NOISE IMPACT ANALYSIS

TALBERT EXTRACTION WELL DECOMMISSIONING PROJECT

CITY OF HUNTINGTON BEACH

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSB	Oriented Strand Board
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
UMTA	Federal Urban Mass Transit Administration
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Talbert Extraction Well Decommissioning project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Proposed Project Description

The proposed project involves the destruction and permanent decommissioning of seven (7) extraction wells including demolition of the associated structures and pipeline and construction and operation of one (1) new monitoring well within the City of Huntington Beach (City).

1.3 Project Component Locations

The regional location of the seven inactive extraction wells, water supply pipeline alignments, and one proposed monitoring well are shown in Figure 1. Four of the extraction wells (OCWD-P1 through P-4) along with a 24" pipeline are located within the right of way (ROW) of Adams Avenue west of the Talbert Channel. Extraction well OCWD-P6 is located within a paved maintenance road along the Talbert Channel near the Indianapolis Avenue overcrossing. Extraction well OCWD-P7 is located along Bushard Street ROW north of Atlanta Avenue and is accompanied by a 10" pipeline that extends within Bushard Street south of the extraction well to Atlanta Avenue and extends within Atlanta Avenue west to the Talbert Channel. Extraction well OCWD-P10 is located adjacent to the paved bicycle path within the levee along the western bank of the Santa Ana River north of the Hamilton Avenue overcrossing. The proposed new monitoring well (OCWD-M57) would be located within the Galbar Circle ROW immediately north of the intersection with Dana Drive. Detailed information regarding the location and proposed construction activities for each of the project components is discussed below.

Extraction Well OCWD-P1

As shown on Figure 2, extraction well OCWD-P1 is located approximately 50 feet north of the centerline of Adams Avenue and 1,200 feet west of the centerline of Beach Boulevard (AKA Highway 39) in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 11 West and Section 1. The closest sensitive receptor would be residential land uses located approximately 20 feet to the north.

Extraction Well OCWD-P2

As shown on Figure 3, extraction well OCWD-P2 is located on the northeast corner of Adams Avenue and Newland Street approximately 60 feet north of the centerline of Adams Avenue and 60 feet east of the centerline of Newland Street in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 11 West, and Section 1. The closest sensitive receptor would be residential land uses, located approximately 60 feet to the northeast.

Extraction Well OCWD-P3

As shown on Figure 4, extraction well OCWD-P3 is located on Adams Avenue (frontage road) approximately 70 feet north of the centerline of Adams Avenue and 1,000 feet west of Magnolia Avenue in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 11 West and Section 1. The closest sensitive receptor would be residential land uses, located approximately 45 feet to the north of the site.

Extraction Well OCWD-P4

As shown on Figure 5, extraction well OCWD-P4 is located on the south side of Adams Avenue approximately 55 feet south of the centerline of Adams Avenue and 500 feet east of the centerline of Magnolia Avenue in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 10 West and Section 7. The closest sensitive receptor would be residential land uses, located approximately 250 feet east of the site.

Extraction Well OCWD-P6

As shown on Figure 6, extraction well OCWD-P6 is located west of the Talbert Channel (D02) approximately 105 feet south of the centerline of Indianapolis Avenue and 1,200 feet east of the centerline of Magnolia Avenue in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 10 West and Section 7. The closest sensitive receptor would be residential land uses, located approximately 35 feet to the west.

Extraction Well OCWD-P7

As shown Figure 7, extraction well OCWD-P7 is located on the east side of Bushard Street 1,000 feet north of the centerline of Atlanta Avenue and 35 feet east of the centerline of Bushard Street in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 10 West and Section 7. The closest sensitive receptor would be residential land uses located approximately 25 feet to the east.

Extraction Well OCWD-P10

As shown Figure 8, extraction well OCWD-P10 is located on the west levee of the Santa Ana River (E01) approximately 860 feet east of the centerline of Brookhurst Street and 890 feet south or the terminus of Atlanta Avenue in the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 10 West and Section 17. The closest sensitive receptor would be residential land uses located approximately 265 feet to the west.

Water Supply Pipelines

The water supply pipelines are shown on Figure 1. The northwestern extent is oriented east-west along the southern edge of Adams Avenue between Beach Boulevard and the Talbert Flood Channel. The

southeast extent is oriented north-south along the eastern edge of Bushard Street and east-west along the northern edge of Atlanta Avenue. The southeast extent runs from OCWD-P7 to the Talbert Channel.

The abandonment period would be approximately 13 days including capping the northwest extent at approximately 7 locations and the southeast extent at approximately 3 locations. Water supply pipelines that are 12-inch in diameter or smaller will be capped and abandoned in place. Water supply pipelines larger than 12-inch diameter will be filled with sand and abandoned in place.

Extraction Well Vaults

Each existing extraction well includes a subsurface vault structure at the well head. The extraction well vaults are approximately 11-feet long by 7 feet-wide by 9-feet deep. After sealing the wells, the upper 3 feet of the vaults will be demolished and the bottom will be filled with slurry. Complete removal is not practical due to their proximity to sensitive structures (e.g. adjacent block walls, in city sidewalks, adjacent busy streets, and on flood control channels).

Monitoring Well OCWD-M57

As shown Figure 9, proposed monitoring well OCWD-M57 is located on the west side of Galbar Circle approximately 14 feet west of the centerline of Galbar Circle and 80 feet northeast of the centerline of Dana Drive within the City of Huntington Beach. The well site is located on USGS Newport Beach Quadrangle Map, Township 6 South, Range 10 West and Section 17. The closest sensitive receptor would be residential land uses located approximately 25 feet to the west. The construction period would be approximately one week.

1.4 Destruction and Construction Activities

The proposed destruction and construction activities would occur in four phases. Phase 1 of the Proposed Project involves properly destroying the extraction wells via perforating the blank well casings and sealing the wells with cement grout. Phase 2 involves filling and removal of the below-ground concrete well vaults. Phase 3 involves abandonment of the water supply pipeline. Phase 4 involves construction of the monitoring well. All destruction and construction operations would occur between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday or as otherwise specified in the City Encroachment Permits.

The decommissioning of each extraction well site would require the implementation of an approximate 10-foot wide by 50-foot long work area during well destruction work. During the night when destruction activities are not occurring, all equipment would be moved off site.

Well destruction work would take approximately one week per well for well sealing and approximately one week per well of vault demolition and concrete and asphalt repair. Abandonment and capping of the pipeline would take approximately 13 days to complete including pipeline abandonment and asphalt repair.

The new monitoring well site would require an approximate 20 foot wide by 50 foot long work area. During the night when construction activities are not occurring, all equipment would remain on site. Well construction work would take approximately one week to complete.

Phase 1: Extraction Well Destruction

Phase 1 of the proposed project involves properly destroying the extraction wells via perforating the blank well casings and sealing the wells with cement grout. The equipment mix for well destruction is shown in

Table A. Each of the proposed well destructions would occur in five steps; 1) provide traffic control, 2) seal the well screen with sand-cement grout, 3) perforate the upper blank well casing, 4) pressure grout the upper blank well casing, and 5) cap the well with concrete.

Table A – Extraction Well Destruction Equipment Mix

Activity	Equipment	Pieces of Equipment	Hours of Operation	Days of Operation	Horsepower
Well Destruction	Pump Rig	1	9	35	550
	Support Truck	1	4	35	350
	Cement Truck	1	4	7	300
	Cement Pumper	1	4	7	90
	Air Compressor	1	4	7	200
	Pick-up Truck	1	4	35	250

Construction Trips: 35 trips mobilizing, 35 trips demobilizing. All trips assumed 50 miles.
Source: OCWD.

Phase 2: Removal of Below-Ground Concrete Well Vaults

Phase 2 of the proposed project involves filling and removal of the below-ground concrete well vaults. The equipment mix for vault removal is shown in Table B. Each of the proposed well vault removals would occur in three steps; 1) demolish and remove the concrete vaults, 2) back-fill and compact, and 3) repair the concrete/asphalt adjacent the site.

Table B – Concrete Well Vault Removal Equipment Mix

Activity	Equipment	Pieces of Equipment	Hours of Operation	Days of Operation	Horsepower
Vault Removal	Backhoe	1	9	21	80
	Material Truck	1	3	21	300
	Water Truck	1	5	21	200
	Pick-up Truck	3	4	21	250

Construction Trips: 21 trips mobilizing, 21 trips demobilizing. All trips assumed 50 miles.
Source: OCWD.

Phase 3: Abandonment of the Water Supply Pipeline

Phase 3 of the proposed project involves abandonment of the water supply pipeline. The equipment mix for pipeline abandonment is shown in Table C. The proposed pipeline abandonment would occur in three steps; 1) excavate and cap the pipeline at ten locations, 2) fill 24-inch pipeline with sand-cement slurry, and 3) repair the asphalt at pipeline cap locations.

Table C – Water Supply Pipeline Abandonment Equipment Mix

Activity	Equipment	Pieces of Equipment	Hours of Operation	Days of Operation	Horsepower
Pipeline Abandonment	Backhoe	1	9	10	80
	Material Truck	1	4	10	300
	Asphalt Roller	1	4	8	150
	Cement Truck	1	6	4	300
	Cement Pumper	1	6	4	90
	Pick-up Truck	3	4	13	250

Construction Trips: 11 trips mobilizing, 11 trips demobilizing. All trips assumed 50 miles.
Source: OCWD.

Phase 4: Monitoring Well Construction

Phase 4 of the Proposed Project involves monitoring well construction. The equipment mix for monitoring well construction is shown in Table D. The proposed monitoring well construction would occur in three steps; 1) mobilization, borehole drilling, and well construction, 2) well development, and 3) demobilization, site clean-up, and vault installation. Step 3 involves minimal equipment and would be done by hand.

Table D – Monitoring Well Construction Equipment Mix

Activity	Equipment	Pieces of Equipment	Hours of Operation	Days of Operation	Horsepower
Well Construction	Air-Vac Truck	1	4	1	425
	Drilling Rig	1	9	3	550
	Mud Circulation System	1	9	3	75
	Support Truck	1	2	3	350
	Forklift	1	4	3	75
	Pump Rig	1	9	2	325
	Air Compressor	1	9	1	200
	Electrical Generator	1	3	1	20
	Pick-up Truck	2	4	5	250

Construction Trips: 1 trip mobilizing, 1 trip demobilizing. All trips assumed 50 miles.
Source: OCWD.

1.5 Project Schedule and Equipment Overlap

There will be no overlap of equipment for the various phases of this project. The estimated schedule includes 35 days for well destruction, 21 total days for vault removal, 13 days for pipeline abandonment, and 5 days for well construction. The total estimated Project duration is 74 days.

1.6 Monitoring Well Long-Term Operation and Maintenance Activities

Monitoring well operation involves periodically measuring the depth to groundwater, and collecting groundwater samples for laboratory analysis. The depth to groundwater would be measured by hand using a battery powered wire-line sounder. A submersible pump would be used for periodic sampling. Operation of a submersible pump would require the use of a small portable generator. OCWD staff would

collect groundwater samples and record water levels on a quarterly basis or less. In total, the monitoring well would be visited by OCWD staff up to 8 times per year. One truck and two workers would access each well site during sampling, assuming a round trip length of 40 miles per trip. One truck and one worker would access the well during collection of water levels, assuming a round trip length of 40 miles. Every three to five years OCWD would conduct maintenance activities to redevelop the well. Table E identifies the equipment required for well sampling and redevelopment. A typical monitoring well redevelopment process would be completed in one day. All sampling and redevelopment activities would occur during the day.

Table E – Monitoring Well Sampling and Redevelopment Equipment Mix

Activity	Equipment	Pieces of Equipment	Hours of Operation	Days of Operation	Horsepower
Sampling	Generator	1	4	1	20
Redevelopment	Pump Rig	1	9	1	325
	Air Compressor	1	9	1	200
	Pick-up Truck	1	2	1	300

Sampling & Redevelopment Trip: 1 round trip, all trips assumed 40 miles.
Source: OCWD.

1.7 Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City of Huntington Beach (City) and State of California (State).

City of Huntington Beach Municipal Code

The following lists the City of Huntington Beach Municipal Code regulations that are applicable to all development projects in the City.

Section 8.40.050 Exterior Noise Standards

Section 8.40.050 of the City's Municipal Code limits exterior noise impacts to all residential properties to 55 dBA from 7:00 a.m. to 10:00 p.m. and 50 dBA from 10:00 p.m. to 7:00 a.m.

Section 8.40.090(d) Construction Noise Standards

Section 8.40.090(d) of the City's Municipal Code exempts construction activities from the City's exterior noise standards provided that construction activities occur between 7:00 a.m. and 8:00 p.m. on weekdays and Saturdays.

State of California Noise Regulations

The following lists the State of California noise regulations that are applicable, but not limited to the proposed project.

- California Vehicle Code Section 2700-27207 – On Road Vehicle Noise Limits
- California Vehicle Code Section 38365-38350 – Off-Road Vehicle Noise Limits

1.8 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than significant impact.

Generation of excessive groundborne vibration or groundborne noise levels?

