materials, or any materials and chemicals related to the construction shall not occur where such materials/chemicals could pass into the waters of the sea. Stockpiled fill shall be stabilized with geofabric covers or other appropriate cover.

   f. Spills of construction equipment fluids or other hazardous materials shall be immediately contained on-site and disposed of in an environmentally safe manner as soon as possible.

   g. Construction vehicles operating at the project site shall be inspected daily to ensure there are no leaking fluids. If there are leaking fluids, the construction vehicles shall be serviced immediately. Equipment and machinery shall be serviced, maintained and washed only in confined areas specifically designed to control runoff and prevent discharges into the sea. Thinners, oils or solvents shall not be discharged into sanitary or storm sewer systems.

   h. All floatable debris and trash generated by construction activities within the project area shall be disposed of as soon as possible or at the end of each day.

   i. All grading and excavation areas shall be properly covered and sandbags and/or ditches shall be used to prevent runoff from leaving the site, and measures to control erosion must be implemented at the end of each day's work.

   j. In the event that lead-contaminated soils or other toxins or contaminated material are discovered on the site, such matter shall be stockpiled and transported off-site only in accordance with Department of Toxic Substances Control (DTSC) rules and/or Regional Water Quality Control Board (RWQCB) regulations.

k. At the end of the construction period, the applicant shall inspect the project area and ensure that all debris, trimmings, trash, and construction materials have been removed from the area and taken to an appropriate location.

The applicant shall include the requirements of this condition on all plans and contracts issued for the project. The applicant shall implement and carry out the project staging and construction plan during all staging and construction activities.

5. **Conformance with the Requirements of the Resource Agencies.** The applicant shall comply with all permit requirements and mitigation measures of the California Department of Fish and Wildlife, the Regional Water Quality Control Board, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service with respect to preservation and protection of water quality and the marine environment. Any changes to the approved project which are required by the above-stated agencies shall be submitted to the Executive Director in order to determine if the proposed change shall require a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations.

6. **Assumption of Risk, Waiver of Liability and Indemnity Agreement.** By acceptance of this permit, the applicant, on behalf of a) itself; b) its successors and assigns, and c) any other holder of the possessory interest in the development authorized by this permit, acknowledges and agrees: i) that the site may be subject to hazards from waves, flooding, earthquakes, and other unforeseen events; ii) to assume the risks to the applicant and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards; and v) to agree to include a provision in any subsequent sublease or assignment of the development authorized by this permit requiring the sublessee or assignee to submit a written agreement to the Commission, for the review and approval of the Executive Director, incorporating all of the foregoing restrictions identified in i through v.

7. **Liability for Costs and Attorneys Fees.** By acceptance of this permit, the Applicant/Permittee agrees to reimburse the Coastal Commission in full for all Coastal Commission costs and attorneys fees -- including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorneys fees that the Coastal Commission may be required by a court to pay -- that the Coastal Commission incurs in connection with the defense of any action brought by a party other than the Applicant/Permittee against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit. The Coastal Commission retains complete authority to conduct and direct the defense of any such action against the Coastal Commission.

IV. FINDINGS AND DECLARATIONS

A. PROJECT LOCATION AND DESCRIPTION

The proposed development is the portion of the Tunnel Stabilization and Sewer Pipeline Replacement Project (the Project) within the Three Arch Bay community of the City of Laguna Beach **(Exhibit 1)**. The majority of the existing sewer pipeline is located in a series of approximately 6-foot diameter tunnels excavated into the San Onofre Breccia base of the coastal bluffs, at depths varying from approximately 10 to 70 feet above mean sea level. The tunnel is aligned 40 to 80 feet below the top of the approximately 100 foot high coastal bluffs. The project site crosses beneath approximately 38 residential properties within the Three Arch Bay area. The applicant (South Coast Water District) has obtained easements from all but one of 38 residential property owners, allowing the proposed project to be completed beneath their properties. **Special Condition 1** requires that, prior to issuance of the permit, the applicant demonstrate that it has the authority to comply with all conditions of approval by, at a minimum, demonstrating that it has a legal right, interest, or other entitlement to use the subject property from all of the owners.

The South Coast Water District proposes to enlarge and strengthen the entire existing approximately 10,424-foot long Beach Interceptor Sewer and Tunnel in order to eliminate the risk of rock falls and timber support failure, and damage to the existing 24-inch sewer pipeline. The proposed project is intended to reduce the risk of release of sewage onto the beach and ocean below. Less than half of the length of the proposed tunnel and pipeline repair project are subject to this permit application, as approximately 6,248 feet of the tunnel are within the City of Laguna Beach's permit jurisdiction. Local Coastal Development Permit No. 13-1393 covers the portion of the proposed project within the City's certified LCP area.

The following measures are proposed for the majority of the portion of the tunnel and sewer pipeline within the Commission's permit jurisdiction **(Exhibit 2)**:

- Protect the existing sewer pipeline in place and enlarge and stabilize the existing tunnel.
- Encase the existing pipeline in concrete. Following concrete encasement of the pipe, the tunnel will be enlarged to a horseshoe 9-foot diameter cross-section and lined with shotcrete. A concrete invert slab (tunnel floor) will be poured above the existing pipeline following the shotcrete installation. The invert slab will provide a finished surface in the tunnel for worker access and transport of equipment and materials. A new 24-inch sewer pipeline, installed in 20 foot sections, will be installed on the new floor of the enlarged tunnel **(Exhibit 3)**.
- The existing pipeline will remain in operation during the tunnel rehabilitation activities.
- The planned 9-foot diameter tunnel enlargement is the minimum size necessary to efficiently complete the rehabilitation. The enlarged tunnel will allow for a new 24-inch diameter sewer pipeline, room to permit workers to safely access the tunnel and to walk upright (currently not possible), and passage of a small vehicle for maintenance.

However, a portion of the existing tunnel and pipeline will be abandoned and replaced with a new 740-foot long segment situated in a more inland location in order to avoid the possibility of extreme natural events exposing the tunnel in the vicinity of Adit 25 (further analyzed in the Natural Hazards section of this report). The location of the proposed new 740-foot long section of new tunnel is

beneath South La Senda Drive **(Exhibit 2)**. The proposed realignment would divert from the existing alignment at Station 115+81, pass underneath the residence at 90 South La Senda Drive, and then continue under the street of South La Senda Drive to the drop manhole at the beginning of the existing tunnel (Station 120+89). The realigned tunnel would have the same approximately 9-foot diameter shape as the rest of the enlarged and stabilized main tunnel and would house the new 24-inch sewer pipeline, as well as a connection to the existing pipeline. The segment of abandoned tunnel is proposed to be backfilled with cellular grout. The existing drop manhole at the eastern end of the tunnel is located in a concrete vault, which is proposed to be redesigned to accommodate the new realigned tunnel.

For tunnel reconstruction subject to this permit application (i.e., within the area of Commission permit jurisdiction), all proposed tunnel construction activities are underground and tunnel access is proposed from the existing tunnel (via an adit) at the northwest boundary of the Three Arch Bay community. The seven adits within Three Arch Bay will either be abandoned or repaired as illustrated in **Exhibit 4**. At Adit 23 a metal barrier is proposed to deter beach visitors from climbing on the bluff face. Also, a segment of sewer pipe which is currently exposed on the bluff face between an upland residence and Adit 23 is proposed to be removed and connected to the new sewer pipeline within the bluff.

Most of the existing underground sewer connections serving individual residences would be reconnected to the new sewer pipeline within a few feet of the existing connections, while approximately twelve connection lines are proposed to be reconfigured underground to connect to the proposed tunnel and sewer pipeline under South La Senda Drive. All of the reconfigurations of residential connections will be conducted from the existing and proposed tunnels – no above ground or under-foundation work will be required.

