

Attachment E

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WASTE GENERATION AND DISPOSAL

INTRODUCTION

E&B Natural Resources Management Corporation, the Applicant, is proposing the development of the E&B Oil Development Project (proposed project) on a 1.3-acre project site located at 555 6th Street in the City of Hermosa Beach (City). The project site is bounded on the east by Valley Drive and on the south by 6th Street, approximately seven blocks east of the beach and the Pacific Ocean. The project site is owned by the City and is currently used as their City Maintenance Yard. The Project Applicant will lease the project site from the City for the implementation of the proposed project.

The proposed project provides for the development of an onshore drilling and production site that would utilize directional drilling of 30 wells to access the oil and gas reserves in the tidelands (granted by the State of California to the City) and in an onshore area known as the uplands. Both of these areas are located within the Torrance Oil Field. In addition, the proposed project would result in the drilling of four water injection wells, relocation of the City Maintenance Yard to another site, and the installation of offsite underground pipelines for the transport of the processed crude oil and gas from the project site to purchasers.

The offsite underground pipeline for the transport of oil to a valve box location in the City of Torrance would be constructed for a maximum distance of approximately 3.55 miles in one of three pipeline scenarios that would transverse through the Cities of Hermosa Beach, Redondo Beach, and Torrance. The pipeline would be 8 inches or less in diameter, located at a depth of 3.5 to 4 feet below ground surface depending on the grade.

WASTE GENERATED BY PHASE

The proposed project would occur in four phases consisting of the following:

- Phase 1: Site Preparation
- Phase 2: Drilling and Testing
- Phase 3: Final Design and Construction
- Phase 4: Development and Operations

The following is provided for each phase of the proposed project: the estimated waste generated; the disposal facilities that would be provided on the project site; and the anticipated disposal providers and their respective disposal facilities.

Phase 1: Site Preparation

The purpose of Phase 1 would be to prepare the project site for drilling and testing as well as the subsequent phases of the proposed project. It is anticipated that Phase 1 would occur for a period

of approximately six months. Refer to the attached table for the sources and types of the estimated waste that would be generated during Phase 1 and the potential disposal providers and their respective disposal facilities. During the site preparation process, waste would be disposed of through the use of bins and vehicles. No specific waste disposal facilities would be provided on the project site during this phase. The waste generated by Phase 1 would be disposed of consistent with the City's Construction and Demolition Waste Reduction Plan requirements.

Phase 2: Drilling and Testing

The purpose of Phase 2 would be to conduct the drilling and testing of wells in order to determine the potential productivity and economic viability of the proposed project. During this phase, up to three test wells and one water disposal/injection well would be drilled. These wells would be drilled utilizing directional drilling technology, which enables the wells to be drilled laterally for long distances, so that the bottom-hole locations may be located several thousand feet from the surface location of each well head on the project site. It is anticipated that Phase 2 would occur for approximately 12 months.

Refer to the attached table for the sources and types of the estimated waste that would be generated during Phase 2 and the potential disposal providers and their respective disposal facilities. As indicated in the table, municipal waste generated during Phase 2 would be removed from the project site by the City's franchise waste hauler, Athens Services (contract effective as of July 1, 2013). The municipal waste generated at the project site would be primarily associated with the activities at the temporary office trailer located on the northeastern corner of the project site. Containers would be provided for office trash, trash generated by the employees, and waste to be recycled. Based on a project-specific waste removal program developed with the Applicant, Athens Services would define the size of containers along with the waste removal frequency, process, and locations.

Drill cuttings, waste mud, and other waste would be stored within the tanks associated with the drill rig equipment until this material would be removed from the project site by the disposal company. In addition, typical oil field waste would be stored in waste bins until it is removed from the project site by the disposal company.

Phase 3: Final Design and Construction

The purpose of Phase 3 would be to utilize the production information from Phase 2 to prepare the final design of the facility, prepare the final drilling program, procure the equipment, conduct site remediation and final grading of the project site, and construct the permanent oil and gas production facilities, and other supporting onsite and offsite improvements for the proposed project. It is anticipated that Phase 3 would occur for a period of approximately 14 months.