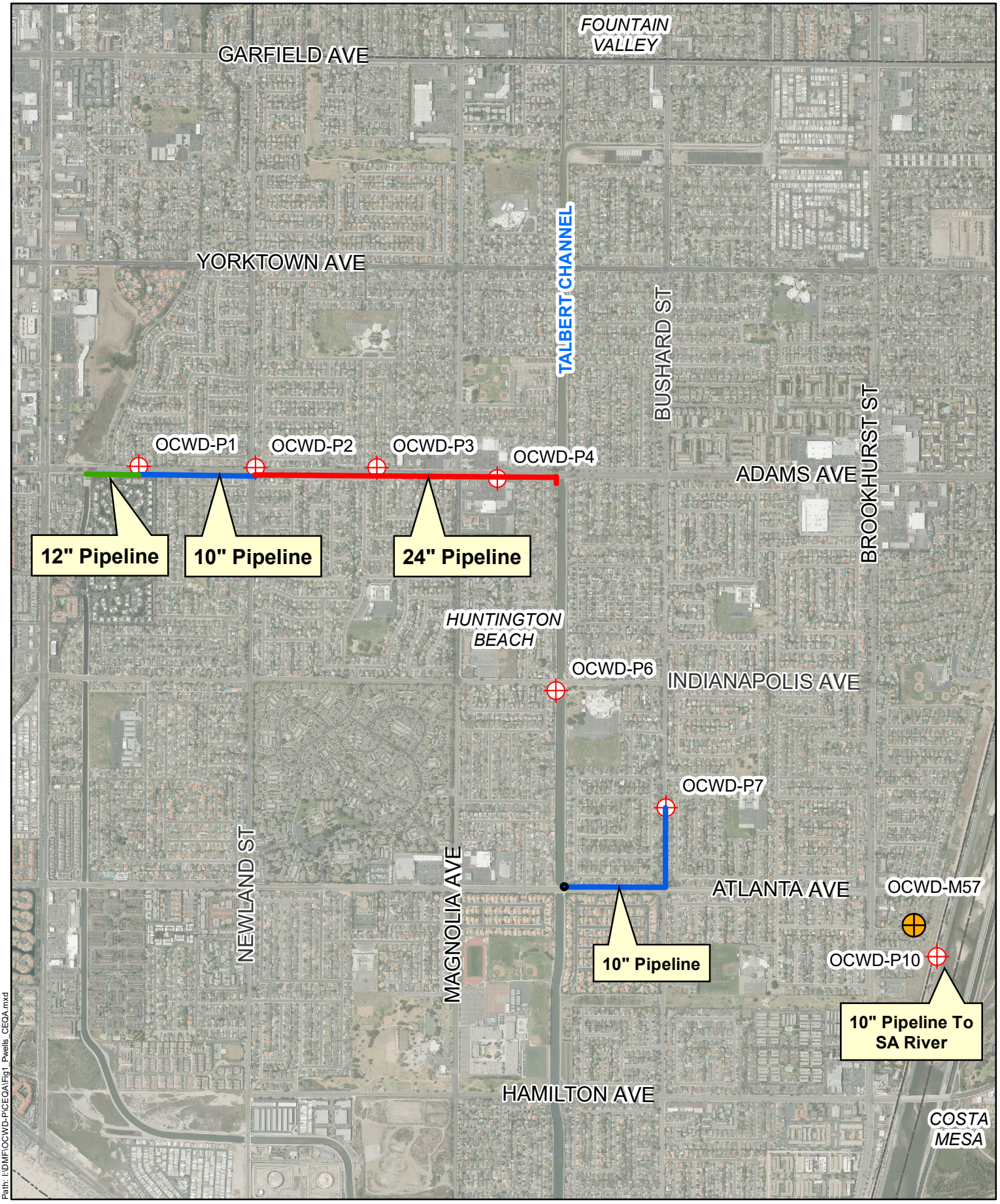
Less than significant impact.

For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No impact.

1.9 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.7 above were adequate to limit all noise and vibration impacts to less than significant levels. No mitigation measures are required for the proposed project with respect to noise and vibration impacts.



N
W
E
S

0 800 1,600 Feet

Talbert Barrier Extraction Well Destruction Project
Well & Pipeline Locations

Extraction Well Proposed Monitoring Well

Figure 1

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Well Location

Talbert Barrier Extraction Well destruction Project
OCWD-P1 Well Site

Figure 2

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Well Location

Talbert Barrier Extraction Well Destruction Project
OCWD-P2 Well Site

Figure 3

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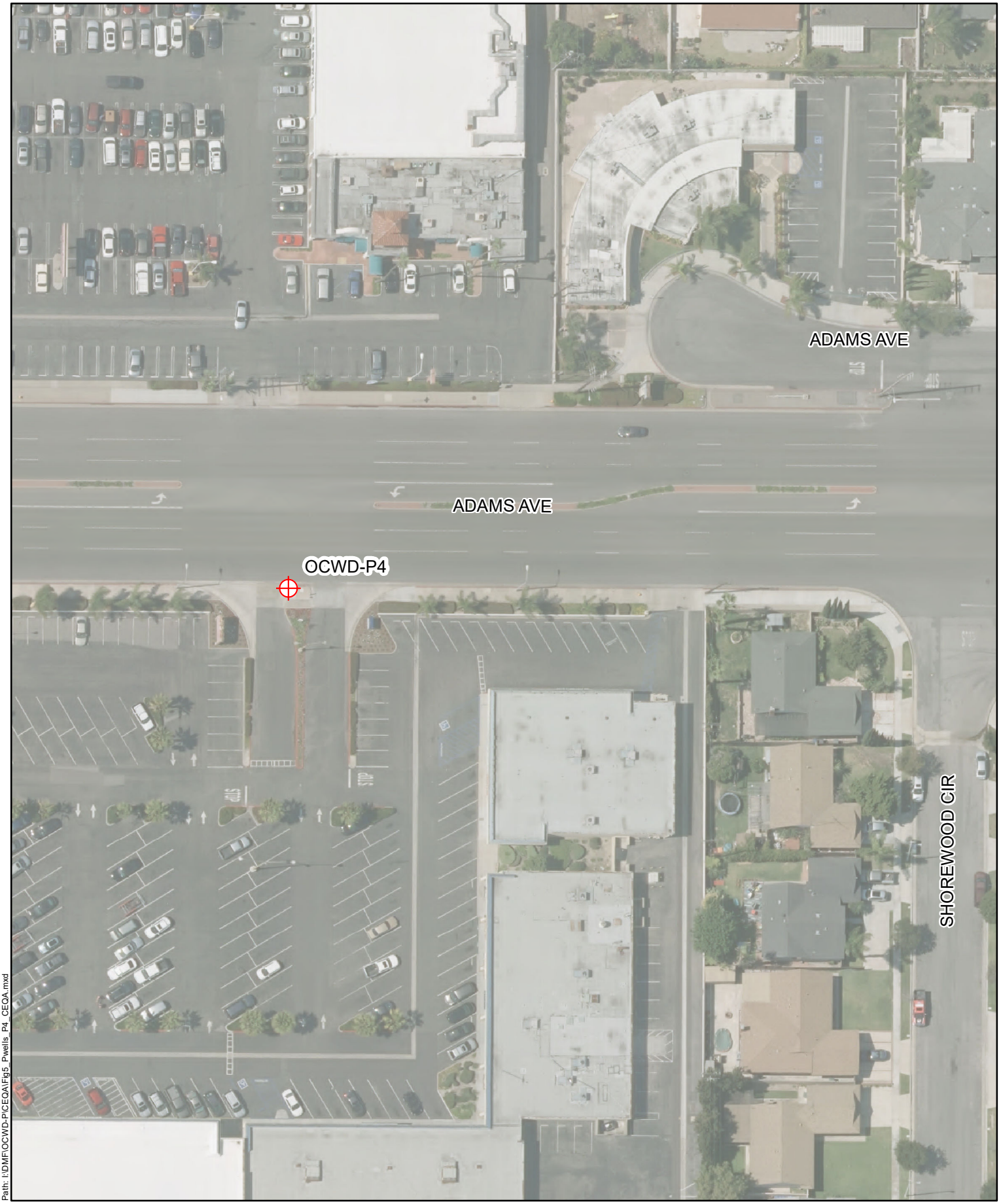
Feet

Well Location

Talbert Barrier Extraction Well Project
OCWD-P3 Well Location

Figure 4



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Well Location

Talbert Barrier Extraction Well Destruction Project
OCWD-P4 Well Site

Figure 5

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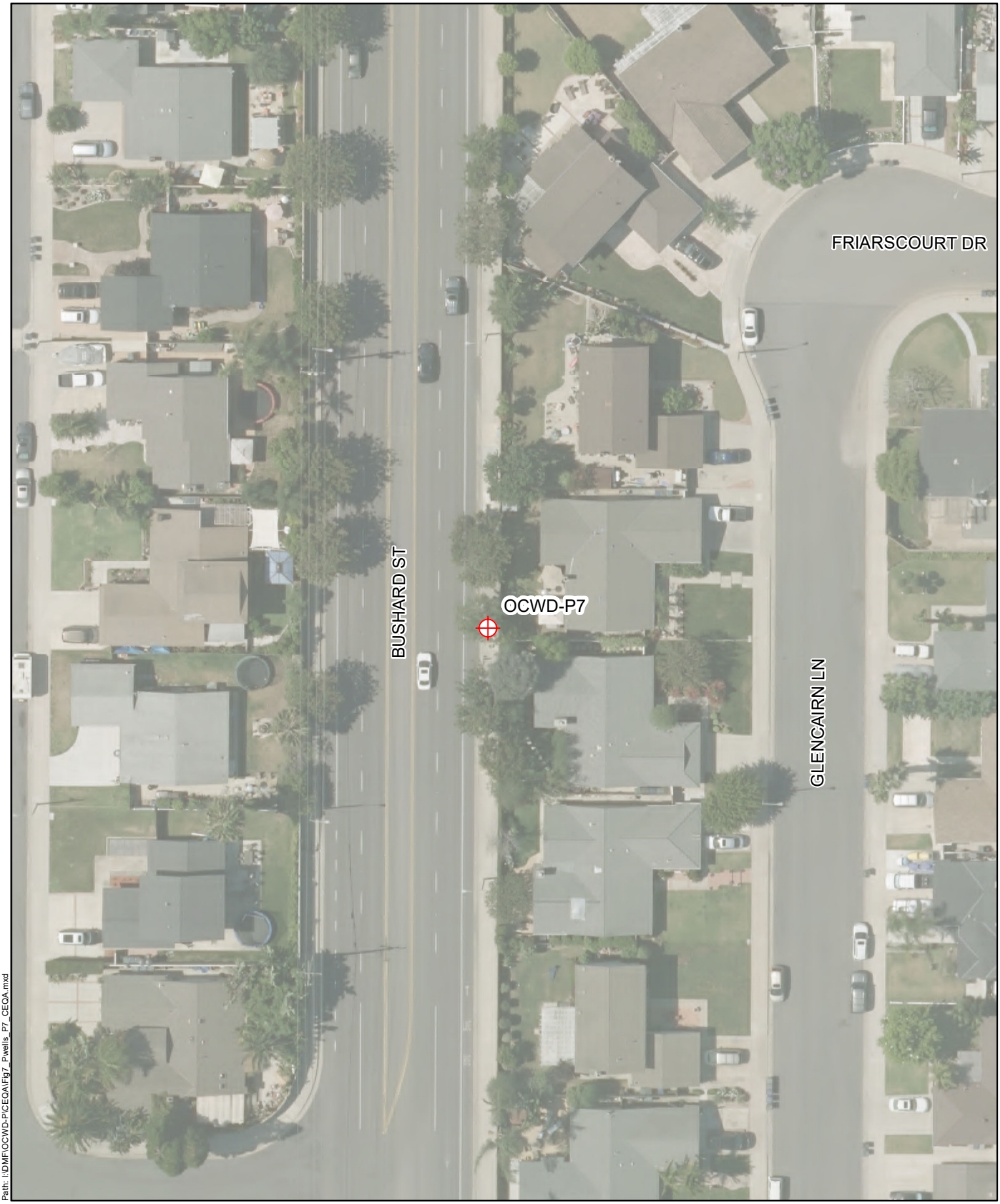
Well Location