For more detailed information, see **Exhibit 2** for the full proposed alignment of the tunnel and sewer pipeline in the Three Arch Bay area[1]. Construction of the tunnel within the Three Arch Bay area is projected to begin in Summer 2016 and last for approximately five years. Waste materials are anticipated to be primarily rocks and rotted timber and will be conveyed through the tunnel to trucks at construction staging areas outside of the Commission's permit jurisdiction.

B. PROJECT HISTORY

The South Coast Water District owns and operates the Beach Interceptor Sewer and Tunnel located between Aliso Beach and Three Arch Bay. The proposed Project has been presented to the public at numerous meetings and the South Coast Water District has offered guided tours of areas near the proposed tunnel.

The full tunnel is approximately 10,424 feet long and was originally constructed in 1954. The original 21-inch diameter vitrified clay sewer pipeline was replaced with a 24-inch reinforced plastic mortar pipe in 1974, and the original pipe was crushed and left in the tunnel as bedding for the new

[1] Full plans and the permit file are available in the Commission's Long Beach Office and additional documents and exhibits are on the South Coast Water District website: http://www.scwd.org/projects/tunnelmain1/default.asp

pipe. That 40-year old pipe currently conveys approximately one million gallons of sewage per day from approximately 14,000 residences and businesses to a treatment facility near Aliso Beach.

The tunnel has become severely deteriorated, resulting in risk of damage to the sewer pipeline and presenting safety issues for maintenance workers. Numerous timber side posts have deteriorated and can no longer support the tunnel as originally designed. Additionally, much of the wooden lagging is likewise deteriorated (rotting) and local failures of the wooden supports and lagging have resulted in rock falls into the tunnel. The tunnel has been repaired over 200 times since 2005, with portions lined with shotcrete.

The most significant repair occurred in 2007 when the South Coast Water District conducted an emergency repair to an approximately 750 foot section of the tunnel inside the bluff adjacent to Thousand Steps Beach between Adit 14 and Adit 16A under an emergency permit issued by the City of Laguna Beach. The construction method for that portion of the tunnel was similar to that proposed by the subject permit application and the tunnel was stabilized and expanded successfully with a new section of sewer pipeline installed atop a concrete floor and the old sewer line preserved in place.

However, more extensive repairs to the existing tunnel and pipeline infrastructure are necessary to ensure the continued operation of the system. The South Coast Water District has been planning the proposed Project since the 2007 repairs. The Final Environmental Impact Report (FEIR) for the larger project (including the areas within the City of Laguna Beach permit jurisdiction) was certified by the South Coast Water District (the lead agency under the California Environmental Quality Act) on November 11, 2010. An addendum to the FEIR – to include the proposed realigned portion of the tunnel – was certified March 28, 2013.

On December 11, 2013, the City of Laguna Beach Planning Commission approved Conditional Use Permit 13-1393, Design Review 13-1394, and Local Coastal Development Permit 13-1142 for the portion of the project within the City's permit jurisdiction. That approval includes tunnel stabilization and sewer pipeline replacement in the area north of Three Arch Bay, up to Aliso Beach. All four of the proposed construction staging areas to be utilized during the approximately five-year construction period of the larger project are within the City's permit jurisdiction area, adjacent to existing access portals at Aliso Beach and Camel Point Beach, and adjacent to Adit 16A/B at Thousand Steps Beach. The City also approved a 20-foot diameter shaft to be drilled from a vacant lot on the inland side of South Coast Highway near 4th Avenue, connecting to the existing tunnel and providing the primary construction accessway.

Following comments from Commission staff, the City amended its approval on July 23, 2014 to restrict the use of the beach staging areas to the least size possible consistent with the ability to complete the development. The City also required the applicant to waive the right to a shoreline protective device over the life of the development. The City has withdrawn its Notice of Final Action and agreed to wait for the Commission's action on Coastal Development Permit Application No. 5-14-1291 before re-issuing the Notice of Final Action for Local Coastal Development Permit No. 13-1142.

C. OTHER AGENCY APPROVALS

The California Water Resources Control Board approved a water discharge permit on April 7, 2014. The United States Department of Fish and Wildlife issued a concurrence letter on April 25, 2013. The applicant has also obtained permits from Orange County, the City of Dana Point, and the California Department of Transportation for work related to the larger project which is not proposed within the Three Arch Bay segment of the Project under the Commission's permit jurisdiction. Should any additional approvals be required, **Special Condition 5** requires the applicant to comply with the requirements of the resource agencies.

D. NATURAL HAZARDS

Section 30253 of the Coastal Act states:

> *New development shall:*
>
> *(a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*
>
> *(c) Be consistent with the requirements imposed by an air pollution control district or the State Air Resources Board as to each particular development.*
>
> *(d) Minimize energy consumption and vehicle miles traveled*
>
> *(e) Where appropriate, protect special communities and neighborhoods that, because of their unique characteristics, are popular visitor destination points for recreational uses.*

The Coastal Act states that new development must minimize risks to life and property and not create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area. The South Coast Water District and its consultants have studied the geology of the bluffs at Three Arch Bay since 1998. A summary of their studies and analyses includes:

- Engineering reviews by AKM/Haley Aldridge in 1998.
- Engineering reviews by Hatch Mott MacDonald in 2006 and 2007, which identified sections of the existing tunnel where special construction measures may be required, including areas at the south end of the existing tunnel (the area proposed to be realigned) where overlaying terrace materials may have caused landslides affecting residential properties in the past.
- Geotechnical studies by Lawson and Associates Geotechnical Consulting in 2010, which identified design parameters necessary for safe tunnel design.

- Constructability reviews by two tunnel contractor teams in 2011 and 2012, each of which identified construction issues and realignment solutions for the south end of the existing tunnel.
- Geotechnical reports by Lawson and Associates Geotechnical Consulting in 2012 for two boreholes conducted for the proposed realigned segment.
- Engineering review and design of potential tunnel realignment by Hatch Mott MacDonald in 2012, which determined the optimal location for the realignment of the tunnel.
- Geotechnical review of the tunnel alignment at Adit 25 by Lawson and Associates Geotechnical Consulting in 2012.
- Technical memorandum on realignment alternative options by Hatch Mott MacDonald in 2012.
- Bluff and shoreline erosion analysis by Geosoils Inc. in 2013.
- Environmental review for the proposed realignment as an addendum to the certified Final Environmental Impact Report in 2013.

The preceding summary relates to engineering and geotechnical studies and analyses conducted specifically for portions of the proposed tunnel and sewer pipeline within the Three Arch Bay section of the larger project. Additional studies were completed for segments of the tunnel outside of the Commission's jurisdiction.

A major issue is whether the proposed project (a repair of the sewer system in its current location – for the most part) is the best alternative, or if there exists a feasible alternative which would result in relocating the sewer line further inland in order to minimize risks to life and property. The EIR addressed this question directly.

The Final EIR identified and analyzed six alternatives to the proposed tunnel alignment, as required by section 15126 of the California Environmental Quality Act. Alternative 1: No Project was determined to be unacceptable because it would not satisfy the primary objective of the project to eliminate the risk of a spill of the aging sewer pipeline. Alternative 2: Encase Pipe and Fill Tunnel was determined to be inferior because it would not allow for future necessary inspections and repairs of the tunnel. Alternative 3: Abandon Tunnel and Replace with Lift Stations and a Sewer in South Coast Highway was determined to be inferior because of severe impacts to traffic, land use, noise, and geology during construction. Alternative 4: Monarch Beach Sewer Lift Station with Smaller Pipe was determined to be inferior because of severe impacts to traffic, noise, and geology. Alternative 5: Slip-Lining Without Tunnel Repair was determined to be inferior because it would not eliminate the risk of tunnel failure and pipeline fracture. Alternative 6: Construct New Tunnel Parallel to Existing Tunnel was determined to be inferior because it would increase construction times and costs and would not reduce the risk of failure to the existing tunnel.

