IBERDROLA RENEWABLES

May 12, 2010

Mr. Iain Fisher
CEQA Project Manager
Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102-3296

Re: Tule Wind Project - Response to Data Request No. 4

Dear Mr. Fisher:

Pacific Wind Development, Inc., a wholly owned subsidiary of Iberdrola Renewables, Inc. (IBR) received your Data Request No. 4 regarding the Tule Wind Project. Enclosed is IBR's response.

If you have questions regarding this information, please contact me at 503.796.7781 or Shannon D'Agostino at 703.752.7755 ext. 113.

Sincerely,

Jeffrey Durocher
Wind Permitting Manager

cc (via e-mail): Greg Thomsen, BLM (GThomsen@blm.gov)
Thomas Zale, BLM (Thomas_Zale@blm.gov)
Jeffery Childers, BLM (jchilders@blm.gov)
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Encl.

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# Tule Wind Project
# Iberdrola Renewables, Inc.

# Response to CPUC Data Request No. 4

**May 2010**

*Prepared for*

**California Public Utilities Commission**
**505 Van Ness Avenue**
**San Francisco, CA 94102-3298**

*Prepared by*

**HDR Engineering, Inc.**

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HDR

## Question 1:

*Please provide the vehicle truck mix percentages used to determine the existing exterior CNEL along the roads in the noise study report Table 5 and the rational for selecting the existing truck percentages.*

## Response:

Existing vehicular classification counts provided in the noise technical report submitted on May 2, 2010 were based on a mix of 93 percent cars, 4 percent medium trucks and 3 percent heavy trucks. More detailed vehicular classification counts have been obtained and will be incorporated into the revised noise technical report.

**Appendix A,** attached hereto, summarizes the changes to the roadway noise analysis. The following table summarizes the revised vehicular mix used to determine the existing exterior CNEL along study roads. The existing vehicular mix on Ribbonwood Road, McCain Valley Road, and Old Highway 80 are based on vehicular classification counts. On roadway segments where vehicular classification counts were unavailable, a mix of 93 percent cars, 4 percent medium trucks and 3 percent heavy trucks was assumed.

| Roadway | Vehicular Mix (%) | | | | |
|---|---|---|---|---|---|
| | Auto | Medium Truck | Heavy Truck | Bus | Motorcycle |
| Crestwood Road | 93 | 4 | 3 | 0 | 0 |
| McCain Valley Road | 73 | 25 | 1 | 1 | 0 |
| Old Highway 80 | 84 | 15 | 1 | 0 | 0 |
| Ribbonwood Road (north of I-8) | 86 | 10 | 2 | 0 | 2 |
| Ribbonwood Road (I-8 to Old Highway 80) | 83 | 13 | 3 | 0 | 1 |

Detailed vehicular classification counts are provided in **Appendix B.**

## Question 2:

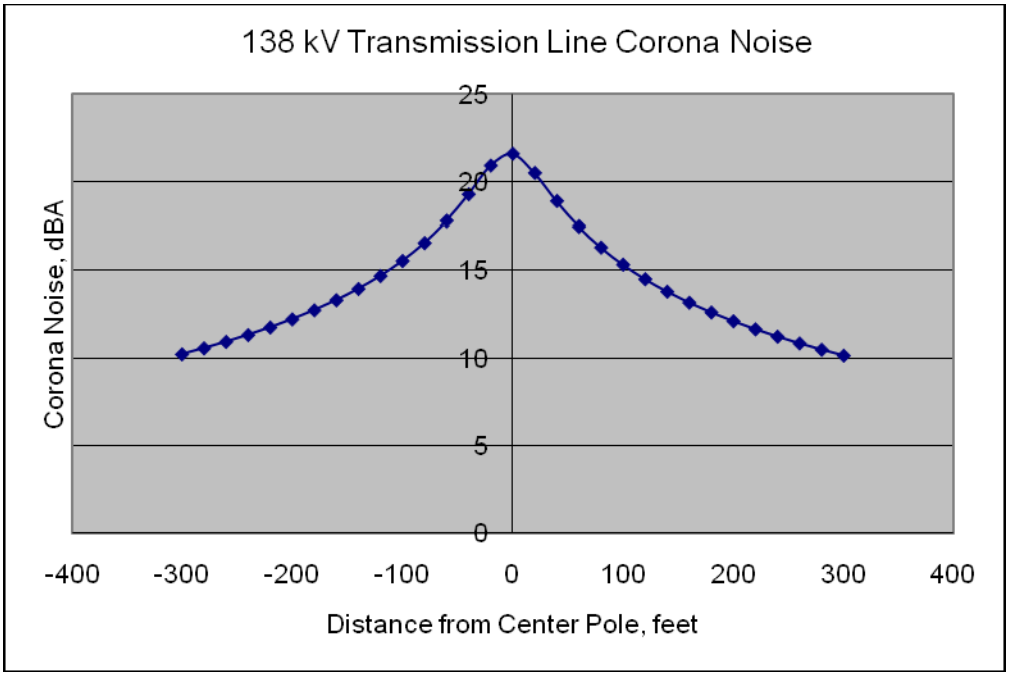
*138 kV Transmission line corona noise—Please explain how it was determined that the proposed 138 kV line has been properly designed so the corona noise does not to exceed the County's noise ordinance requirements at the proposed right-of-way setback distance. Please provide the proposed right-of-way setback distance.*

## Response:

The 138 kV project transmission line and poles will be located within a 100-foot right-of-way easement. The proposed transmission line will have three conductors supported by insulators on single-shaft steel poles that will either be galvanized or coated with a weathered steel finish to resemble wood. Tule corona noise was assessed using the Bonneville model and worst-case sag conditions.