Talbert Barrier Extraction Well Destruction Project
OCWD-P6 Well Site

Figure 6



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Well Location

Talbert Barrier Extraction Well Destruction Project
OCWD-P7 Well Site

Figure 7

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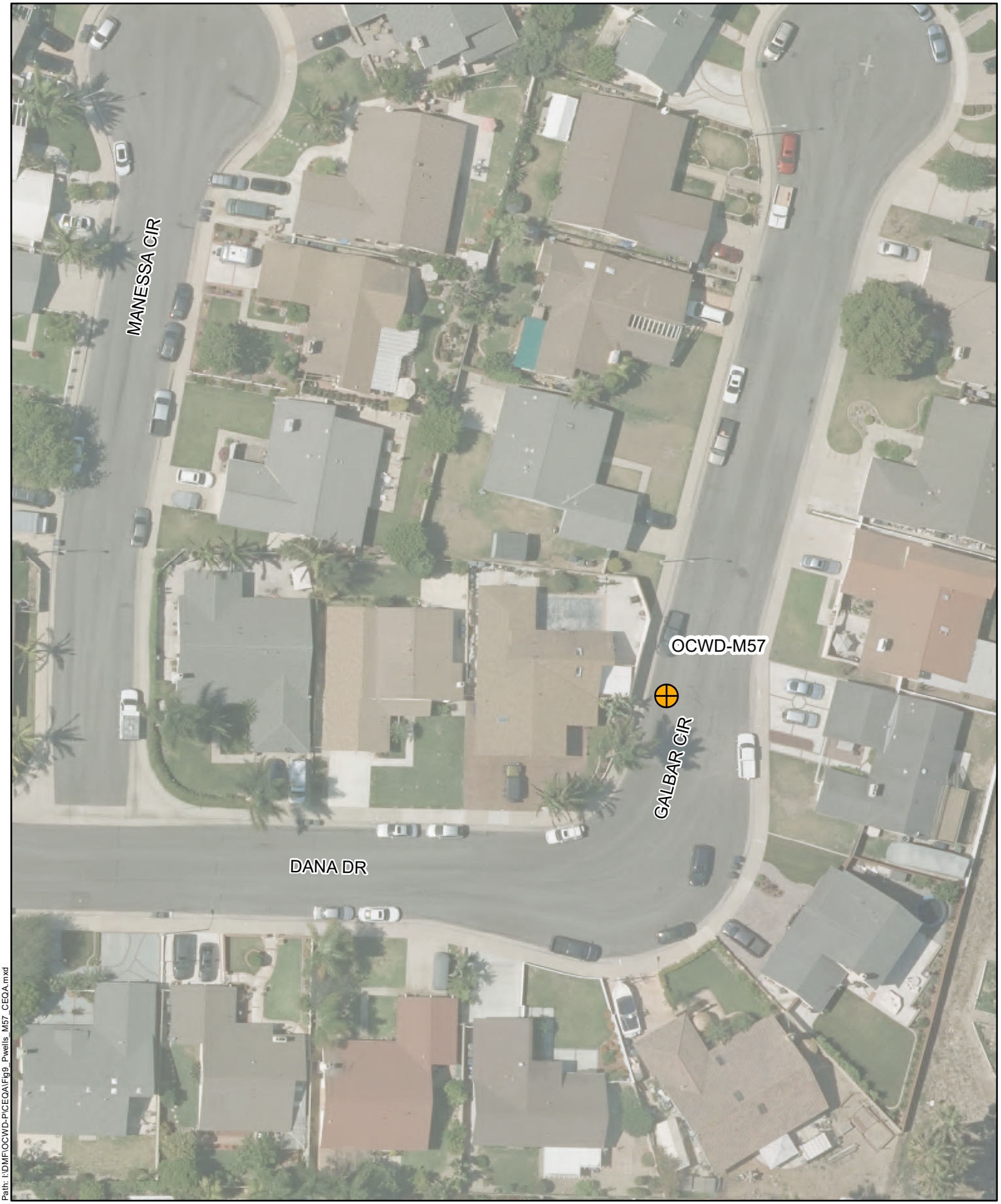
Well Location

Talbert Barrier Extraction Well Destruction Project
OCWD-P10 Well Site

Figure 8



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Feet

Talbert Barrier Extraction Well Destruction Project
Proposed OCWD-M57 Well Site

Proposed Monitoring Well Location

Figure 9

2.0 NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn with regard to the ten decibel addition to sound levels between 10 p.m. and 7 a.m., it has an additional 4.77 decibel addition to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Huntington Beach relies on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound

from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project sites are located in the City of Huntington Beach. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. The land use compatibility guidelines developed by ONC along with other parameters from the California Governor's Office of Planning and Research were used by the City of Huntington Beach to develop its own land use compatibility standards as described below under Local Regulations.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family

detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation- and Construction-Induced Vibration Guidance Manual* in 2004. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The City of Huntington Beach General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Huntington Beach General Plan

The following applicable goals, objectives, and policies to the proposed project are from the Noise Element of the General Plan.

Goal N-1 Noise-sensitive land uses are protected in areas with acceptable noise levels.

Policies:

A. Maintain acceptable stationary noise levels at existing noise-sensitive land uses such as schools, residential areas, and open spaces.

B. Incorporate design and construction features into residential, mixed-use, commercial, and industrial projects that shield noise-sensitive land uses from excessive noise.

Goal N-2 Land use patterns are compatible with current and future noise levels.

Policies:

A. Require an acoustical study for proposed projects in areas where the existing or projected noise level exceeds or would exceed the maximum allowable levels identified in Table N-2 (see Table F). The acoustical study shall be performed in accordance with the requirements set forth in this Noise Element.

B. Allow a higher exterior noise level standard for infill projects in existing residential areas adjacent to major arterials if no feasible mechanisms exist to meet exterior noise standards.

C. Minimize excessive noise from industrial land uses through incorporation of site and building design features that are intended to reduce noise impacts to sensitive land uses.

D. Encourage new mixed-use development projects to site loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noise sources away from residential portions of the development, to the extent feasible.

Goal N-4 Noise from construction activities associated with discretionary projects, maintenance vehicles, special events, and other nuisances is minimized in residential areas and near noise-sensitive land uses.

Policies:

A. Reduce construction, maintenance, and nuisance noise at the source as the first and preferred strategy to reduce noise conflicts.

B. Require that new discretionary uses and special events such as restaurants, bars, entertainment, parking facilities, and other commercial uses or beach events where large numbers of people may be present adjacent to sensitive noise receptors comply with the noise standards in Table N-2 and the City Noise Ordinance.

C. Encourage shielding for construction activities to reduce noise levels and protect adjacent noise-sensitive land uses.

D. Limit allowable hours for construction activities and maintenance operations located adjacent to noise-sensitive land uses.

Table F – City of Huntington Beach Land Use-Noise Compatibility Standards

General Plan Land Use Designation	Proposed Uses	Exterior Normally Acceptable (dBA CNEL)	Exterior Conditionally Acceptable (dBA CNEL)	Exterior Normally Unacceptable (dBA CNEL)	Interior Acceptable (dBA CNEL)
Residential					
Low Density	Single-family, mobile home, senior housing	Up to 60	61-65	≥66	45
Medium Density, Medium High Density, High Density	Attached single-family, duplex, townhomes, multi-family, condominiums, apartments	Up to 65	66-70	≥71	45
Mixed-Use					
Mixed-Use	Combination of commercial and residential uses	Up to 70	71-75	≥76	45
Commercial				≥66	
Neighborhood Commercial, General Commercial	Retail, professional office, health services, restaurant, government offices, hotel/motel	Up to 70	71-75	≥76	45
Visitor Commercial	Hotel/motel, timeshares, recreational commercial, cultural facilities	Up to 65	66-75	≥75	45
Office	Office, financial institutions	NA	NA	NA	NA
Public/Semi-public					
Semi-public (School)	Schools	Up to 60	61-65	≥66	45
Semi-public (Other)	Hospitals, churches, cultural facilities	Up to 65	66-70	≥71	45
Public	Public utilities, parking lot	NA	NA	NA	NA
Industrial					
Research and Technology	Research and development, technology, warehousing, business park	NA	NA	NA	NA
Industrial	Manufacturing, construction, transportation, business park	NA	NA	NA	NA
Open Space and Recreational					
Conservation	Environmental resource conservation	NA	NA	NA	NA
Park	Public Park	Up to 65	65-75	≥76	NA
Recreation	Golf courses, recreational water bodies	Up to 65	66-75	≥76	NA
Shore	City and state beaches	NA	NA	NA	NA

Notes:

[1] Normally acceptable means that land uses may be established in areas with the stated ambient noise level, absent any unique noise circumstances.
[2] Conditionally acceptable means that land uses should be established in areas with the stated ambient noise level only when exterior areas are omitted from the project or noise levels in exterior areas can be mitigated to the normally acceptable level. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
[3] Normally unacceptable means that land uses should generally not be established in areas with the stated ambient noise level. If the benefits of the project in addressing other General Plan goals and policies outweigh concerns about noise, the use should be established only where exterior areas are omitted from the project or where exterior areas are located and shielded from noise sources to mitigate noise to the maximum extent feasible. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
[4] Interior acceptable means that the building must be constructed so that interior noise levels do not exceed the stated maximum, regardless of the exterior noise level. Stated maximums are as determined for a typical worst-case hour during periods of use.
Source: City of Huntington Beach General Plan Table N-2.

City of Huntington Beach Municipal Code

The City of Huntington Beach Municipal Code establishes the following applicable standards related to noise.

8.40.040 Designated noise zones

The properties hereinafter described, whether within or without the City, are hereby assigned to the following noise zones:

Noise Zone 1: All residential properties;

Noise Zone 2: All professional office and public institutional properties;

Noise Zone 3: All commercial properties with the exception of professional office properties;

Noise Zone 4:All industrial properties.

8.40.050 Exterior noise standards

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

Table G – City of Huntington Beach Exterior Noise Standards

Exterior Noise Standards		
Noise Zone	**Noise Level**	**Time Period**
1	55 dB(A) 50 dB(A)	7 a.m. – 10 p.m. 10 p.m. – 7 a.m.
2	55 dB(A)	Anytime
3	60 dB(A)	Anytime
4	70 dB(A)	Anytime

Source: City of Huntington Beach, 2012.

The above standard does not apply to the establishment of multi-family residence private balconies and patios. Multi-family developments with balconies or patios that do not meet CNEL standards are required to provide occupancy disclosure notices to all future tenants.

(b) In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A).

8.40.060 Exterior noise levels prohibited

It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any residential, public institutional, professional, commercial or industrial property, either within or without the City, to exceed the applicable noise standards:

(a) For a cumulative period of more than thirty (30) minutes in any hour;

(b) Plus 5 dB(A) for cumulative period of more than fifteen (15) minutes in any hour;

(c) Plus 10 dB(A) for cumulative period of more than five (5) minutes in any hour;

(d) Plus 15 dB(A) for cumulative period of more than one (1) minute in any hour; or

(e) Plus 20 dB(A) for any period of time.

In the event the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

8.40.070 Interior noise standards

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all real property within a designated noise zone:

Table H – City of Huntington Beach Interior Noise Standards

Interior Noise Standards		
Noise Zone	**Noise Level**	**Time Period**
1	55 dB(A) 45 dB(A)	7 a.m. – 10 p.m. 10 p.m. – 7 a.m.
2,3,4	55 dB(A)	Anytime

Source: City of Huntington Beach, 2012.

(b) In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A).

8.40.080 Interior levels of noise prohibited

It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased occupied, or otherwise controlled by such person, which causes the noise level when measured within any other structure on any residential, public institutional, commercial, or industrial property to exceed:

The noise standard for a cumulative period of more than five minutes in any hour;

The noise standards plus 5 dB(A) for a cumulative period of more than one (1) minute in any hour; or

The noise standard plus 10 dB(A) for any period of time.

In the even the ambient noise level exceeds either of the first two noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the third noise level, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

Each of the noise limits specified above shall be reduced by 5 dB(A) for impact or predominant tone noises, or for noises consisting of speech or music.

In the event that the noise source and the affected property are within different noise zones, the noise standards of the affected property shall apply.

8.40.090 Special Provisions

The following activities shall be exempt from the provisions of this chapter:

(d) Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as provided herein; and provided said activities do not take place between the hours of 8 p.m. and 7 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.

(j) Any activity or equipment to the extent that design regulation thereof has been pre-empted by state or federal laws.

8.40.100 Schools, hospitals and churches – Special provisions

It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital or church while same is in use, to exceed the noise limits specified for exterior noise standards in this chapter, or which noise level unreasonably interferes with the use of such institutions or which unreasonably disturbs or annoys patients in the hospital, provided conspicuous signs are displayed in three (3) separate locations within one-tenth (1/10) of a mile of the institution indicating the presence of a school, hospital or church.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of each of the proposed extraction wells to be decommissioned as well as at the location of the proposed monitoring well to be constructed. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The unit meets the requirements of ANSI Standard S1.4-1984 and IEC Standard 942: 1988 for Class 1 equipment. All noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

Noise Measurement Location

The noise monitoring locations were selected in order to obtain noise levels in the vicinity of the nearest home to each of the proposed well sites to be decommissioned and at the proposed monitoring well site. Descriptions of the noise monitoring sites are provided below in Table I. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 11:43 a.m. 2:03 p.m. on Tuesday, May 7, 2019. When the noise measurements were started the sky was partly cloudy, the temperature was 67 degrees Fahrenheit, the humidity was 54 percent, barometric pressure was 30.04 inches of mercury, and the wind was blowing around two miles per hour. At the conclusion of the noise measurements, the sky was partly cloudy, the temperature was 67 degrees Fahrenheit, the humidity was 60 percent, barometric pressure was 30.05 inches of mercury, and the wind was blowing around seven miles per hour.

5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table I and the noise monitoring data printouts are included in Appendix B.