In summary, Alternatives 2, 5, and 6 would not adequately address the current state of disrepair of the existing tunnel. If the existing tunnel collapsed in the future, repairs would be time consuming, dangerous, costly, and damaging to the geology of the bluff. Additionally, Alternatives 2 and 5 would not allow for future repairs of the sewer pipeline.

Alternatives 4 and 5 would realign the tunnel (or a portion of the tunnel) upland to South Coast Highway. These alternatives would require the installation of one or multiple lift stations to power sewage uphill at points along multiple sewer pipelines. Individual homeowners would be required to relocate sewer laterals or install their own lift pumps. Construction activities under South Coast Highway would be time consuming, dangerous, costly, and would severely impact traffic and noise in the area. Future repairs and maintenance would require additional street repairs. Other streets would be affected by the necessary installation of sewer laterals and lift stations. The existing tunnel or a portion of the existing tunnel would still need to be abandoned and existing sewer pipes inside the bluffs abandoned or relocated. These alternatives would have more negative effects on the geology of the area than the proposed Project. Additionally, Alternative 5 would violate South Coast Water District policies because it would carry unacceptable spill risks.

As the lead agency for CEQA, the South Coast Water District published the alternatives analysis in a Recirculated Draft EIR in August 2010. After allowing time for public review and comment, the District certified the Final EIR in November 2010. However, after conducting additional studies and analyses as summarized above, the District and its consultants determined that future erosion or landslides due to storm events or earthquakes could expose the southern section of the tunnel, and that if the tunnel were to be exposed, a failure to the sewer pipeline could occur. In order to mitigate that risk, the District conducted additional engineering, geotechnical, and natural hazards analyses.

The South Coast Water District and its consultants analyzed two new alternatives, not previously analyzed in the Draft EIR or the Final EIR, specifically regarding the southern section of pipeline in the area of potential geologic instability. Alternative A would realign approximately 740 feet of the tunnel under South La Senda Drive and the residence at 90 South La Senda (estimated as 720 feet in **Exhibit 5** which describes and diagrams the alternatives in detail). Alternative B would realign approximately 1,310 feet under South La Senda Drive and Barranca Way. Alternative B would necessitate construction of a new tunnel and sewer pipeline almost twice as long as Alternative A, and would require the repair of the same approximately 702 foot section of existing tunnel and sewer pipeline between Station 116 and Station 109+22. That section would need to be repaired in order to serve 12 residences which currently have sewer laterals flowing by gravity to the existing pipeline. A further alternative considered by the District was to attempt to realign each of those 12 sewer laterals to the pipeline proposed in Alternative B, but this would require each residence to install a pump to propel sewage uphill to the new pipeline and would require significant landform alteration at the surface and subsurface level. Ultimately, Alternative B would result in two tunnel sections, each with poor access, and one with service to just 12 residences.

After study, analysis, and peer review of the alternatives, as well as outreach with the residents of South La Senda Drive and the public at large, the South Coast Water District selected Alternative A and completed an Addendum to the Final Environmental Impact Report in February 2013. The Addendum analyzed the differences between the originally endorsed project in the Final EIR and the change proposed by Alternative A. The Addendum contained a full environmental checklist and analysis of all potential environmental impacts and determined that the proposed realignment would not have any new or substantially more severe impacts than the project evaluated in the Final EIR. There were no challenges to the Addendum to the Final EIR and it was certified by the South Coast Water District on March 28, 2013.

The engineering, geotechnical, and natural hazards studies and analyses conducted by the South Coast Water District and its contractors have determined that not only is the proposed realigned section under South La Senda Drive the least damaging environmental alternative, the proposed repair and enlargement of all other sections of the existing tunnel is the least damaging alternative as well. The proposed realignment of the 740 feet of tunnel and sewer pipeline under South La Senda Drive will eliminate the risk of slope failure of the section of bluff where the tunnel and pipeline are currently aligned.

The geotechnical analyses show that the proposed tunnel and sewer pipeline will be secure for at least the 100 year projected life of the Project. A natural hazards analysis by Geosoils Inc. considered the most severe projected sea level rise scenario of 5.5 feet by 2100 in conjunction with a total loss of beach area and bluff material, resulting in continuous wave action on the bedrock material of the sea cliff. Even in this scenario, the projected retreat of the sea cliff is 5.2 feet, which would have no impact on the proposed tunnel or sewer pipeline alignment. The analysis found that a severe cliff retreat could have an impact in the next 100 years on the five adits which are proposed to be repaired and used as the primary maintenance access points to the tunnel; however, that impact could be mitigated by relocating the adit doors further into the cliff face should they become exposed.

Section 30253 of the Coastal Act requires that new development shall not require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. Therefore, **Special Condition 2** requires the applicant to agree to conditions for repair and removal of the development, which would be triggered by exposure of any portion of the approved development larger than 100 square feet. Should the development be decommissioned, the applicant would be responsible for conducting an alternatives analysis to determine the least environmentally damaging alternative for decommissioning the development.

Multiple geotechnical analyses analyzed the potential effects of the proposed Project on the existing geologic conditions and determined that it will not create or contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way, as required by Section 30253. The analyses did not indicate that any shoreline or bluff protective devices would be required to protect the proposed development. **Special Condition 3** requires the applicant to agree that no shoreline protective device(s) or bluff protection device(s) shall ever be constructed to protect the development.

Commission Staff Geologist Mark Johnsson and Coastal Engineer Lesley Ewing have also reviewed the project and agree with the applicant's analyses. However, no development in the ocean or near the shoreline can be guaranteed to be safe from hazard. All development located in or near the ocean has the potential for damage caused by wave energy, floods, seismic events, storms, and erosion. The proposed project is located adjacent to the beach about 100 feet inland of the Pacific Ocean and is susceptible to natural hazards. The Commission routinely imposes conditions for assumption of risk in areas at high risk from hazards. **Special Condition 6** ensures that the applicant understands and assumes the potential hazards associated with the development.

Coastal Act section 30620(c)(1) authorizes the Commission to require applicants to reimburse the Commission for expenses incurred in processing CDP applications. See also 14 C.C.R. §

13055(g). Thus, the Commission is authorized to require reimbursement for expenses incurred in defending its action on the pending CDP application. Therefore, consistent with Section 30620(c), the Commission imposes **Special Condition 7**, requiring reimbursement of any costs and attorneys fees the Commission incurs "in connection with the defense of any action brought by a party other than the applicant challenging the approval or issuance of this permit."

The Commission finds that only as conditioned is the proposed project consistent with Section 30253 of the Coastal Act.

E. WATER QUALITY

Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

The Coastal Act contains policies that address development in or near coastal waters. The proposed project is located near coastal waters of the Pacific Ocean. No work is proposed in the water. All work will occur at least 100 feet inland of the shoreline. Sections 30230 and 30231 of the Coastal Act require the protection of biological productivity, public recreation, and marine resources. The permit is conditioned to protect these marine resources.