Refer to the attached table for the sources and types of the estimated waste that would be generated during Phase 3 and the potential disposal providers and their respective disposal facilities. During the final design and construction of the onsite facilities for the proposed project, waste would be disposed of through the use of bins and vehicles. No specific waste disposal facilities would be provided on the project site during this phase. The waste generated

by Phase 3 would be disposed of consistent with the City's Construction and Demolition Waste Reduction Plan requirements.

The contaminated soil on the project site is not considered to be waste material. The soil remediation process for the project site is address in the Remedial Action Plan provided in Appendix G to the Planning Application. Refer to that document for a detailed discussion.

Phase 4: Development and Operations

The purpose of Phase 4 would be to maximize oil and gas recovery from the reservoirs by drilling additional wells and activating the permanent facility. To accomplish this, Phase 4 would result in: the drilling of the remaining wells (for a total of 30 oil and gas wells and four water disposal/injection wells); the start up and operation of the permanent oil production equipment; the transport of the oil and gas by pipeline to their respective destinations; and the ongoing maintenance of the proposed project. The proposed project would be designed for a maximum capacity of 8,000 barrels of oil per day and 2.5 million cubic feet of gas per day. It is anticipated that Phase 4 would occur for a period of approximately 30 to 35 years.

Refer to the attached table for the sources and types of the estimated waste that would be generated during Phase 4 and the potential disposal providers and their respective disposal facilities. Similar to Phase 2, the municipal waste generated at the project site would be primarily associated with the activities at the small office building located on the northeastern corner of the project site. Containers would be provided for office trash, trash generated by the employees, and waste to be recycled. Based on a project-specific waste removal program developed with the Applicant, Athens Services will define the size of containers along with the waste removal frequency, process, and locations for Phase 4.

Drilling of the remaining wells would occur for approximately 30 days for each well. During the drilling process in Phase 4, drill cuttings, waste mud, and other waste would be stored within the tanks associated with the drill rig equipment until this material would be removed from the project site by the disposal company. In addition, typical oil field waste would be stored in waste bins until it is removed from the project site by the disposal company.

**E&B OIL DEVELOPMENT PROJECT
WASTE GENERATION BY PHASE**

ESTIMATED WASTE GENERATED		POTENTIAL DISPOSAL LOCATION(S) ²	OTHER NOTES
SOURCE/TYPE	QUANTITY ¹		
Phase 1: Site Preparation			
Municipal Waste (paper, cups, food, etc.)	4 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside.
Removal of existing buildings (excluding foundations)	740 tons	Recycling facility at Southern California Disposal (1908 Frank Street, Santa Monica, CA 90404)	Prior to the demolition of the building on the eastern portion of the project site, the building materials would be assessed for asbestos containing materials (ACMs) consistent with the requirements of the South Coast Air Quality Management District (SCAQMD). If ACMs are detected, the building material would be removed by an asbestos abatement contractor and transported by a hazardous waste hauler to an approved disposal facility. With the exception of the potential building material with ACMs, it is assumed that the materials would be recycled for reuse and minimal disposal would be required.
Removal of existing building foundations (concrete)	410 tons	Recycling facilities at Hanson Aggregates (6956 Cherry Avenue, Long Beach, CA 90805) or CalMat Company (339 S. Aviation, El Segundo, CA 90245)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Removal of existing asphalt	790 tons	Recycling facilities at Hanson Aggregates (6956 Cherry Avenue, Long Beach, CA 90805) or CalMat Company (339 S. Aviation, El Segundo, CA 90245)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Removal of existing concrete	90 tons	Recycling facilities at Hanson Aggregates (6956 Cherry Avenue, Long Beach, CA 90805) or CalMat Company (339 S. Aviation, El Segundo, CA 90245)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Removal of existing crushed miscellaneous base material	150 tons	Recycling facility at Southern California Disposal (1908 Frank Street, Santa Monica, CA 90404)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Removal of existing masonry walls and footings	250 tons	Recycling facility at Southern California Disposal (1908 Frank Street, Santa Monica, CA 90404)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Removal of miscellaneous materials	25 tons	Recycling facilities at Southern California Disposal (1908 Frank Street, Santa Monica, CA 90404) or American Waste Transfer Station (1449 Rosecrans Avenue, Gardena, CA 90249)	It is assumed that the materials would be recycled for reuse and minimal disposal would be required.
Removal of one existing tree	1 truck load	Tree removal contractor would use a chipper to reduce the plant materials and transport it to a mulch/compost facility	It is assumed that the green waste would be recycled for reuse and no disposal would be required.
Construction waste	8 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled and minimal disposal would be required.