Table I – Noise Level Measurement Results

Site No.	Description	Primary Noise Source	Start Time of Measurement	Measured Noise Level	
				dBA Leq	dBA Lmax
1	Located northeast of OCWD-P1 in the front yard of the nearest home at 19981 Cato Circle, approximately 100 feet north of Adams Avenue.	Vehicles on Adams Avenue	11:43 a.m.	61.7	77.8
2	Located northeast of OCWD-P2 in the front yard of the nearest home at 19971 Briarly Lane, approximately 140 east of Newland Street centerline and 175 feet north of Adams Avenue centerline.	Vehicles on Adams Avenue and Newland Street	12:02 p.m.	49.8	64.8
3	Located northeast of OCWD-P3 in the front yard of the nearest home at 19961 Isthmus Lane, approximately 30 feet west of Isthmus Lane centerline and 110 feet north of Adams Avenue centerline	Vehicles on Adams Avenue	12:17 p.m.	63.1	72.1
4	Located east of OCWD-P4 in the front yard of the nearest home at 20011 Shorewood Circle, approximately 30 feet west of Shorewood Circle centerline and 100 feet south of Adams Avenue centerline	Vehicles on Adams Avenue	12:46 p.m.	63.0	72.9
5	Located west of OCWD-P6 in the front yard of the nearest home at 20512 Minervia Lane, approximately 100 feet south of Indianapolis Avenue centerline.	Vehicles on Indianapolis Avenue	1:02 p.m.	50.7	68.1
6	Located east of OCWD-P7 in the front yard of the nearest home at 20781 Glencairn Lane, approximately 30 feet west of Glencairn Lane centerline and 140 feet east of Bushard Street centerline	Vehicles on Bushard Street	1:21 p.m.	52.2	67.8
7	Located west of OCWD-P10 in the front yard of the nearest home at 10092 Spirit Circle, approximately 40 feet south of Sprit Circle centerline and 510 feet east of Brookhurst Street centerline.	Vehicles on Sprit Circle and Brookhurst Street	1:38 p.m.	60.3	76.9
8	Located on Galbar Circle roadway at proposed OCWD-M57 Monitoring Well location, approximately 15 feet west of Galbar Circle centerline and 70 feet north of Dana Drive centerline	Vehicles on Galbar Circle and Dana Drive	1:53 p.m.	50.2	69.3

Notes: Noise measurements taken with a Larson-Davis Model 831 Type 1 precision sound level meter on Tuesday, May 7, 2019.

Table I shows that the measured average noise levels currently exceed the City's residential exterior daytime (7 a.m. to 10 p.m.) noise standard of 55 dBA Leq at Wells OCWD-P1 (Site 1), OCWD-P3 (Site 3), OCWD-P4 (Site 4), and OCWD-P10 (Site 7).

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table J below provides a list of the construction equipment anticipated to be used for each phase of construction as detailed above in Section 1.4 as well as the nearest match to each piece of construction equipment provided in the RCNM model, the acoustical use factor and the measured noise level that is utilized in the RCNM Model.

Table J – Construction Equipment Noise Emissions and Usage Factors from RCNM Model

Equipment Description	Number of Equipment	Equivalent Equipment in RCNM	Acoustical Use Factor[1] (percent)	Actual Measured Lmax at 50 feet[3] (dBA, slow[2])
Phase 1 - Extraction Well Destruction				
Pump Rig	1	Pumps	50	80.9
Support Truck	1	Flat Bed Truck	40	74.3
Cement Truck	1	Concrete Mixer Truck	40	78.8
Cement Pumper	1	Concrete Pump Truck	20	81.4
Air Compressor	1	Compressor (air)	40	77.7
Pick-up Truck	1	Pickup Truck	40	75.0
Phase 2 – Removal of Below-Ground Concrete Well Vaults				
Backhoe	1	Backhoe	40	77.6
Material Truck	1	Flat Bed Truck	40	74.3
Water Truck	1	Flat Bed Truck	40	74.3
Pick-up Truck	3	Pickup Truck	40	75.0
Phase 3 – Abandonment of the Water Supply Pipeline				
Backhoe	1	Backhoe	40	77.6
Material Truck	1	Flat Bed Truck	40	74.3
Asphalt Roller	1	Roller	20	80.0
Cement Truck	1	Concrete Mixer Truck	40	78.8
Cement Pumper	1	Concrete Pump Truck	20	81.4
Pick-up Truck	3	Pickup Truck	40	75.0
Phase 4 – Monitoring Well Construction				
Air-Vac Truck	1	Vacuum Excavator	40	85.3
Drilling Rig	1	Drill Rig Truck	20	79.1
Mud Circulation System	1	Slurry Plant	100	78.0
Support Truck	1	Flat Bed Truck	40	74.3
Forklift	1	Gradall	40	83.4
Pump Rig	1	Pumps	50	80.9
Air Compressor	1	Compressor (air)	40	77.7
Electrical Generator	1	Generator (<25KVA, VMS)	50	72.8
Pick-up Truck	2	Pickup Truck	40	75.0

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.

[2] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[3] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

6.2 Operations-Related Noise

In general, operation of the monitoring well would be passive as there would be no permanent equipment installed in the well. Monitoring well operation involves periodically measuring the depth to groundwater and collecting groundwater samples for laboratory analysis. The depth to groundwater would be measured by hand using a battery-powered wire-line sounder. During a groundwater sampling event, a portable submersible pump would be lowered in each of the well casings. Operation of a submersible pump to lift water from the well would require the use of a small portable generator. OCWD staff would collect groundwater samples and record water levels on a quarterly basis or less. In total, the monitoring well would be visited by OCWD staff up to eight times a year. Every three to five years OCWD would conduct maintenance activities to redevelop the well. A typical monitoring well redevelopment process would be completed in one day. All sampling and redevelopment activities would occur during daylight hours. The anticipated timing and construction equipment utilized during well sampling and rehabilitation have been discussed above in Section 1.6.

Table K below provides a list of the equipment anticipated to be used during monitoring well operational activities of well sampling and well rehabilitation activities as detailed above in Section 1.6 as well as the nearest match to each piece of equipment provided in the RCNM model, the acoustical use factor and the measured noise level that is utilized in the RCNM Model.

Table K – Operational Equipment Noise Emissions and Usage Factors from RCNM Model

Equipment Description	Number of Equipment	Equivalent Equipment in RCNM	Acoustical Use Factor[1] (percent)	Actual Measured Lmax at 50 feet[3] (dBA, slow[2])
Well Sampling				
Electrical Generator	1	Generator (<25KVA, VMS)	50	72.8
Well Redevelopment				
Pump Rig	1	Pumps	50	80.9
Air Compressor	1	Compressor (air)	40	77.7
Pick-up Truck	1	Pickup Truck	40	75.0

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[3] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

6.3 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table L gives approximate vibration levels for particular construction activities. The data in Table L provides a reasonable estimate for a wide range of soil conditions.

Table L – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, May 2006.

The construction-related vibration impacts have been calculated through the vibration levels shown above in Table L and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table J.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

The proposed project involves the destruction and permanent decommissioning of seven (7) extraction wells including demolition of the associated structures and pipeline and construction and operation of one (1) new monitoring well. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. All destruction and construction operations would occur between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday or as otherwise specified in the City Encroachment Permits.

Section 8.40.090(d) of the City of Huntington Beach Municipal Code exempts construction noise from the City noise standards that occurs between the hours of 7:00 a.m. and 8:00 p.m., on any day except Sunday or a federal holiday. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents.

In order to determine if the proposed construction activities would create a significant substantial temporary noise increase, the OSHA agency limits for noise exposure to workers have been utilized. The use of a significance threshold using an OSHA standard is considered conservative. The OSHA standard limits noise exposure of workers to 90 dB or less over eight continuous hours and this standard has been utilized to analyze the construction noise impacts to the nearby sensitive receptors.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table J – Construction Equipment Noise Emissions and Usage Factors. The project applicant has segmented the proposed project into four phases of construction, which have been analyzed separately below. In addition, since the operational noise impacts would be limited to construction equipment noise sources

associated with well sampling and redevelopment activities, which are essentially construction projects, the construction noise standards described above have been utilized for operational activities as well and have also been analyzed below.

Phases 1 and 2 Decommissioning of the Extraction Wells

Phase 1 of the proposed project involves properly destroying the extraction wells via perforating the blank well casings and sealing the wells with cement grout. Phase 2 involves filling and removal of the below-ground concrete well vaults. Well destruction work would take approximately one week per well for well sealing and approximately one week per well of vault demolition and concrete and asphalt repair. The calculated Phase 1 and Phase 2 construction noise level results are shown below in Table M and the RCNM printouts are provided in Appendix C.

Table M – Phases 1 & 2 Well Decommissioning Noise Levels at the Nearest Sensitive Receptors

Extraction Well	Distance to Nearest Receptor[1] (feet)	Existing Wall Height[2] (feet)	Construction Noise Levels at Nearest Receptor	
			Phase 1 (dBA Leq)	Phase 2 (dBA Leq)
OCWD-P1	15	7	86	83
OCWD-P2	65	7	73	70
OCWD-P3	60	7	74	71
OCWD-P4	110	0	75	72
OCWD-P6	30	0	87	84
OCWD-P7	20	7	84	81
OCWD-P10	270	6	62	59
	Construction Noise Threshold (OSHA)		**90**	**90**
	Exceed Thresholds?		**No**	**No**

[1] Distance from Extraction Well to nearest residential or commercial structure.

[2] According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (Caltrans, 2013), a sound wall provides approximately 0.9 dB of attenuation for each foot of wall height (i.e., a 7-foot high wall will provide 6.3 dB of attenuation), which was utilized to enter the estimated shielding into the RCNM model.

Source: RCNM, Federal Highway Administration, 2006 (see Appendix C)

Table M shows that the greatest noise impacts during Phases 1 and 2 would occur at the nearest homes to Extraction Well OCWD-P6, with a noise level as high as 87 dBA Leq, which is within the OSHA noise standard of 90 dB to protect workers from health impacts created from high noise levels. Therefore, through adherence to the limitation of allowable construction times provided in Section 8.40.090 of the Municipal Code, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from Phase 1 and Phase 2 construction activities for the proposed project. Impacts would be less than significant.

Phase 3 Abandonment of Water Supply Pipelines

Phase 3 of the proposed project involves abandonment of the water supply pipeline. The proposed pipeline abandonment would occur in three steps; 1) excavate and cap the pipeline at ten locations, 2) fill 24-inch pipeline with sand-cement slurry, and 3) repair the asphalt at pipeline cap locations. The estimated schedule includes 13 days for pipeline abandonment. The calculated Phase 3 construction noise level results are shown below in Table M and the RCNM printouts are provided in Appendix D.

Table N – Phase 3 Pipeline Abandonment Noise Levels at the Nearest Sensitive Receptors

Pipeline Abandonment Location	Distance to Nearest Receptor[1] (feet)	Existing Wall Height[2] (feet)	Phase 3 Construction Noise Levels at Nearest Receptor (dBA Leq)
Adams Avenue	20	7	83
Atlanta Avenue	20	7	83
Bushard Street	40	7	77
		Construction Noise Threshold (OSHA)	**90**
		Exceed Thresholds?	**No**

[1] Distance from water line manholes to nearest residential or commercial structure.
[2] According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (Caltrans, 2013), a sound wall provides approximately 0.9 dB of attenuation for each foot of wall height (i.e., a 7-foot high wall will provide 6.3 dB of attenuation), which was utilized to enter the estimated shielding into the RCNM model.
Source: RCNM, Federal Highway Administration, 2006 (see Appendix D)

Table M shows that the greatest noise impacts during Phase 3 abandonment of the water supply pipelines would occur at the nearest homes to the pipelines located in Adams Avenue and Atlanta Avenue, with a noise level as high as 83 dBA Leq, which is within the OSHA noise standard of 90 dB to protect workers from health impacts created from high noise levels. Therefore, through adherence to the limitation of allowable construction times provided in Section 8.40.090 of the Municipal Code, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from Phase 3 pipeline abandonment activities. Impacts would be less than significant.

Phase 4 Monitoring Well OCWD-M57 Construction

Phase 4 involves construction of Monitoring Well OCWD-M57. The proposed monitoring well construction would occur in three steps; 1) mobilization, borehole drilling, and well construction, 2) well development, and 3) demobilization, site clean-up, and vault installation. Step 3 involves minimal equipment and would be done by hand. The estimated schedule includes 5 days for the monitoring well construction. The calculated Phase 4 construction noise level results are shown below in Table O and the RCNM printouts are provided in Appendix E.

Table O – Phase 4 Monitoring Well Construction Noise Levels at the Nearby Homes

Receptor	Distance to Nearest Receptor[1] (feet)	Existing Wall Height[2] (feet)	Phase 4 Construction Noise Levels at Receptor (dBA Leq)
Nearest Home to West	20	8	87
Nearest Home to East	65	0	84
		Construction Noise Threshold (OSHA)	**90**
		Exceed Thresholds?	**No**

[1] Distance from proposed monitoring well OCWD-M57 location to residential structure.
[2] According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (Caltrans, 2013), a sound wall provides approximately 0.9 dB of attenuation for each foot of wall height (i.e., an 8-foot high wall will provide 7.2 dB of attenuation), which was utilized to enter the estimated shielding into the RCNM model.
Source: RCNM, Federal Highway Administration, 2006 (see Appendix E)

Table O shows that the greatest noise impacts during Phase 4 construction of Monitoring Well OCWD-M57 would occur at the nearest home located to the west of the proposed monitoring well location, with a noise level as high as 87 dBA Leq, which is within the OSHA noise standard of 90 dB to protect workers

from health impacts created from high noise levels. Therefore, through adherence to the limitation of allowable construction times provided in Section 8.40.090 of the Municipal Code, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from Phase 4 Monitor Well OCWD-M57 well construction activities. Impacts would be less than significant.