The primary objective of the Project is to eliminate the risk of a spill of the aging sewer pipeline and tunnel which are in a state of disrepair. The proposed installation of a new sewer pipeline and the retention of the existing sewer pipeline as a redundancy measure subject to use during repairs or emergencies will decrease the risk of a sewage leak onto the beach or into coastal waters. Additionally, the proposed enlargement and stabilization of the tunnel will decrease the risk of a tunnel collapse which could cause fractures or leaks to the sewage pipeline. Finally, the proposed realignment of the 740 feet of tunnel and sewer pipeline under South La Senda Drive will serve to protect the biological productivity of the area and the water quality of the Pacific Ocean by eliminating the risk of slope failure of the section of bluff where the tunnel and pipeline are currently aligned (see the Natural Hazards section of this report for more detail).

Due to the project's location near coastal waters, it is necessary to ensure that construction activities will be carried out in a manner that will not adversely affect water quality or marine resources. The potential adverse impacts to water quality and marine resources include discharges of contaminated runoff and sedimentation during construction and as a result of excavation and pouring of concrete for the repairs to five adits (tunnel accessways) and abandonment of two adits. The applicant has proposed a list of best management practices for the repairs and abandonments and for excavation and stabilization of the tunnel.

In order to prevent adverse impacts to marine waters from construction activities, the Commission imposes **Special Condition 4**, which requires that specific best management practices be implemented in order to ensure that water quality, biological productivity, and marine resources are protected as required by the Coastal Act. Only as conditioned will the proposed project ensure that marine resources and water quality are protected as required by Sections 30230 and 30231 of the Coastal Act.

F. PUBLIC ACCESS

Section 30210 of the Coastal Act states:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30211 of the Coastal Act states:

> *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

One of the basic goals stated in the Coastal Act is to maximize public access and recreation along the coast. The proposed project conforms with the Coastal Act policies which protect and encourage public access and recreational use of coastal areas.

The Three Arch Bay community, which is the area under the Commission's permit jurisdiction, is a gated community with no public access. The portion of South La Senda Drive where the realigned tunnel and sewer pipeline is proposed is a private street with no public access. The public may access the state tidelands below the coastal bluffs on the sandy beach, but only by sea. The proposed repair and abandonment of seven adits will occur at least 100 feet above the mean high tide line and will have no impact on public access or recreation below the mean high tide line. No construction staging areas are proposed within the Three Arch Bay area of Commission jurisdiction. Therefore, the Commission finds that as proposed the project does not conflict with the public access policies of the Coastal Act.

G. VISUAL RESOURCES

Section 30251 of the Coastal Act states:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local governments shall be subordinate to the character of its setting.*

Section 30251 of the Coastal Act requires that the scenic and visual resources of coastal areas be considered and protected as a resource of public importance. In addition, public views to and along the ocean and scenic coastal areas shall be protected. The proposed project involves the repair of five adits and the abandonment of two adits, which will be visible from the ocean and parts of the shoreline. However, the visual impact of the repairs and abandonments will be insignificant, and the removal of an existing sewer pipe which is currently exposed on the bluff face between an upland residence and Adit 23 will improve the visual character of the coastal bluff **(Exhibit 4)**.

All of the excavations and stabilizations of the tunnel will be completed underground, inside the coastal bluffs. Thus, the proposed new tunnel will have no effect on visual resources. However, the proposed realignment of the tunnel and sewer pipeline will eliminate the risk of future negative impacts to visual resources which could be caused by slope failure and exposure of the tunnel and sewer pipeline on the bluff face (see the Natural Hazards section of this report for more detail). The Commission finds that as proposed the project is consistent with section 30251 of the Coastal Act.

H. LOCAL COASTAL PROGRAM

Coastal Act section 30604(a) states that, prior to certification of a local coastal program (LCP), a coastal development permit can only be issued upon a finding that the proposed development is in conformity with Chapter 3 of the Act and that the permitted development will not prejudice the ability of the local government to prepare an LCP that is in conformity with Chapter 3. An LCP for the City of Laguna Beach was effectively certified on January 13, 1993 and the Commission approved a major amendment to the LCP in 2012. However, the proposed development is occurring within an area of deferred certification. Consequently, the standard of review is the Coastal Act and the City's LCP is used only as guidance. The proposed development is consistent with Chapter 3 of the Coastal Act and with the certified LCP for the area. Approval of the project will not prejudice the ability of the local government to prepare a Local Coastal Program for this area that is in conformity with the provisions of Chapter 3.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the California Code of Regulations requires Commission approval of a coastal development permit application to be supported by a finding showing the application, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The South Coast Water District is the lead agency for the purposes of CEQA review. As described previously in this report, after allowing time for public review and comment on a Draft Environmental Impact Report published in August 2010, the District certified the Final EIR on November 11, 2010. There were no challenges to the Final EIR. The District published an Addendum to the Final EIR in February 2013 and certified the Addendum on March 28, 2013. There were no challenges to the Addendum.

Furthermore, the proposed project has been conditioned in order to be found consistent with the Chapter 3 policies of the Coastal Act. Mitigation measures, in the form of special conditions, require the applicant to: 1) demonstrate that it has the authority to comply with all conditions of approval, 2) agree to conditions for repair and removal of the development, 3) agree that no shoreline protective device(s) shall ever be constructed to protect the development, 4) implement best management practices to minimize adverse impacts to water quality during construction and operation of the development, 5) comply with the requirements of the resource agencies, and 6) assume the risks of the development.

As conditioned, there are no feasible alternatives or additional feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, is the least environmentally damaging feasible alternative and complies with the applicable requirements of the Coastal Act to conform to CEQA.

Appendix A – Substantive File Documents

1. City of Laguna Beach Conditional Use Permit 13-1393, Design Review 13-1394, Local Coastal Development Permit 13-1142, and Conditional Use Permit No. 14-1042.
2. List of easements for the area subject to the proposed development (submitted by applicant).
3. CEQA documents including Draft EIR (August 2010), Final EIR (November 11, 2010), and Addendum to Final EIR (March 28, 2013).
4. Geotechnical Assessment by Lawson and Associates (August 9, 2010) and supplement (October 10, 2014).
5. Coastal Hazards Analysis by Geosoils Inc. (February 19, 2013) and supplement (October 2, 2014).
6. Response to Geotechnical Issues in Three Arch Bay by South Coast Water District (October 22, 2013).
7. Adit 25 Realignment Alternative Options by Hatch Mott MacDonald (October 12, 2012).

Vicinity Map: Tunnel Stabilization amd Sewer Pipeline Replacement Project, Laguna Beach