**E&B OIL DEVELOPMENT PROJECT
WASTE GENERATION BY PHASE (CONTINUED)**

ESTIMATED WASTE GENERATED		POTENTIAL DISPOSAL LOCATION(S) ²	OTHER NOTES
SOURCE/TYPE	QUANTITY ¹		
Phase 2: Drilling and Testing			
Municipal Waste (paper, cups, food, etc.)	8 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside.
Recycled waste (wood pallets, cardboard, plastics)	20 cubic yards/week	Collection by the City's waste hauler Athens Services and recycled at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled and minimal disposal would be required.
Drill Cuttings	1,000 tons	Anterra's Oxnard Licensed Class 2 Disposal Facility (1933 East Wooley Road, Oxnard, CA 93030)	Disposal would comply with the following 1993 Condition of Approval: Drill cuttings and other wastes, shall be collected in above ground containers and disposed of at an approved disposal site. Receipts for all disposal of waste product shall be provided within ten (10) days of disposal to the Public Works Director. (CUP Condition of Approval, Section 1-General, No. 8)
Waste mud and other liquids	8,400 barrels	Anterra's Oxnard Licensed Class 2 Disposal Facility (1933 East Wooley Road, Oxnard, CA 93030 or Santa Clara Waste Water Company (815 Mission Rock Road, Santa Paula, CA 93060)	Disposal would comply with the following 1993 Condition of Approval: Both solid and liquid wastes shall be sampled and tested to determine if it needs to be treated as a hazardous waste. (CUP Condition of Approval, Section 3-Public Safety, No. 7)
Typical oil field waste (oily cloths, spent filters, etc.)	4 cubic yards/week	Clean Harbors Buttonwillow Landfill (2500 West Lokem Road, Buttonwillow, CA 93206) or similar facility if closer to project site	Disposal would comply with the following 1993 Condition of Approval: Oily rags, paper and miscellaneous waste shall be disposed of in an appropriate manner to reduce fire hazards. (CUP Condition of Approval, Section 4-Fire Safety, No. 4)
Hazardous wastes (empty drums, rinsate, chemicals, spent media, hydraulic fluids)	----- ³	----- ³	It is assumed that no disposal of hazardous wastes would be required.
Phase 3: Final Design and Construction (Construction of Onsite Facilities)			
Municipal Waste (paper, cups, food, etc.)	20 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and/or operates eight transfer stations and material recovery facilities in the Counties of Los Angeles and Ventura and owns the Sunshine Canyon Landfill located at 14747 San Fernando Road, Sylmar, CA 91342.
Removal of three existing trees	4 truck loads	Tree removal contractor would use a chipper to reduce the plant materials and transport it to a mulch/compost facility	It is assumed that the green waste would be recycled for reuse and no disposal would be required.
Remove temporary landscape materials not reused	2 truck loads	Trees and shrubs would be stored and reused to the extent feasible in permanent landscaping in Phase 3	It is assumed that any remaining green waste would be recycled for reuse and no disposal would be required.
Construction waste	80 tons	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled and minimal disposal would be required.