Monitoring Well OCWD-M57 Operational Noise Impacts

In general, operation of the monitoring well would be passive as there would be no permanent equipment installed in the well. Monitoring well operation involves periodically measuring the depth to groundwater and collecting groundwater samples for laboratory analysis. The depth to groundwater would be measured by hand using a battery-powered wire-line sounder. During a groundwater sampling event, a portable submersible pump would be lowered in each of the well casings. Operation of a submersible pump to lift water from the well would require the use of a small portable generator. OCWD staff would collect groundwater samples and record water levels on a quarterly basis or less. In total, the monitoring well would be visited by OCWD staff up to eight times a year. Every three to five years OCWD would conduct maintenance activities to redevelop the well. A typical monitoring well redevelopment process would be completed in one day. All sampling and redevelopment activities would occur during daylight hours. The noise impacts created from the monitoring well sampling and redevelopment activities have been calculated and the noise level results are shown below in Table P and the RCNM printouts are provided in Appendix F.

Table P – Monitoring Well Operational Noise Levels at the Nearby Homes

Receptor	Distance to Nearest Receptor[1] (feet)	Existing Wall Height[2] (feet)	Noise Levels at Nearby Home (dBA Leq)	
			Sampling	Well Redevelopment
Nearest Home to West	20	8	71	81
Nearest Home to East	65	0	68	78
		Construction Noise Threshold (OSHA)	**90**	**90**
		Exceed Thresholds?	**No**	**No**

[1] Distance from proposed monitoring well OCWD-M57 location to residential structure.
[2] According to the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (Caltrans, 2013), a sound wall provides approximately 0.9 dB of attenuation for each foot of wall height (i.e., an 8-foot high wall will provide 7.2 dB of attenuation), which was utilized to enter the estimated shielding into the RCNM model.
Source: RCNM, Federal Highway Administration, 2006 (see Appendix F)

Table P shows that the greatest operational noise impact would occur at the nearest home to the west during monitor well redevelopment activities with a noise level as high as 81 dBA Leq, which is within the OSHA noise standard of 90 dB to protect workers from health impacts created from high noise levels. Therefore, through adherence to the limitation of allowable construction times provided in Section 8.40.090 of the Municipal Code, operation-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would operational activities create a substantial temporary increase in ambient noise levels from Monitor Well OCWD-M57 well sampling and well redevelopment activities. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. Vibration impacts from construction and operational activities associated with the proposed project would be a function of the vibration generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The construction activities for the proposed project involves the destruction and permanent decommissioning of seven (7) extraction wells including demolition of the associated structures and pipeline and construction of one (1) new monitoring well. In addition, operational activities associated with well redevelopment would also utilize construction equipment.

Since Neither the City's Municipal Code nor the General Plan provide a quantifiable vibration threshold, Caltrans guidance that is detailed above in Section 4.2 has been utilized, which defines the threshold of perception from transient sources at 0.25 inch per second PPV.

Table L above in Section 6.3 provides a list of construction equipment that are known sources of vibration. Of the equipment listed in Table L above, the caisson drill, which is similar to a drill rig is the only piece of equipment that would be utilized during either construction or operation of the proposed project that is a known source of vibration. The drill rig would be utilized during Phase 4, monitor well construction activities and according to Table L above, a caisson drill creates a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest home to the monitoring well construction activities (20 feet away) would be 0.11 inch per second PPV. The vibration level at the nearest offsite receptor would be below the 0.25 inch per second PPV threshold detailed above. Therefore, a less than significant vibration impact is anticipated from construction and operation of the proposed project.

Level of Significance

Less than significant impact.

7.4 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The proposed project involves the destruction and permanent decommissioning of seven (7) extraction wells including demolition of the associated structures and pipeline and construction and operation of one (1) new monitoring well. The operational activities associated with the proposed monitoring well will typically be passive and would not require anyone onsite and would not introduce any new sensitive receptors to the project site. No aircraft noise impacts would occur.

Level of Significance

No impact.

8.0 REFERENCES

California Department of Transportation, *2016 Annual Average Daily Truck Traffic on the California State Highway System*, 2018.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction-Induced Vibration Guidance Manual*, September 2013.

City of Huntington Beach, *City of Huntington Beach General Plan*, October 2017.

City of Huntington Beach, *Chapter 8.40 Noise Control,* 2012.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006.

Integrated Engineering Group, *Vernola Family Park Traffic Impact Analysis,* January 2019.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

Vista Environmental, *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Horseshoe Lake Park Master Plan Project,* April 25, 2019.

APPENDIX A

Field Noise Measurements Photo Index

Noise Measurement Site 1 - looking north

Noise Measurement Site 1 - looking northeast

Noise Measurement Site 1 - looking east

Noise Measurement Site 1 - looking southeast

Noise Measurement Site 1 - looking south

Noise Measurement Site 1 - looking southwest

Noise Measurement Site 1 - looking west

Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

Noise Measurement Site 2 - looking northeast

Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast

Noise Measurement Site 2 - looking south

Noise Measurement Site 2 - looking southwest

Noise Measurement Site 2 - looking west

Noise Measurement Site 2 - looking northwest

Noise Measurement Site 3 - looking north

Noise Measurement Site 3 - looking northeast

Noise Measurement Site 3 - looking east

Noise Measurement Site 3 - looking southeast

Noise Measurement Site 3 - looking south

Noise Measurement Site 3 - looking southwest

Noise Measurement Site 3 - looking west

Noise Measurement Site 3 - looking northwest

Noise Measurement Site 4 - looking north

Noise Measurement Site 4 - looking northeast

Noise Measurement Site 4 - looking east

Noise Measurement Site 4 - looking southeast

Noise Measurement Site 4 - looking south

Noise Measurement Site 4 - looking southwest

Noise Measurement Site 4 - looking west

Noise Measurement Site 4 - looking northwest

Noise Measurement Site 5 - looking north

Noise Measurement Site 5 - looking northeast

Noise Measurement Site 5 - looking east

Noise Measurement Site 5 - looking southeast

Noise Measurement Site 5 - looking south

Noise Measurement Site 5 - looking southwest

Noise Measurement Site 5 - looking west

Noise Measurement Site 5 - looking northwest

Noise Measurement Site 6 - looking north

Noise Measurement Site 6 - looking northeast

Noise Measurement Site 6 - looking east

Noise Measurement Site 6 - looking southeast

Noise Measurement Site 6 - looking south

Noise Measurement Site 6 - looking southwest

Noise Measurement Site 6 - looking west

Noise Measurement Site 6 - looking northwest

Noise Measurement Site 7 - looking north

Noise Measurement Site 7 - looking northeast

Noise Measurement Site 7 - looking east

Noise Measurement Site 7 - looking southeast

Noise Measurement Site 7 - looking south

Noise Measurement Site 7 - looking southwest

Noise Measurement Site 7 - looking west

Noise Measurement Site 7 - looking northwest

Noise Measurement Site 8 - looking north

Noise Measurement Site 8 - looking northeast

Noise Measurement Site 8 - looking east

Noise Measurement Site 8 - looking southeast

Noise Measurement Site 8 - looking south

Noise Measurement Site 8 - looking southwest

Noise Measurement Site 8 - looking west

Noise Measurement Site 8 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.001
User	GT
Job Description	Talbert Extraction Well Destruction
Location	NE of OCWD-P1 - Front Yard of 19981 Cato Circle
Measurement Description	
Start Time	Tuesday, 2019 May 07 11:43:26
Stop Time	Tuesday, 2019 May 07 11:53:26
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 11:41:51
Post Calibration	None
Calibration Deviation	---

Note

Noise from Adams Ave, approx 100 ft north of Adams Ave CL and behind 7 foot wall
67 F, 30.04 in Hg, 54% Hu, 2mph wind partly cloudy

Overall Data

LAeq		61.7	dB
LASmax	2019 May 07 11:50:17	77.8	dB
LApeak (max)	2019 May 07 11:49:34	95.5	dB
LASmin	2019 May 07 11:51:46	41.9	dB
LCeq		68.3	dB
LAeq		61.7	dB
LCeq - LAeq		6.6	dB
LAIeq		69.5	dB
LAeq		61.7	dB
LAIeq - LAeq		7.8	dB
Ldn		61.7	dB
LDay 07:00-22:00		61.7	dB
LNight 22:00-07:00		---	dB
Lden		61.7	dB
LDay 07:00-19:00		61.7	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		89.5	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	66.0	dBA
LAS10.00	63.7	dBA
LAS33.30	58.5	dBA
LAS50.00	56.8	dBA
LAS66.60	54.0	dBA
LAS90.00	48.3	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	17 / 53.9	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	16.9	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	63.6	59.8	63.4	63.3	61.3	55.2	61.5	57.3	48.9	40.7	34.3	22.7
LZSmax	83.2	75.0	71.2	75.4	77.1	64.9	78.7	74.4	62.6	50.8	44.5	34.1
LZSmin	44.6	48.6	52.6	51.4	45.8	40.4	38.8	35.4	31.7	29.5	21.7	15.5

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	60.9	57.8	56.5	55.1	55.2	55.0	54.6	60.9	58.0	58.2	59.9	57.1
LZSmax	79.8	75.2	77.6	72.7	69.8	72.0	66.0	69.9	70.6	69.3	74.3	71.2
LZSmin	36.2	37.6	39.7	40.6	41.4	43.5	46.0	45.7	47.2	45.4	44.7	43.6

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	56.6	57.9	54.4	51.7	50.3	48.8	49.1	58.1	58.5	54.1	53.3	48.4
LZSmax	71.6	76.9	68.4	61.1	59.6	62.1	65.1	76.0	75.8	71.5	71.9	63.9
LZSmin	42.3	38.4	37.5	36.8	35.0	34.1	34.7	34.1	31.8	30.9	30.4	29.7

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	47.0	42.5	40.1	37.7	35.6	33.1	32.1	29.0	24.9	20.7	16.7	12.2
LZSmax	61.6	56.6	51.5	47.9	46.9	42.6	42.0	40.2	36.2	33.2	26.6	29.3
LZSmin	28.0	25.9	25.8	26.1	24.3	22.7	19.1	16.0	13.3	10.3	11.6	8.9

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.002
User	GT
Job Description	Talbert Extraction Well Destruction
Location	NE of OCWD-P2 - Front Yard of 19971 Briarly Lane
Measurement Description	
Start Time	Tuesday, 2019 May 07 12:02:21
Stop Time	Tuesday, 2019 May 07 12:12:21
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 11:41:50
Post Calibration	None
Calibration Deviation	---

Note

Approx 140 ft east of Newland St CL and 175 ft north of Adams St CL behind 7 foot wall
67 F, 30.04 in Hg, 54% Hu, 2 mph wind, partly cloudy

Overall Data

LAeq		49.8	dB
LASmax	2019 May 07 12:06:53	64.8	dB
LApeak (max)	2019 May 07 12:06:53	89.1	dB
LASmin	2019 May 07 12:05:39	40.6	dB
LCeq		64.5	dB
LAeq		49.8	dB
LCeq - LAeq		14.7	dB
LAIeq		54.6	dB
LAeq		49.8	dB
LAIeq - LAeq		4.8	dB
Ldn		49.8	dB
LDay 07:00-22:00		49.8	dB
LNight 22:00-07:00		---	dB
Lden		49.8	dB
LDay 07:00-19:00		49.8	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		77.6	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	54.9	dBA
LAS10.00	52.5	dBA
LAS33.30	49.0	dBA
LAS50.00	47.7	dBA
LAS66.60	46.7	dBA
LAS90.00	44.1	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	16.9	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	65.6	61.4	62.5	61.7	54.5	49.2	47.1	45.5	39.1	34.6	24.7	15.4
LZSmax	84.0	75.8	71.3	76.1	69.0	60.2	59.0	60.1	58.0	56.1	45.3	31.5
LZSmin	40.0	51.0	54.9	50.6	43.8	39.0	37.3	34.0	27.6	19.2	14.0	13.4

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	62.8	60.5	57.7	57.3	56.7	56.2	58.2	58.0	56.7	56.5	58.3	55.7
LZSmax	79.1	80.6	71.8	74.8	70.4	67.6	67.6	69.0	68.5	69.4	74.8	69.5
LZSmin	39.3	38.5	40.9	42.6	45.1	46.5	49.1	48.0	36.2	46.1	39.8	43.3

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	50.1	50.6	48.1	45.2	44.7	43.4	42.4	42.4	42.1	42.0	40.9	38.9
LZSmax	62.9	65.3	66.3	59.5	55.7	55.3	54.6	53.6	54.7	57.3	55.7	54.0
LZSmin	40.5	38.5	34.8	34.0	32.8	26.0	29.7	31.0	30.2	29.8	29.5	27.8