Exhibit 1
Application No. 5-14-1291
California Coastal Commission

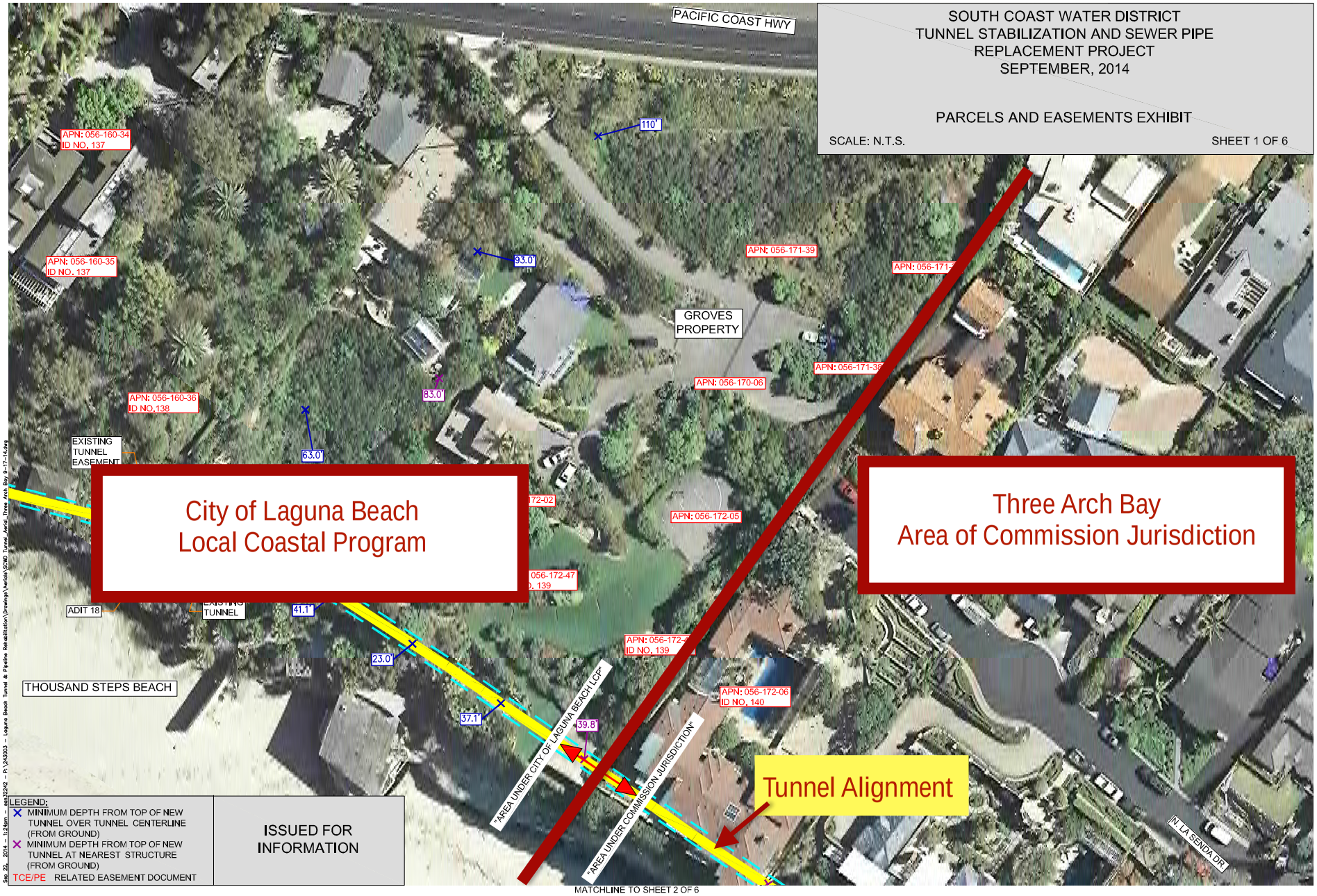

Exhibit 2 (Page 1 of 6)
Application No. 5-14-1291
California Coastal Commission

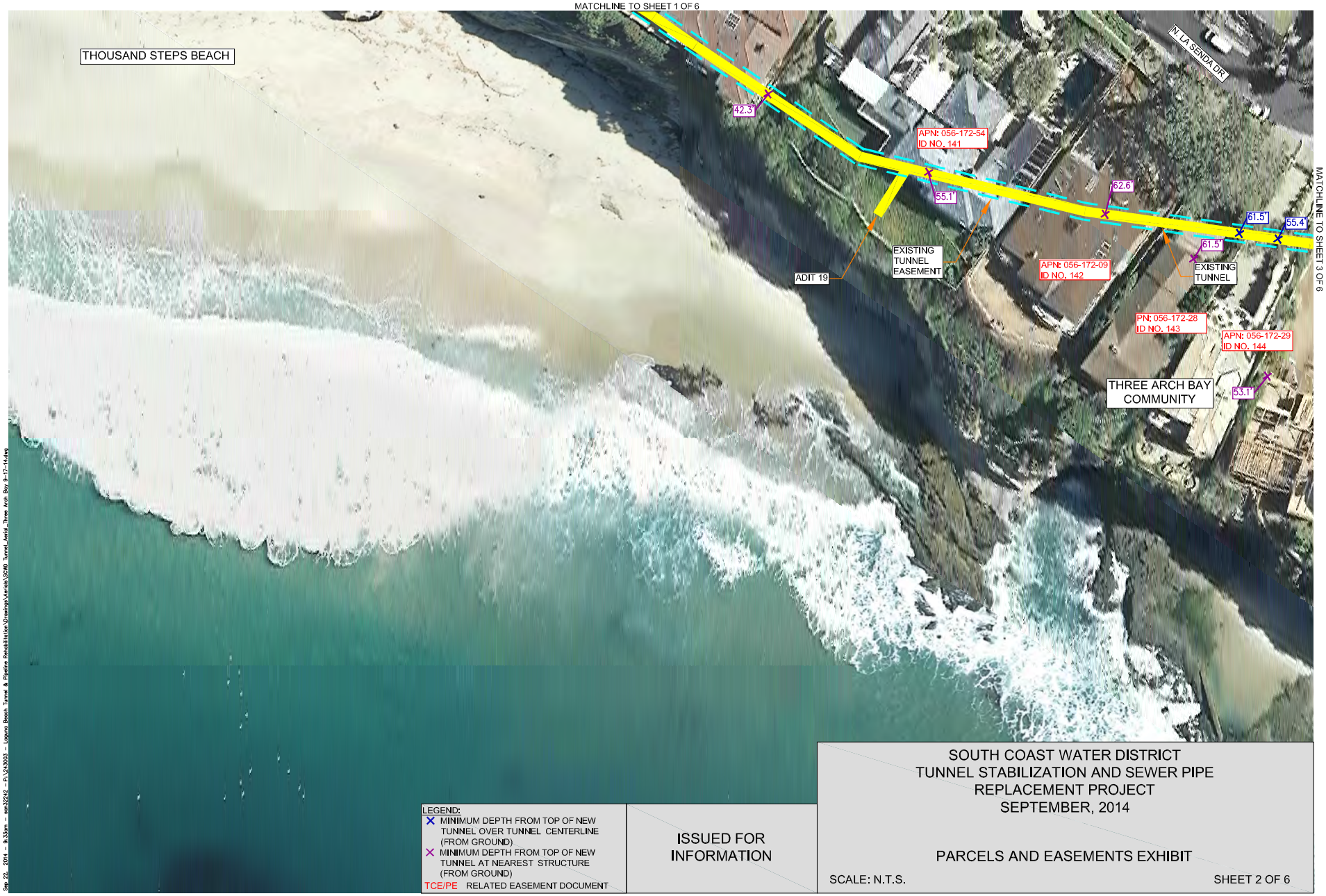

Exhibit 2 (Page 2 of 6)
Application No. 5-14-1291
California Coastal Commission

Exhibit 2 (Page 3 of 6)
Application No. 5-14-1291
California Coastal Commission

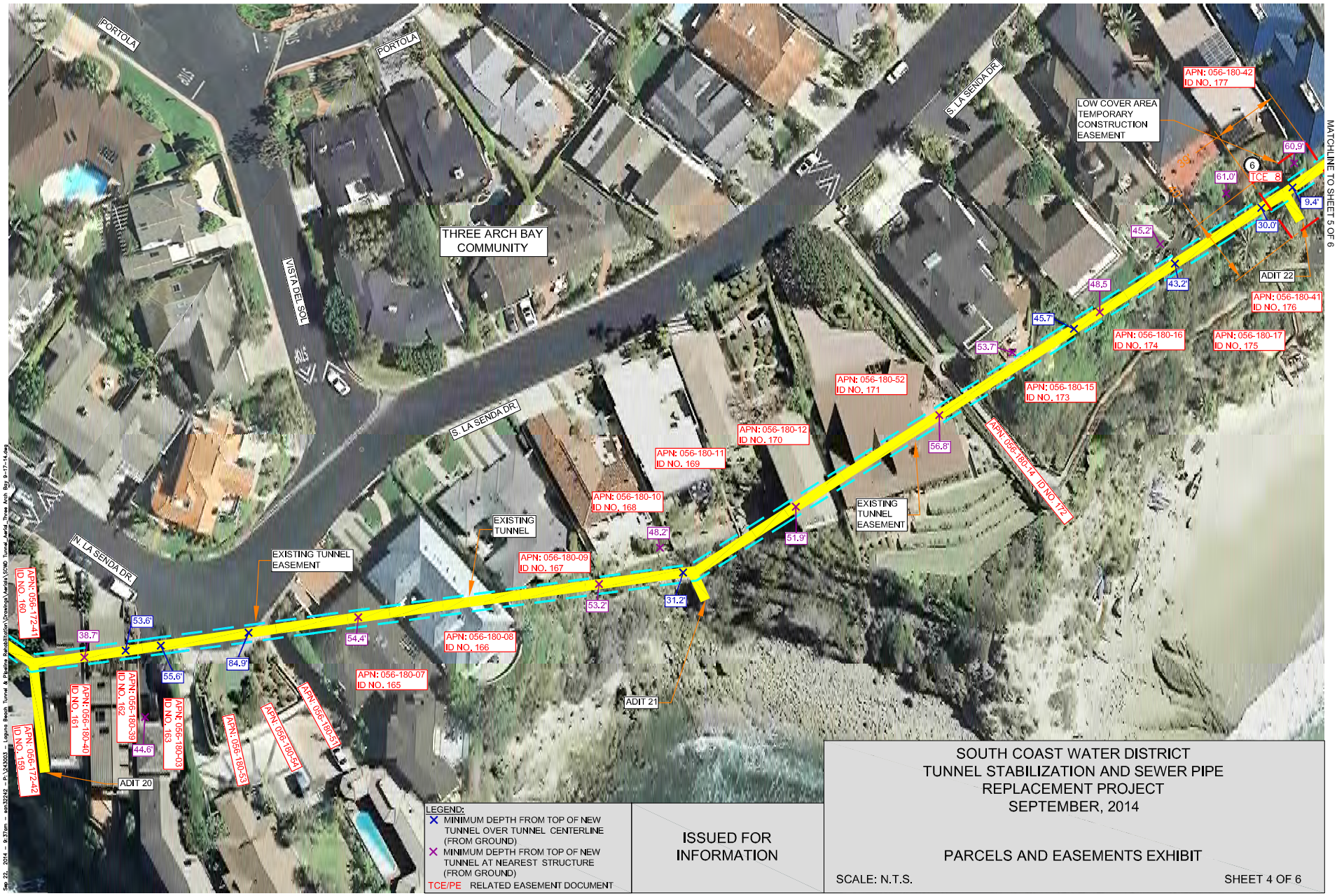

Exhibit 2 (Page 4 of 6)
Application No. 5-14-1291
California Coastal Commission

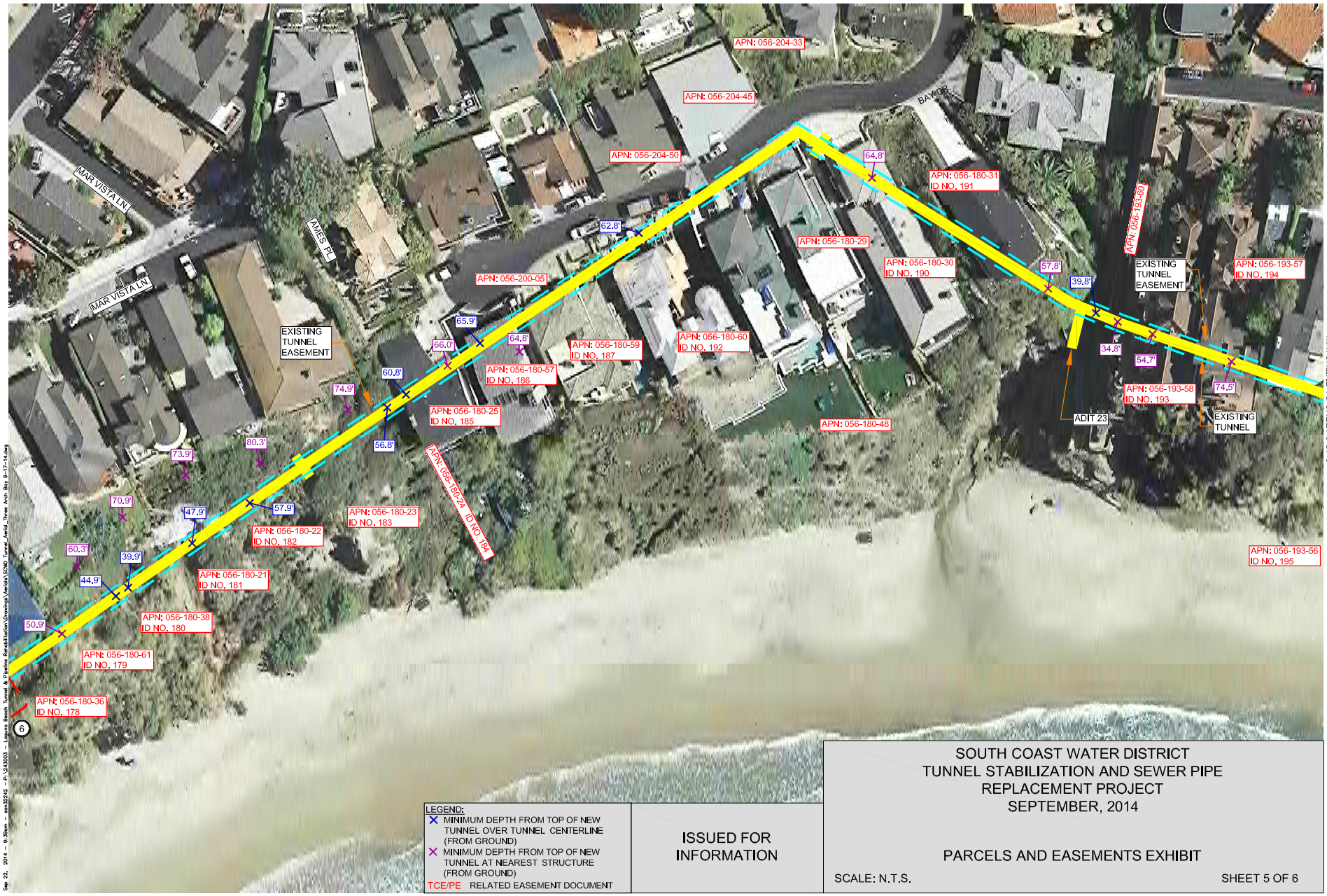

Exhibit 2 (Page 5 of 6)
Application No. 5-14-1291
California Coastal Commission

Exhibit 2 (Page 6 of 6)
Application No. 5-14-1291
California Coastal Commission

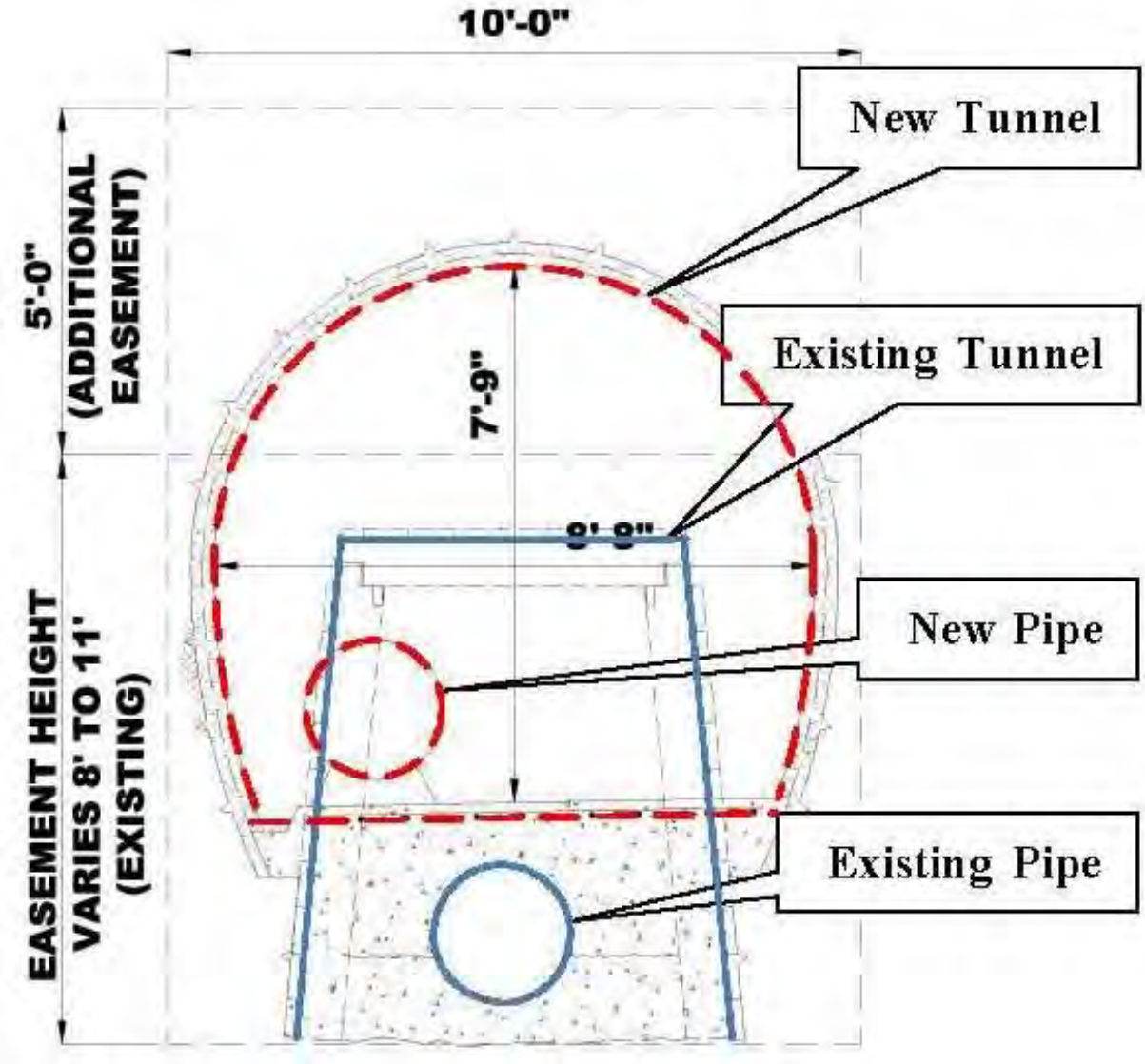

Exhibit 3
Application No. 5-14-1291
California Coastal Commission

Existing Appearance

Appearance After Construction

Figure 2.1-1. Artist's concept of the appearance of a typical adit after removal of a sewer connection and replacement of the adit door (Adit 24 shown).

Adit 23 Existing Appearance

Adit 23 Appearance After Construction

Figure 2.1-2. Artist's concept of the appearance of Adit 23 after removal of a sewer connection and replacement of the adit door.

Hatch Mott MacDonald

MEMO

To **Joseph McDivitt,**
Director of Operations
South Coast Water District

From Albert Ruiz, PE

Date October 12, 2012

Project # 243003

CC A. Haldin, D. Jurich

Subject **Adit 25 Realignment Alternative Options**

Introduction