**E&B OIL DEVELOPMENT PROJECT
WASTE GENERATION BY PHASE (CONTINUED)**

ESTIMATED WASTE GENERATED		POTENTIAL DISPOSAL LOCATION(S) ²	OTHER NOTES
SOURCE/TYPE	QUANTITY ¹		
Phase 3: Final Design and Construction (Construction of Offsite Pipeline)			
Asphalt	2,200 tons	Recycling facilities at Hanson Aggregates (6956 Cherry Avenue, Long Beach, CA 90805); CalMat Company (339 S. Aviation, El Segundo, CA 90245)	It is assumed that the materials would be recycled for reuse and no disposal would be required.
Dirt	7,000 cubic yards	Contractor constructing the oil and gas pipelines would provide for the disposal of the dirt. It is assumed that if it is clean dirt, it would be sold for fill material.	It is assumed that no disposal would be required.
Construction waste	Nominal	The nominal amount of waste generated would be removed by the construction contractor and recycled as appropriate	It is assumed that the materials would be recycled and minimal to no disposal would be required.
Phase 4: Development and Operations (During Drilling)			
Municipal Waste (paper, cups, food, etc.)	8 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside.
Construction waste	4 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled and minimal disposal would be required.
Recycled waste (wood pallets, cardboard, plastics)	20 cubic yards/week	Collection by the City's waste hauler Athens Services and recycled at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled and minimal disposal would be required.
Drill cuttings	7,500 tons	Anterra's Oxnard Licensed Class 2 Disposal Facility (1933 East Wooley Road, Oxnard, CA 93030)	Disposal would comply with the following 1993 Condition of Approval: Drill cuttings and other wastes, shall be collected in above ground containers and disposed of at an approved disposal site. Receipts for all disposal of waste product shall be provided within ten (10) days of disposal to the Public Works Director. (CUP Condition of Approval, Section 1-General, No. 8)
Waste mud and other liquids	63,000 barrels	Anterra's Oxnard Licensed Class 2 Disposal Facility (1933 East Wooley Road, Oxnard, CA 93030) or Santa Clara Waste Water Company (815 Mission Rock Road, Santa Paula, CA 93060)	Disposal would comply with the following 1993 Condition of Approval: Both solid and liquid wastes shall be sampled and tested to determine if it needs to be treated as a hazardous waste. (CUP Condition of Approval, Section 3-Public Safety, No. 7)
Typical oil field waste (oily cloths, spent filters, etc.)	4 cubic yards/week	Clean Harbors Buttonwillow Landfill (2500 West Lokem Road, Buttonwillow, CA 93206) or similar facility if closer to project site	Disposal would comply with the following 1993 Condition of Approval: Oily rags, paper and miscellaneous waste shall be disposed of in an appropriate manner to reduce fire hazards. (CUP Condition of Approval, Section 4-Fire Safety, No. 4)
Hazardous wastes (empty drums, rinsate, chemicals, spent media, hydraulic fluids)	----- ³	----- ³	It is assumed that no disposal would be required.

**E&B OIL DEVELOPMENT PROJECT
WASTE GENERATION BY PHASE (CONTINUED)**

ESTIMATED WASTE GENERATED		POTENTIAL DISPOSAL LOCATION(S) ²	OTHER NOTES
SOURCE/TYPE	QUANTITY ¹		
Phase 4: Development and Operations (During Ongoing Operations and Maintenance)			
Municipal Waste (paper, cups, food, etc.)	4 cubic yards/week	Collection by the City's waste hauler Athens Services and disposal at one of their contracted facilities (see other notes)	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside.
Recycled waste (wood pallets, cardboard, plastics)	4 cubic yards/week	Collection by the City's waste hauler Athens Services and recycled at one of their contracted facilities	Athens Services owns and operates the Athens Services Transfer Station/Materials Recovery Facility (14048 Valley Boulevard, City of Industry, CA 91746). The transfer stations, materials recovery facilities, and solid waste disposal sites, per the City contract, are located in the Counties of Los Angeles, San Bernardino, and Riverside. It is assumed that the materials would be recycled for reuse and minimal disposal would be required.
Typical oil field waste (oily cloths, spent filters, etc.)	20 cubic yards/6 months	Clean Harbors Buttonwillow Landfill (2500 West Lokem Road, Buttonwillow, CA 93206) or similar facility if closer to project site	Disposal would comply with the following 1993 Condition of Approval: Oily rags, paper and miscellaneous waste shall be disposed of in an appropriate manner to reduce fire hazards. (CUP Condition of Approval, Section 4-Fire Safety, No. 4)
Hazardous wastes (empty drums, rinsate, chemicals, spent media, hydraulic fluids)	---- ³	----- ³	It is assumed that no disposal would be required.

Prepared by E&B Natural Resources Management Corporation, April 11, 2013.

¹ Unless otherwise indicated, the quantity is for the entire duration of the phase of the proposed project.

² These are the disposal locations that can be identified at this time. The waste haulers may identify another appropriate disposal location based on contractual agreements in place at the initiation of service.

³ No hazardous wastes are expected to occur. In the event that hazardous wastes are generated, the amount would be nominal and picked up by the manufacture or provider of the material for reuse.