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	36.1	33.7	32.5	31.4	30.5	26.1	22.2	19.3	16.0	11.1	11.3	9.3
LZSmax	51.5	52.9	55.0	53.3	52.2	46.0	43.2	40.5	37.7	30.5	26.1	20.3
LZSmin	24.5	22.1	18.2	15.8	14.2	12.2	10.6	8.4	7.4	7.2	9.6	8.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.003
User	GT
Job Description	Talbert Extraction Well Destruction
Location	NE of OCWD-P3 - Front Yard of 19961 Isthmus Lane
Measurement Description	
Start Time	Tuesday, 2019 May 07 12:17:10
Stop Time	Tuesday, 2019 May 07 12:27:10
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 11:41:50
Post Calibration	None
Calibration Deviation	---

Note

Approx 30 ft west of Isthmus Ln CL and 110 ft north of Adams Ave CL
67 F, 30.04 in Hg, 54% Hu, 2 mph wind, partly cloudy

Overall Data

LAeq		63.1	dB
LASmax	2019 May 07 12:20:20	72.1	dB
LApeak (max)	2019 May 07 12:22:36	87.5	dB
LASmin	2019 May 07 12:23:12	44.0	dB
LCeq		70.9	dB
LAeq		63.1	dB
LCeq - LAeq		7.7	dB
LAIeq		64.1	dB
LAeq		63.1	dB
LAIeq - LAeq		0.9	dB
Ldn		63.1	dB
LDay 07:00-22:00		63.1	dB
LNight 22:00-07:00		---	dB
Lden		63.1	dB
LDay 07:00-19:00		63.1	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		90.9	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	68.3	dBA
LAS10.00	67.6	dBA
LAS33.30	62.7	dBA
LAS50.00	60.1	dBA
LAS66.60	57.2	dBA
LAS90.00	51.8	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	8 / 180.8	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.6	dB
Noise Floor	16.9	dB
Overload	143.1	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	65.9	61.8	62.8	65.8	66.6	60.9	59.0	60.3	53.3	44.5	35.2	23.0
LZSmax	81.2	75.5	72.7	80.4	83.6	75.4	70.1	69.0	61.9	55.4	49.8	36.5
LZSmin	49.7	46.5	53.7	53.5	49.1	42.0	38.7	36.4	31.9	24.0	15.6	13.4

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	62.7	60.5	59.6	57.6	56.9	56.5	56.8	57.4	59.5	60.0	61.6	61.3
LZSmax	78.2	76.4	71.7	69.4	70.0	73.3	68.4	67.1	71.9	74.8	78.6	80.3
LZSmin	35.6	39.1	51.2	44.5	45.4	47.0	40.5	47.7	49.2	48.3	46.5	45.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	61.9	63.0	60.0	57.5	56.4	53.9	52.9	53.8	55.6	56.3	56.0	54.1
LZSmax	81.3	81.1	80.1	73.9	71.5	66.8	63.6	64.4	68.6	66.3	64.4	62.0
LZSmin	45.0	42.8	41.6	39.3	36.4	34.9	33.2	33.6	32.5	32.0	32.0	31.0

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	51.2	47.3	44.6	42.0	39.3	35.7	32.8	30.0	25.3	20.8	17.4	12.4
LZSmax	59.6	56.2	55.0	52.7	50.5	48.3	47.1	45.4	41.2	35.0	35.9	28.1
LZSmin	28.6	25.1	25.2	21.5	18.5	15.0	12.5	10.1	8.7	7.7	9.2	8.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.004
User	GT
Job Description	Talbert Extraction Well Destruction
Location	East of OCWD-P4 - Front Yard of 20011 Shorewood Circle
Measurement Description	
Start Time	Tuesday, 2019 May 07 12:46:37
Stop Time	Tuesday, 2019 May 07 12:56:37
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 12:46:10
Post Calibration	None
Calibration Deviation	---

Note

Approx 30 ft west of Shorewood Cir CL and 100 ft south of Adams Ave CL
67 F, 30.04 in Hg, 54% Hu, 2 mph wind, partly cloudy

Overall Data

LAeq		63.0	dB
LASmax	2019 May 07 12:53:07	72.9	dB
LApeak (max)	2019 May 07 12:51:25	88.3	dB
LASmin	2019 May 07 12:55:42	45.4	dB
LCeq		71.5	dB
LAeq		63.0	dB
LCeq - LAeq		8.5	dB
LAIeq		64.1	dB
LAeq		63.0	dB
LAIeq - LAeq		1.0	dB
Ldn		63.0	dB
LDay 07:00-22:00		63.0	dB
LNight 22:00-07:00		---	dB
Lden		63.0	dB
LDay 07:00-19:00		63.0	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		90.8	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	68.3	dBA
LAS10.00	66.8	dBA
LAS33.30	63.1	dBA
LAS50.00	60.7	dBA
LAS66.60	57.9	dBA
LAS90.00	52.1	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	23 / 163.9	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	25.8	dB
Under Range Peak	74.7	dB
Noise Floor	16.6	dB
Overload	142.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	60.8	61.9	64.5	69.6	63.0	60.0	58.4	60.3	54.2	46.6	36.5	23.4
LZSmax	81.7	75.4	77.5	89.5	78.3	74.7	70.6	69.5	62.7	64.1	52.3	36.1
LZSmin	51.3	52.3	56.0	54.3	49.1	42.3	42.0	40.3	36.0	26.4	17.1	12.2

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	56.2	55.7	56.5	55.6	57.7	57.8	58.3	59.3	61.1	64.4	67.2	60.9
LZSmax	77.5	78.3	73.1	72.1	72.2	73.6	72.2	74.7	74.3	87.1	86.5	76.2
LZSmin	36.7	38.1	48.9	44.7	48.1	45.9	49.5	48.0	48.5	49.2	48.3	45.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	58.1	59.8	55.7	55.7	55.9	53.7	52.7	53.5	54.5	55.9	56.1	54.6
LZSmax	70.4	77.5	68.8	72.0	72.8	68.4	67.4	66.6	65.1	66.5	64.9	62.3
LZSmin	45.1	44.1	39.6	37.8	38.0	35.6	35.7	35.4	36.0	35.3	35.8	35.0

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	51.8	48.5	45.8	43.8	42.3	36.7	34.4	30.9	26.5	21.6	17.2	12.0
LZSmax	60.1	57.5	55.9	59.0	62.3	52.0	50.7	46.7	40.2	34.5	30.7	23.7
LZSmin	33.9	30.4	26.5	23.9	20.5	18.1	14.5	11.5	8.9	7.3	7.4	7.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 12:46:08	-24.7
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.005
User	GT
Job Description	Talbert Extraction Well Destruction
Location	West of OCWD-P6 - Front Yard of 20512 Minervia Lane
Measurement Description	
Start Time	Tuesday, 2019 May 07 13:02:34
Stop Time	Tuesday, 2019 May 07 13:12:34
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 12:46:08
Post Calibration	None
Calibration Deviation	---

Note

Approx 40 ft east of Minerva Ln CL and 100 ft south of Indianapolis Ave CL
67 F, 30.05 in Hg, 56% Hu, 5 mph wind, partly cloudy

Overall Data

LAeq		50.7	dB
LASmax	2019 May 07 13:02:53	68.1	dB
LApeak (max)	2019 May 07 13:02:52	81.9	dB
LASmin	2019 May 07 13:06:35	38.5	dB
LCeq		63.1	dB
LAeq		50.7	dB
LCeq - LAeq		12.4	dB
LAIeq		52.2	dB
LAeq		50.7	dB
LAIeq - LAeq		1.5	dB
Ldn		50.7	dB
LDay 07:00-22:00		50.7	dB
LNight 22:00-07:00		---	dB
Lden		50.7	dB
LDay 07:00-19:00		50.7	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		78.5	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	54.3	dBA
LAS10.00	52.4	dBA
LAS33.30	47.6	dBA
LAS50.00	45.3	dBA
LAS66.60	42.7	dBA
LAS90.00	40.6	dBA

LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 4.7	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	25.8	dB
Under Range Peak	74.7	dB
Noise Floor	16.6	dB
Overload	142.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	65.9	59.6	61.0	58.8	55.6	48.9	46.5	46.2	42.6	37.4	33.4	17.5
LZSmax	85.4	71.9	80.8	75.6	72.2	62.1	62.7	63.6	62.2	57.8	57.0	37.4
LZSmin	47.1	50.2	49.5	48.2	43.5	36.0	33.6	33.8	28.2	20.0	12.9	11.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	63.5	60.5	58.4	56.1	54.6	53.4	52.9	51.4	59.5	53.0	54.6	54.0
LZSmax	83.4	77.0	74.1	69.3	67.4	65.1	67.4	64.7	80.7	69.9	75.1	69.0
LZSmin	38.1	38.5	43.5	42.9	43.9	45.2	44.6	43.9	43.4	42.2	42.6	42.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	50.5	52.7	48.0	44.8	44.7	42.3	42.0	42.3	40.9	41.3	41.8	41.4
LZSmax	63.0	71.2	66.3	56.0	58.9	57.3	57.0	60.3	55.4	57.5	59.5	59.2
LZSmin	39.8	37.1	34.5	30.4	31.0	29.8	26.9	27.9	29.5	29.1	28.9	27.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	38.3	37.8	37.2	34.7	32.6	28.9	26.0	32.1	23.4	15.4	11.6	8.7
LZSmax	56.6	57.6	57.6	54.8	53.4	49.0	46.5	56.8	46.8	35.9	30.7	22.9
LZSmin	25.5	22.4	19.9	17.1	14.8	11.6	9.3	7.6	6.4	6.5	7.0	7.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 12:46:08	-24.7
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.006
User	GT
Job Description	Talbert Extraction Well Destruction
Location	East of OCWD-P7 - Front Yard of 20781 Glencairn Lane
Measurement Description	
Start Time	Tuesday, 2019 May 07 13:21:43
Stop Time	Tuesday, 2019 May 07 13:31:43
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 12:46:08
Post Calibration	None
Calibration Deviation	---

Note

Approx 30 ft west of Glencairn Ln CL and 140 ft east of Bushard St CL
67 F, 30.05 in Hg, 56% Hu, 5 mph wind, partly cloudy

Overall Data

LAeq		52.2	dB
LASmax	2019 May 07 13:24:26	67.8	dB
LApeak (max)	2019 May 07 13:24:26	91.8	dB
LASmin	2019 May 07 13:22:20	40.5	dB
LCeq		62.9	dB
LAeq		52.2	dB
LCeq - LAeq		10.6	dB
LAIeq		58.7	dB
LAeq		52.2	dB
LAIeq - LAeq		6.4	dB
Ldn		52.2	dB
LDay 07:00-22:00		52.2	dB
LNight 22:00-07:00		---	dB
Lden		52.2	dB
LDay 07:00-19:00		52.2	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		80.0	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	58.2	dBA
LAS10.00	56.1	dBA
LAS33.30	50.2	dBA
LAS50.00	48.3	dBA
LAS66.60	46.1	dBA
LAS90.00	43.1	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 1.7	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	25.8	dB
Under Range Peak	74.7	dB
Noise Floor	16.6	dB
Overload	142.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	63.6	59.1	56.9	59.2	57.1	52.5	48.6	47.1	43.7	39.6	34.0	22.7
LZSmax	79.2	76.1	71.9	76.8	73.7	67.8	61.4	61.6	62.2	60.6	56.1	43.5
LZSmin	46.0	50.3	48.3	49.0	40.2	38.3	35.9	34.9	28.9	21.7	14.6	12.5

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	60.6	58.4	56.5	54.5	54.8	53.7	52.0	51.2	53.3	52.0	56.8	52.6
LZSmax	73.5	75.0	74.1	66.5	71.6	73.4	68.3	65.5	71.8	63.7	76.7	67.4
LZSmin	37.8	39.7	40.2	42.8	43.0	44.1	43.8	41.8	43.2	44.2	43.7	42.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	49.9	54.4	51.6	50.2	46.0	45.0	44.7	43.5	43.4	42.7	42.1	42.3
LZSmax	62.8	72.4	69.8	67.5	59.9	55.6	56.6	54.0	60.6	56.6	56.2	60.4
LZSmin	27.5	37.9	35.4	32.6	29.7	32.2	30.9	30.8	30.4	30.2	29.9	28.4

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	39.7	39.2	37.3	35.7	35.0	33.6	31.7	28.3	25.6	20.7	16.6	11.5
LZSmax	53.9	58.6	58.0	56.3	56.0	56.0	54.1	49.6	47.4	41.7	37.6	30.8
LZSmin	26.0	23.2	21.1	18.8	16.0	13.5	11.5	9.1	7.5	6.8	8.3	7.8

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 12:46:08	-24.7
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.007
User	GT
Job Description	Talbert Extraction Well Destruction
Location	West of OCWD-P10 - Front Yard of 10092 Spirit Circle
Measurement Description	
Start Time	Tuesday, 2019 May 07 13:38:04
Stop Time	Tuesday, 2019 May 07 13:48:04
Duration	00:10:00.0
Run Time	00:00:53.3
Pause	00:09:06.7
Pre Calibration	Tuesday, 2019 May 07 12:46:08
Post Calibration	None
Calibration Deviation	---