The Beach Interceptor Sewer Tunnel was originally constructed in 1954 within the coastal bluffs of Laguna Beach. The current tunnel is mostly unsupported, with approximately 30% of the tunnel lined with timber ribs and lagging or shotcrete. The District must maintain access to the sewer pipe within the tunnel for maintenance and for the addition of future sewer lateral connections. The tunnel must also be stabilized in order to ensure the security of the existing pipeline and the safety of the maintenance personnel. As documented in the Full Tunnel Assessment Report completed by Hatch Mott MacDonald in 2007, the majority of the tunnel is in poor condition and in urgent need of repair. Stabilizing and enlarging the tunnel best addresses these criteria. The proposed tunnel stabilization removes the weathered and deteriorated rock surrounding the tunnel and supports it with shotcrete and steel ribs as required.

The District must maintain access to the 24-inch sewer interceptor pipeline (sewer main) within the tunnel for maintenance and for the addition of future sewer lateral connections. Access must be maintained to all of the existing sewer laterals for connection to the new sewer main that will be installed as part of the tunnel rehabilitation project and future maintenance of the sewer main and laterals. The tunnel must also be stabilized in order to ensure the security of the existing and new pipelines and the safety of the maintenance personnel. Stabilizing and enlarging the tunnel best addresses these criteria. As stated in Section 3.3 of the Environmental Impact Report (EIR), the proposed tunnel stabilization removes the weathered and deteriorated rock surrounding the tunnel and enlarges it to an approximately 9-foot diameter horseshoe shape and lines the new tunnel with 5 inches of steel fiber reinforced shotcrete. Areas with poor rock conditions will have a more robust liner installed that includes structural steel sets and a thicker layer of shotcrete. A new sewer main will be installed in the enlarged tunnel to replace the existing 24-inch diameter sewer main. The design life of the enlarged and rehabilitated tunnel is estimated to be 100 years.

Need for Realignment

The existing tunnel has no effect on the current slope stability in the vicinity of Adit 25, however future erosion or landslides due to storm events or earthquakes could possibly leave the tunnel exposed as there is approximately 20 feet of cover over the existing tunnel at several

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spots at this location. If the tunnel became exposed it could potentially cause a failure of the sewer main. In order to mitigate the possibility of the tunnel becoming exposed it is recommended that the tunnel be realigned inland and the existing tunnel be backfilled with cellular grout.

Two alternative alignments to accomplish this were developed and analyzed for feasibility. Alternative Realignment A would divert from the existing alignment at Sta. 115+81, pass underneath the residence at 90 South La Senda Drive, and then continue under the street of South La Senda to the drop manhole at the beginning of the existing tunnel. Alternative Realignment B would divert from the existing alignment at the angle point at Sta. 109+22 located beneath Bay Drive. This realignment would pass underneath the residence at 17 Bay Drive, continue under the streets of Barranca Way to South La Senda Drive, and then to the drop manhole at the beginning of the existing tunnel. Both alternative realignments are shown in Figure 1. A plan and cross section of the new and existing tunnel alignments is shown in Figure 2.