Note

Approx 40 ft south of Spirit Cir CL and 510 ft east of Brookhurst St CL
67 F, 30.05 in Hg, 60% Hu, 7 mph wind, partly cloudy

Overall Data

LAeq		60.3	dB
LASmax	2019 May 07 13:38:57	76.9	dB
LApeak (max)	2019 May 07 13:38:56	86.5	dB
LASmin	2019 May 07 13:38:29	43.1	dB
LCeq		69.0	dB
LAeq		60.3	dB
LCeq - LAeq		8.7	dB
LAIeq		62.4	dB
LAeq		60.3	dB
LAIeq - LAeq		2.1	dB
Ldn		60.3	dB
LDay 07:00-22:00		60.3	dB
LNight 22:00-07:00		---	dB
Lden		60.3	dB
LDay 07:00-19:00		60.3	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		77.6	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		1	
OBA Overload Duration		0.1	s

Statistics

LAS5.00		52.6	dBA
LAS10.00		50.5	dBA
LAS33.30		47.7	dBA
LAS50.00		46.6	dBA
LAS66.60		45.9	dBA
LAS90.00		44.3	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)		1 / 0.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)		0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)		0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	25.8	dB
Under Range Peak	74.7	dB
Noise Floor	16.6	dB
Overload	142.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	66.9	60.9	56.1	55.0	54.5	47.5	52.1	54.3	51.9	52.3	48.6	43.0
LZSmax	81.9	74.8	67.7	60.2	63.3	62.5	68.4	70.9	68.7	69.1	65.5	59.9
LZSmin	50.5	50.1	51.3	51.1	49.8	42.0	38.3	39.2	32.7	26.8	19.7	13.2

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	61.5	64.4	61.0	58.0	56.2	53.0	49.6	50.6	52.0	49.7	50.8	50.1
LZSmax	73.0	78.8	74.5	72.0	69.2	65.6	60.2	62.9	61.9	58.9	56.0	54.4
LZSmin	45.9	42.5	44.4	44.0	45.4	43.8	40.7	44.5	46.8	44.7	46.1	45.9

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	51.9	48.9	47.3	43.8	41.9	41.9	40.1	47.3	45.4	47.4	51.0	47.9
LZSmax	57.8	60.9	59.4	56.0	47.4	49.2	50.2	63.8	61.3	63.7	67.7	64.5
LZSmin	43.0	41.7	39.3	38.3	35.7	36.6	33.1	29.8	33.3	34.0	35.3	31.7

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	44.3	46.9	49.0	50.6	46.7	44.8	45.0	43.3	42.6	39.8	38.6	34.9
LZSmax	60.7	63.6	65.9	67.5	63.6	61.7	61.9	60.2	59.5	56.7	55.5	51.8
LZSmin	29.9	27.3	24.8	23.3	21.6	20.7	17.2	13.2	10.1	7.7	9.3	8.0

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 12:46:08	-24.7
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.008
User	GT
Job Description	Talbert Extraction Well Destruction
Location	At OCWD-M57 on Galbar Circle east of 10091 Dana Drive
Measurement Description	
Start Time	Tuesday, 2019 May 07 13:53:05
Stop Time	Tuesday, 2019 May 07 14:03:05
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	Tuesday, 2019 May 07 12:46:08
Post Calibration	None
Calibration Deviation	---

Note

Approx 15 ft west of Galbar Cir CL and 70 ft north ofDana Dr CL
67 F, 30.05 in Hg, 60% Hu, 7 mph wind, partly cloudy

Overall Data

LAeq		50.2	dB
LASmax	2019 May 07 13:59:53	69.3	dB
LApeak (max)	2019 May 07 13:59:53	82.0	dB
LASmin	2019 May 07 14:02:41	39.9	dB
LCeq		60.2	dB
LAeq		50.2	dB
LCeq - LAeq		10.0	dB
LAIeq		52.6	dB
LAeq		50.2	dB
LAIeq - LAeq		2.4	dB
Ldn		50.2	dB
LDay 07:00-22:00		50.2	dB
LNight 22:00-07:00		---	dB
Lden		50.2	dB
LDay 07:00-19:00		50.2	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		78.0	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	53.5	dBA
LAS10.00	50.5	dBA
LAS33.30	47.3	dBA
LAS50.00	46.3	dBA
LAS66.60	45.4	dBA
LAS90.00	44.1	dBA

LAS > 65.0 dB (Exceedence Counts / Duration)	1 / 3.7	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	25.8	dB
Under Range Peak	74.7	dB
Noise Floor	16.6	dB
Overload	142.3	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	64.8	59.3	56.8	55.3	52.5	50.5	44.9	45.6	42.4	39.3	33.8	27.4
LZSmax	83.0	72.7	69.7	73.1	70.7	72.3	62.5	64.3	62.3	56.4	46.4	51.2
LZSmin	46.1	50.1	47.8	46.6	43.5	35.3	33.6	35.4	30.3	28.1	16.4	12.6

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	61.6	60.3	57.6	55.8	54.1	53.5	53.9	51.4	49.4	50.0	50.6	51.0
LZSmax	78.1	80.2	70.6	72.2	67.5	69.5	69.1	63.1	61.4	64.2	66.0	71.6
LZSmin	33.8	39.8	40.4	33.0	43.7	44.5	41.5	42.3	41.1	40.9	41.3	40.6

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	47.3	48.2	47.7	48.4	44.8	41.3	39.8	40.1	40.7	41.3	41.3	39.8
LZSmax	64.1	64.0	69.0	71.5	65.0	61.2	58.7	57.0	58.7	59.0	60.8	59.5
LZSmin	38.1	40.5	33.3	31.6	29.8	28.4	27.9	28.9	29.2	31.3	31.2	28.9

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	38.0	36.8	37.8	35.9	33.9	33.3	31.8	28.2	24.1	20.2	26.0	17.2
LZSmax	57.8	56.4	58.1	54.4	48.7	48.2	44.0	40.7	37.6	35.5	51.1	39.4
LZSmin	26.2	25.5	24.4	25.0	18.8	17.5	12.8	10.4	8.3	7.4	8.4	8.0

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	07 May 2019 12:46:08	-24.7
PRM831	07 May 2019 11:41:50	-25.6
PRM831	29 Apr 2019 09:04:32	-25.7
PRM831	07 Feb 2019 12:06:19	-25.3
PRM831	07 Feb 2019 11:34:23	-25.9
PRM831	20 Dec 2018 10:51:31	-26.0
PRM831	17 Dec 2018 14:56:06	-26.1
PRM831	04 Dec 2018 09:35:01	-25.5
PRM831	16 Nov 2018 13:58:18	-25.8
PRM831	24 Oct 2018 13:08:44	-26.1
PRM831	12 Oct 2018 09:55:27	-25.9

APPENDIX C

RCNM Model Phases 1 and 2 Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P1 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to North	Residential	61.7	61.7	61.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	15	6.3
Flat Bed Truck	No	40		74.3	15	6.3
Concrete Mixer Truck	No	40		78.8	15	6.3
Concrete Pump Truck	No	20		81.4	15	6.3
Compressor (air)	No	40		77.7	15	6.3
Pickup Truck	No	40		75	15	6.3

		Calculated (dBA)		Results			
				Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps		85.1	82.1	N/A	N/A	N/A	N/A
Flat Bed Truck		78.4	74.4	N/A	N/A	N/A	N/A
Concrete Mixer Truck		83.0	79.0	N/A	N/A	N/A	N/A
Concrete Pump Truck		85.6	78.6	N/A	N/A	N/A	N/A
Compressor (air)		81.8	77.8	N/A	N/A	N/A	N/A
Pickup Truck		79.2	75.2	N/A	N/A	N/A	N/A
	Total	**86**	**86**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P1 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to North	Residential	61.7	61.7	61.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	15	6.3
Flat Bed Truck	No	40		74.3	15	6.3
Flat Bed Truck	No	40		74.3	15	6.3
Pickup Truck	No	40		75	15	6.3
Pickup Truck	No	40		75	15	6.3
Pickup Truck	No	40		75	15	6.3

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		81.7	77.7	N/A	N/A	N/A	N/A
Flat Bed Truck		78.4	74.4	N/A	N/A	N/A	N/A
Flat Bed Truck		78.4	74.4	N/A	N/A	N/A	N/A
Pickup Truck		79.2	75.2	N/A	N/A	N/A	N/A
Pickup Truck		79.2	75.2	N/A	N/A	N/A	N/A
Pickup Truck		79.2	75.2	N/A	N/A	N/A	N/A
	Total	**82**	**83**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P2 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to North	Residential	49.8	49.8	49.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	65	7
Flat Bed Truck	No	40		74.3	65	7
Concrete Mixer Truck	No	40		78.8	65	7
Concrete Pump Truck	No	20		81.4	65	7
Compressor (air)	No	40		77.7	65	7
Pickup Truck	No	40		75	65	7

			Results			
	Calculated (dBA)		Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps	71.7	68.7	N/A	N/A	N/A	N/A
Flat Bed Truck	65.0	61.0	N/A	N/A	N/A	N/A
Concrete Mixer Truck	69.5	65.5	N/A	N/A	N/A	N/A
Concrete Pump Truck	72.1	65.1	N/A	N/A	N/A	N/A
Compressor (air)	68.4	64.4	N/A	N/A	N/A	N/A
Pickup Truck	65.7	61.7	N/A	N/A	N/A	N/A
Total	**72**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P2 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to North	Residential	49.8	49.8	49.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	65	7
Flat Bed Truck	No	40		74.3	65	7
Flat Bed Truck	No	40		74.3	65	7
Pickup Truck	No	40		75	65	7
Pickup Truck	No	40		75	65	7
Pickup Truck	No	40		75	65	7

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		68.3	64.3	N/A	N/A	N/A	N/A
Flat Bed Truck		65.0	61.0	N/A	N/A	N/A	N/A
Flat Bed Truck		65.0	61.0	N/A	N/A	N/A	N/A
Pickup Truck		65.7	61.7	N/A	N/A	N/A	N/A
Pickup Truck		65.7	61.7	N/A	N/A	N/A	N/A
Pickup Truck		65.7	61.7	N/A	N/A	N/A	N/A
	Total	**68**	**70**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P3 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to Northeast	Residential	63.1	63.1	63.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	60	6.3
Flat Bed Truck	No	40		74.3	60	6.3
Concrete Mixer Truck	No	40		78.8	60	6.3
Concrete Pump Truck	No	20		81.4	60	6.3
Compressor (air)	No	40		77.7	60	6.3
Pickup Truck	No	40		75	60	6.3

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps	73.1	70.0	N/A	N/A	N/A	N/A
Flat Bed Truck	66.4	62.4	N/A	N/A	N/A	N/A
Concrete Mixer Truck	70.9	66.9	N/A	N/A	N/A	N/A
Concrete Pump Truck	73.5	66.5	N/A	N/A	N/A	N/A
Compressor (air)	69.8	65.8	N/A	N/A	N/A	N/A
Pickup Truck	67.1	63.1	N/A	N/A	N/A	N/A
Total	**74**	**74**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P3 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to Northeast	Residential	63.1	63.1	63.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	60	6.3
Flat Bed Truck	No	40		74.3	60	6.3
Flat Bed Truck	No	40		74.3	60	6.3
Pickup Truck	No	40		75	60	6.3
Pickup Truck	No	40		75	60	6.3
Pickup Truck	No	40		75	60	6.3

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	69.7	65.7	N/A	N/A	N/A	N/A
Flat Bed Truck	66.4	62.4	N/A	N/A	N/A	N/A
Flat Bed Truck	66.4	62.4	N/A	N/A	N/A	N/A
Pickup Truck	67.1	63.1	N/A	N/A	N/A	N/A
Pickup Truck	67.1	63.1	N/A	N/A	N/A	N/A
Pickup Truck	67.1	63.1	N/A	N/A	N/A	N/A
Total	**70**	**71**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P4 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Business to Southeast	Commercial	63	63	63

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	110	0
Flat Bed Truck	No	40		74.3	110	0
Concrete Mixer Truck	No	40		78.8	110	0
Concrete Pump Truck	No	20		81.4	110	0
Compressor (air)	No	40		77.7	110	0
Pickup Truck	No	40		75	110	0

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps	74.1	71.1	N/A	N/A	N/A	N/A
Flat Bed Truck	67.4	63.4	N/A	N/A	N/A	N/A
Concrete Mixer Truck	72.0	68.0	N/A	N/A	N/A	N/A
Concrete Pump Truck	74.6	67.6	N/A	N/A	N/A	N/A
Compressor (air)	70.8	66.8	N/A	N/A	N/A	N/A
Pickup Truck	68.2	64.2	N/A	N/A	N/A	N/A
Total	**75**	**75**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P4 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Business to Southeast	Commercial	63	63	63

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	110	0
Flat Bed Truck	No	40		74.3	110	0
Flat Bed Truck	No	40		74.3	110	0
Pickup Truck	No	40		75	110	0
Pickup Truck	No	40		75	110	0
Pickup Truck	No	40		75	110	0

		Calculated (dBA)		Results			
				Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		70.7	66.7	N/A	N/A	N/A	N/A
Flat Bed Truck		67.4	63.4	N/A	N/A	N/A	N/A
Flat Bed Truck		67.4	63.4	N/A	N/A	N/A	N/A
Pickup Truck		68.2	64.2	N/A	N/A	N/A	N/A
Pickup Truck		68.2	64.2	N/A	N/A	N/A	N/A
Pickup Truck		68.2	64.2	N/A	N/A	N/A	N/A
	Total	**71**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P6 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to West	Residential	50.7	50.7	50.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	30	0
Flat Bed Truck	No	40		74.3	30	0
Concrete Mixer Truck	No	40		78.8	30	0
Concrete Pump Truck	No	20		81.4	30	0
Compressor (air)	No	40		77.7	30	0
Pickup Truck	No	40		75	30	0

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps	85.4	82.4	N/A	N/A	N/A	N/A
Flat Bed Truck	78.7	74.7	N/A	N/A	N/A	N/A
Concrete Mixer Truck	83.2	79.3	N/A	N/A	N/A	N/A
Concrete Pump Truck	85.8	78.8	N/A	N/A	N/A	N/A
Compressor (air)	82.1	78.1	N/A	N/A	N/A	N/A
Pickup Truck	79.4	75.5	N/A	N/A	N/A	N/A
Total	**86**	**87**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P6 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to West	Residential	50.7	50.7	50.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	30	0
Flat Bed Truck	No	40		74.3	30	0
Flat Bed Truck	No	40		74.3	30	0
Pickup Truck	No	40		75	30	0
Pickup Truck	No	40		75	30	0
Pickup Truck	No	40		75	30	0

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	82.0	78.0	N/A	N/A	N/A	N/A
Flat Bed Truck	78.7	74.7	N/A	N/A	N/A	N/A
Flat Bed Truck	78.7	74.7	N/A	N/A	N/A	N/A
Pickup Truck	79.4	75.5	N/A	N/A	N/A	N/A
Pickup Truck	79.4	75.5	N/A	N/A	N/A	N/A
Pickup Truck	79.4	75.5	N/A	N/A	N/A	N/A
Total	**82**	**84**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P7 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to East	Residential	52.2	52.2	52.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	20	6.3
Flat Bed Truck	No	40		74.3	20	6.3
Concrete Mixer Truck	No	40		78.8	20	6.3
Concrete Pump Truck	No	20		81.4	20	6.3
Compressor (air)	No	40		77.7	20	6.3
Pickup Truck	No	40		75	20	6.3

		Calculated (dBA)		Results			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps		82.6	79.6	N/A	N/A	N/A	N/A
Flat Bed Truck		75.9	71.9	N/A	N/A	N/A	N/A
Concrete Mixer Truck		80.5	76.5	N/A	N/A	N/A	N/A
Concrete Pump Truck		83.1	76.1	N/A	N/A	N/A	N/A
Compressor (air)		79.3	75.3	N/A	N/A	N/A	N/A
Pickup Truck		76.7	72.7	N/A	N/A	N/A	N/A
	Total	**83**	**84**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P7 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to East	Residential	52.2	52.2	52.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	20	6.3
Flat Bed Truck	No	40		74.3	20	6.3
Flat Bed Truck	No	40		74.3	20	6.3
Pickup Truck	No	40		75	20	6.3
Pickup Truck	No	40		75	20	6.3
Pickup Truck	No	40		75	20	6.3

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		79.2	75.2	N/A	N/A	N/A	N/A
Flat Bed Truck		75.9	71.9	N/A	N/A	N/A	N/A
Flat Bed Truck		75.9	71.9	N/A	N/A	N/A	N/A
Pickup Truck		76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck		76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck		76.7	72.7	N/A	N/A	N/A	N/A
	Total	**79**	**81**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P10 - Phase 1 - Extraction Well Destruction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to West	Residential	60.3	60.3	60.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	270	5.4
Flat Bed Truck	No	40		74.3	270	5.4
Concrete Mixer Truck	No	40		78.8	270	5.4
Concrete Pump Truck	No	20		81.4	270	5.4
Compressor (air)	No	40		77.7	270	5.4
Pickup Truck	No	40		75	270	5.4

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps		60.9	57.9	N/A	N/A	N/A	N/A
Flat Bed Truck		54.2	50.2	N/A	N/A	N/A	N/A
Concrete Mixer Truck		58.8	54.8	N/A	N/A	N/A	N/A
Concrete Pump Truck		61.4	54.4	N/A	N/A	N/A	N/A
Compressor (air)		57.6	53.6	N/A	N/A	N/A	N/A
Pickup Truck		55.0	51.0	N/A	N/A	N/A	N/A
	Total	**61**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: OCWD-P10 - Phase 2 - Removal of Concrete Well Vaults

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Home to West	Residential	60.3	60.3	60.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	270	5.4
Flat Bed Truck	No	40		74.3	270	5.4
Flat Bed Truck	No	40		74.3	270	5.4
Pickup Truck	No	40		75	270	5.4
Pickup Truck	No	40		75	270	5.4
Pickup Truck	No	40		75	270	5.4

			Results			
	Calculated (dBA)			Noise Limits (dBA)		
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	57.5	53.5	N/A	N/A	N/A	N/A
Flat Bed Truck	54.2	50.2	N/A	N/A	N/A	N/A
Flat Bed Truck	54.2	50.2	N/A	N/A	N/A	N/A
Pickup Truck	55.0	51.0	N/A	N/A	N/A	N/A
Pickup Truck	55.0	51.0	N/A	N/A	N/A	N/A
Pickup Truck	55.0	51.0	N/A	N/A	N/A	N/A
Total	**58**	**59**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

RCNM Model Phase 3 Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: Phase 3 - Pipeline Abandoment

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to Adams Ave Pipeline	Residential	61.7	61.7	61.7

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	20	6.3
Flat Bed Truck	No	40		74.3	20	6.3
Roller	No	20		80.0	20	6.3
Concrete Mixer Truck	No	40		78.8	20	6.3
Concrete Pump Truck	No	20		81.4	20	6.3
Pickup Truck	No	40		75.0	20	6.3
Pickup Truck	No	40		75.0	20	6.3
Pickup Truck	No	40		75.0	20	6.3

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Backhoe	79.2	75.2	N/A	N/A	N/A	N/A
Flat Bed Truck	75.9	71.9	N/A	N/A	N/A	N/A
Roller	81.7	74.7	N/A	N/A	N/A	N/A
Concrete Mixer Truck	80.5	76.5	N/A	N/A	N/A	N/A
Concrete Pump Truck	83.1	76.1	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Total	**83**	**83**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: Phase 3 - Pipeline Abandoment

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to Atlanta Ave Pipeline	Residential	52	52	52.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	20	6.3
Flat Bed Truck	No	40		74.3	20	6.3
Roller	No	20		80	20	6.3
Concrete Mixer Truck	No	40		78.8	20	6.3
Concrete Pump Truck	No	20		81.4	20	6.3
Pickup Truck	No	40		75	20	6.3
Pickup Truck	No	40		75	20	6.3
Pickup Truck	No	40		75	20	6.3

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Backhoe	79.2	75.2	N/A	N/A	N/A	N/A
Flat Bed Truck	75.9	71.9	N/A	N/A	N/A	N/A
Roller	81.7	74.7	N/A	N/A	N/A	N/A
Concrete Mixer Truck	80.5	76.5	N/A	N/A	N/A	N/A
Concrete Pump Truck	83.1	76.1	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Pickup Truck	76.7	72.7	N/A	N/A	N/A	N/A
Total	**83**	**83**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/9/2019
Case Description: Phase 3 - Pipeline Abandoment

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to Bushard St Pipeline	Residential	52	52	52.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	40	6.3
Flat Bed Truck	No	40		74.3	40	6.3
Roller	No	20		80	40	6.3
Concrete Mixer Truck	No	40		78.8	40	6.3
Concrete Pump Truck	No	20		81.4	40	6.3
Pickup Truck	No	40		75	40	6.3
Pickup Truck	No	40		75	40	6.3
Pickup Truck	No	40		75	40	6.3

Equipment		Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Backhoe		73.2	69.2	N/A	N/A	N/A	N/A
Flat Bed Truck		69.9	65.9	N/A	N/A	N/A	N/A
Roller		75.6	68.6	N/A	N/A	N/A	N/A
Concrete Mixer Truck		74.4	70.5	N/A	N/A	N/A	N/A
Concrete Pump Truck		77.0	70.0	N/A	N/A	N/A	N/A
Pickup Truck		70.6	66.7	N/A	N/A	N/A	N/A
Pickup Truck		70.6	66.7	N/A	N/A	N/A	N/A
Pickup Truck		70.6	66.7	N/A	N/A	N/A	N/A
	Total	**77**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX E

RCNM Model Phase 4 Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/10/2019
Case Description: Phase 4 - Monitoring Well Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to West	Residential	50.2	50.2	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Vacuum Excavator (Vac-truck)	No	40		85.3	20	7.2
Drill Rig Truck	No	20		79.1	20	7.2
Slurry Plant	No	100		78.0	20	7.2
Flat Bed Truck	No	40		74.3	20	7.2
Gradall	No	40		83.4	20	7.2
Pumps	No	50		80.9	20	7.2
Compressor (air)	No	40		77.7	20	7.2
Generator (<25KVA, VMS signs)	No	50		72.8	20	7.2
Pickup Truck	No	40		75.0	20	7.2
Pickup Truck	No	40		75.0	20	7.2

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Vacuum Excavator (Vac-truck)	86.1	82.1	N/A	N/A	N/A	N/A
Drill Rig Truck	79.9	72.9	N/A	N/A	N/A	N/A
Slurry Plant	78.8	78.8	N/A	N/A	N/A	N/A
Flat Bed Truck	75.0	71.0	N/A	N/A	N/A	N/A
Gradall	84.2	80.2	N/A	N/A	N/A	N/A
Pumps	81.7	78.7	N/A	N/A	N/A	N/A
Compressor (air)	78.4	74.4	N/A	N/A	N/A	N/A
Generator (<25KVA, VMS signs)	73.6	70.6	N/A	N/A	N/A	N/A
Pickup Truck	75.8	71.8	N/A	N/A	N/A	N/A
Pickup Truck	75.8	71.8	N/A	N/A	N/A	N/A
Total	**86**	**87**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/10/2019
Case Description: Phase 4 - Monitoring Well Construction

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to East	Residential	50	50	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Vacuum Excavator (Vac-truck)	No	40		85.3	65	0
Drill Rig Truck	No	20		79.1	65	0
Slurry Plant	No	100		78.0	65	0
Flat Bed Truck	No	40		74.3	65	0
Gradall	No	40		83.4	65	0
Pumps	No	50		80.9	65	0
Compressor (air)	No	40		77.7	65	0
Generator (<25KVA, VMS signs)	No	50		72.8	65	0
Pickup Truck	No	40		75.0	65	0
Pickup Truck	No	40		75.0	65	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Vacuum Excavator (Vac-truck)	83.0	79.0	N/A	N/A	N/A	N/A
Drill Rig Truck	76.9	69.9	N/A	N/A	N/A	N/A
Slurry Plant	75.7	75.7	N/A	N/A	N/A	N/A
Flat Bed Truck	72.0	68.0	N/A	N/A	N/A	N/A
Gradall	81.1	77.1	N/A	N/A	N/A	N/A
Pumps	78.7	75.7	N/A	N/A	N/A	N/A
Compressor (air)	75.4	71.4	N/A	N/A	N/A	N/A
Generator (<25KVA, VMS signs)	70.5	67.5	N/A	N/A	N/A	N/A
Pickup Truck	72.7	68.7	N/A	N/A	N/A	N/A
Pickup Truck	72.7	68.7	N/A	N/A	N/A	N/A
Total	**83**	**84**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX F

RCNM Model Monitoring Well Operational Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/10/2019
Case Description: Monitoring Well Operations - Well Sampling

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to West	Residential	50.2	50.2	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Generator (<25KVA, VMS signs)	No	50		72.8	20	7.2

	Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Generator (<25KVA, VMS signs)	73.6	70.6	N/A	N/A	N/A	N/A
Total	**74**	**71**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to East	Residential	50.2	50.2	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Generator (<25KVA, VMS signs)	No	50.0		72.8	65	0

	Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Generator (<25KVA, VMS signs)	70.5	67.5	N/A	N/A	N/A	N/A
Total	**71**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/10/2019
Case Description: Monitoring Well Operations - Well Redevelopment

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to West	Residential	50.2	50.2	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	20	7.2
Compressor (air)	No	40		77.7	20	7.2
Pickup Truck	No	40		75.0	20	7.2

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Pumps	81.7	78.7	N/A	N/A	N/A	N/A
Compressor (air)	78.4	74	N/A	N/A	N/A	N/A
Pickup Truck	75.8	71.8	N/A	N/A	N/A	N/A
Total	**82**	**81**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Home to East	Residential	50.2	50.2	50.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50.0		80.9	65	0
Compressor (air)	No	40.0		77.7	65	0
Pickup Truck	No	40.0		75.0	65	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Pumps	78.7	75.7	N/A	N/A	N/A	N/A
Compressor (air)	75.4	71.4	N/A	N/A	N/A	N/A
Pickup Truck	72.7	68.7	N/A	N/A	N/A	N/A
Total	**79**	**78**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.