Existing Sewer Laterals

The most significant challenge to realigning the tunnel is maintaining service to the existing sewer laterals located south of the diversion point. There are twelve sewer laterals in the existing tunnel from the angle point at Sta. 109+22 to the end of the tunnel that will have to be connected to the new sewer main in either the existing tunnel or a new realigned tunnel. The furthest of these laterals is at Sta. 116+83, which is 761 feet from the diversion point. As part of the sewer tunnel stabilization project, the new 24-inch sewer main will be raised approximately 3-1/2 feet, which is the approximate level of the crown of the existing tunnel. If the laterals are collected in the existing tunnel they still need to be connected to the new pipe at the higher elevation. Furthermore, the laterals would be collected in a smaller 6-inch or 8-inch pipe, which would have greater slope requirements for proper sewage flow that would require approximately 4 feet of elevation drop over the 761 foot distance. Due to this, if the laterals are collected in the existing tunnel in this stretch of the alignment, the existing tunnel must be enlarged approximately 4 feet in height to meet the requirements for the sewer pipeline. Therefore, the existing laterals must be connected to the new realigned tunnel since it is recommended that the existing tunnel not be enlarged in the vicinity of Adit 25.

Possible Alternatives

Alternative methods of connecting the existing laterals to the new sewer main in the realigned tunnel in Barranca Way and South La Senda Drive (Alternative B) were analyzed and rejected for the following reasons. These new connections would have to be horizontal directionally drilled (HDD) using small scale equipment for distances up to 150 feet, either

a) from the ground surface to the tunnel, or

b) from the tunnel to the ground surface, accurate enough to hit a one square foot target or conventionally trenched.

Drilling from the ground surface: These existing laterals are already connected under the foundation or in the back yard of the residences and access to reconnect newly installed laterals will cause major disruption to property and potential damage to the house (e.g. excavating around house, demolishing and reconstructing walls, foundations, and landscaping) and disruption to the community. HDD technology can achieve the necessary distances and accuracy through rock, however drilling would have to be done from the surface and there is not enough room to stage the drill rig without the previously described damage and disruption.

Drilling from the tunnel: A HDD rig would be too large to use from the tunnel. A small auger boring machine (ABM) using Robbins Small Boring Units (SBU) could bore through rock with that accuracy from within the tunnel, however, drilling from the tunnel would cause major disruption at the ground surface where the lateral connection will be made in the home. Pilot tube boring could be used from within the tunnel and provides high enough accuracy, but is not suited to drilling through the boulders and hard rock of the San Onofre Breccia.

Trenching solution: Another option would be to re-plumb the laterals within the homes and then reroute them to Barranca Way and South La Senda Drive conventionally in trenches and installing new drop manholes and individual sump pumps at each residence. As with drilling from the surface, this would require extensive disruption and would most likely require closing down the streets for an extended period of time. Furthermore, this option will require excavating around the house, demolishing and reconstructing walls, foundations, walkways, and landscaping at each residence.

Summary of Alternatives

As there is no feasible method to connect the existing laterals to the new sewer main in the realigned tunnel, the existing laterals will need to be collected and extended to the realigned tunnel where it diverts from the existing tunnel and connected to the new sewer main as follows:

Alternative A: Laterals 68 through 79 will be connected to the new sewer main in the enlarged existing tunnel between Sta. 109+22 and Sta. 116+24 and include rehabilitation of 702 feet of existing tunnel. The tunnel will be realigned from Sta. 115+81 and include 720 feet of new tunnel.

New Tunnel Alignment	720 LF
Rebuilt Existing Tunnel	702 LF
Total Alt. A Tunnel Footage	1,422 LF

Alternative B: Alternative B requires enlarging 702 feet of the existing tunnel to connect existing laterals numbers 68 through 79 to the new sewer main and construction of 1,310 feet of new tunnel under Barranca Way and South La Senda Drive to the drop manhole at the beginning of the tunnel.

New Tunnel Alignment	1310 LF
Rebuilt Existing Tunnel	702 LF
Total Alt. B Tunnel Footage	2,012 LF

Both realignments would require one additional private property 10 ft wide by 10 ft high subsurface easement.

Both realignment alternatives will result in the section of existing tunnel in the area with the possible slope stability issue south of Sta. 116+24 to be bulkheaded and backfilled with cellular grout.

Recommendation

Realignment Alternative A is recommended because it requires the least amount of new realigned tunnel, fewer lateral modifications and significantly less disruption to the individual property owners as well as the community of Three Arch Bay.

South Coast Water District

Tunnel Stabilization and Sewer Pipeline Replacement Project

Review of Realignment Alternatives Near Adit 25 (90 South La Senda)

	Alternative A	Alternative B
New Tunnel (ft)	720	1310
Reconstructed Tunnel (ft)	702	702
Total Reconstructed & New Tunnel (ft)	1,422	2,012
Length of avoided unstable bluff (ft)	462	462
Length of existing tunnel remaining in bluff (ft)	702	702
Number of new easements from homeowners	1	1
Within an unstable bluff?	No	No
Safer?	Yes, shorter tunnel and only one sewer pipeline	No, 590 feet of additional tunnel & 2 sewer lines
Lateral connections	No change	12 laterals will flow into small sewer pipeline with 702 feet of low gradient, low flow, & low velocity
Sewer break route to beach	Adits 22, 23, 24	Adits 22, 23, 24
Adit access for maintenance & ventilation	Adit 23 & Adit 24	No adit access to main tunnel under S La Senda
Distance from start of tunnel to first adit	935	1,513
Additional construction time	0	4-6 months

LEGEND:

- ALTERNATIVE A TUNNEL REALIGNMENT (RECOMMENDED AND ADOPTED IN ADDENDUM TO FINAL EIR)
- AREA OF TUNNEL TO BE BACKFILLED
- EXISTING AREA OF BACKFILLED TUNNEL
- EXISTING TUNNEL TO BE ENLARGED

SITE PLAN
SCALE: 1"=40'-0"

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)

REV	DATE	Description

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

THIS DOCUMENT REPRESENTS WORK IN PROGRESS. THE INFORMATION PRESENTED HEREIN IS SUBJECT TO CHANGE AND HAS NOT BEEN COMPLETELY COORDINATED, NOR DOES IT NECESSARILY REPRESENT ACCEPTED DESIGN.

Hatch Mott MacDonald

PREPARED: DATE:

FOR INFORMATION ONLY

South Coast Water District

REVIEWED: DATE:

TUNNEL STABILIZATION AND SEWER PIPELINE REPLACEMENT PROJECT

ALTERNATIVE A

DR RS	DES AR	CK ACH	SHEET NO	TOTAL SHEETS	REV #
DATE	DATE	DATE			
DRAWING FILE NAME. EXHIBIT A			1	3	

LEGEND:

- ALTERNATIVE B TUNNEL REALIGNMENT (NOT RECOMMENDED)
- AREA OF TUNNEL TO BE BACKFILLED
- EXISTING AREA OF BACKFILLED TUNNEL
- EXISTING TUNNEL TO BE ENLARGED

SITE PLAN
SCALE: 1"=40'-0"

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)

REV	DATE	Description

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Hatch Mott MacDonald

APPROVED: DATE:

FOR INFORMATION ONLY

South Coast Water District

REVIEWED: DATE:

TUNNEL STABILIZATION AND SEWER PIPELINE REPLACEMENT PROJECT

ALTERNATIVE B

DR RS	DES AR	CK ACH	SHEET NO	TOTAL SHEETS	REV #
DATE	DATE	DATE	2	3	

DRAWING FILE NAME.
EXHIBIT B

Nov 21, 2013 - 8:46am - san32242 - P:\243003 - Laguna Beach Tunnel & Pipeline Rehabilitation\Drawings\Struct\Exhibits\Realignment\La-Senda_Realignment_Exhibit B.dwg