Based on the corona noise model, using typical 138 kV single-circuit transmission line configuration, transmission line noise will comply with the County's noise ordinance requirements at the 100-foot right-

of-way. Predicted corona noise levels at the right-of-way are predicted to be 26 dBA below the county nighttime noise level limits.




Question 3:

*Substation operational noise—Please explain how it was determined that the proposed substation has been properly designed so as not to exceed the County's noise ordinance requirements.*

Response:

Noise from the proposed substation is predicted to comply with San Diego County noise ordinance requirements at adjacent property boundaries. A preliminary noise analysis of the proposed, deviant and alternate substation is provided in **Appendix C**. Maximum calculated noise levels at nearby property boundaries are 10 to 45 dB below the San Diego County nighttime sound level limits.

Cumulative noise from project operations, including the proposed substation and wind turbine generated noise will be further evaluated in the revised noise technical report.

Question 4:

*Construction noise—Please determine the construction noise impacts at the property lines (rather than at the homes) per County noise ordinance requirements.*

Response:

Construction noise was re-evaluated for all construction conditions; Roadway Construction, Underground Utilities Construction and Tower Base Construction, High Voltage Line (HVTL) Construction activities and the operation of a cement batch plant. All conditions were re-analyzed with distances corresponding

to the plat lines as supplied to HDR, and not the residential location as was performed in the original analysis.

**Appendix D** details the results of the revised construction noise analysis. Revised construction noise impacts will be incorporated into the revised noise technical report.

### Question 5:

> *138 kV Transmission line construction noise—Please evaluate the construction noise impacts at the nearby residences along the transmission line alignment south of I-8. Also, are the 138 kV transmission line construction noise impacts for the receptors north of I-8 included in the noise report Table 13?*

### Response:

The transmission line construction noise analysis has been revised, per the PUCs comment by incorporating noise-sensitive receptors both north and south of I-8. The previous construction analysis, summarized in Table 13, included noise sensitive receptors. Detailed results of the transmission line construction noise analysis can be found in **Appendix D**. The HVTL Construction Condition incorporates all alternatives as each receptor was modeled nearest to its corresponding alternative, thereby deriving worse case impacts offered in each alternative. Mitigation of noise impacts associated with each condition are discussed below.

### Question 6:

> *Cement batch plant noise—Please discuss the noise impacts associated with the cement batch plant.*

### Response:

Noise from the proposed cement batch plant was analyzed at all receptors within the project boundary. Within the analysis, it was assumed the batch plant would be 100 percent utilized (a full 8-hour work cycle) yielding worse case results at each receptor. Results indicate that all receptors will be below the San Diego County noise ordinance by a minimum of 12 dB while the batch plant is in operation. **Appendix C** details noise levels at all receptors while the batch plant is in operation.

### Question 7:

> *Construction Noise Mitigation—Please demonstrate the preliminary feasibility of the noise mitigation measures by quantifying the anticipated noise reduction associated with the recommended mitigation. For example, how high a noise barrier will be required to mitigate the noise to 75 dBA Leq(8) at the receptors Home 6 and Home 7, and what will be the associated noise level reduction? Where will the noise barriers be placed? If a noise barrier will not fully mitigate, or other mitigation alternatives are anticipated, please identify and quantify the anticipated noise reduction that would result from other noise mitigation measures.*

### Response:

As discussed within appendix D, noise mitigation is difficult to quantify due to the lack of a construction or vehicle type schedule. However, it has been determined that a 24-foot high, portable, flexible barrier with a high STC value (30+), noise reductions could be as high as 10 dB within the barriers shadow zone and assuming a 16-foot exhaust stack height for a typical dump truck and front end loader. Additional reductions totaling 20 dB can be achieved through exhaust silencers, maintenance upgrades, and time constraints on the loudest pieces of equipment limiting their utilization to 50 percent (or 4 hours per work day).

## Question 8:

*Vibration—Please determine the construction vibration levels at the closest receptors.*

## Response:

There is potential for blasting in some places during construction to remove rock. General areas or exact locations will be identified by results of a geotechnical investigation. Construction blasting will be planned, in part, where it will cause less noise and vibration than non-blasting construction methods. Construction blasting will be managed with the preparation of a blasting plan for each site. The blasting plan will include identification of planned blasting locations, a description of the planned blasting methods, an inventory of vulnerable structures potentially affected by the planned blasting, and calculations to determine the area affected by the planned blasting.

Construction blasting will create unavoidable groundborne vibration. Vibration propagation is highly dependent on soil conditions between the blast and the receptor. In some soil conditions, groundborne vibration dissipates quickly. Construction blasting may need to be coordinated with building occupants to occur in their absence, or at other acceptable times, to avoid nuisance or annoyance complaints.

Physical damage to the structures will be addressed by avoiding construction blasting near vulnerable structures wherever possible. Alternative non-blasting construction methods will be evaluated. A rock anchoring or mini-pile system may be used to reduce the risk of damage to structures. Structures shall be restored if adversely affected by construction vibration, to an equivalent condition as that prior to the construction. Fair compensation, as appropriate, will be provided to the owner.

## Question 9:

*Blasting—Please evaluate blasting noise impacts at the closest property lines and compare to the County's impulsive noise criteria.*

## Response:

There is potential for blasting in some places during construction to remove rock. General areas or exact locations will be identified by results of a geotechnical investigation. Construction blasting will be planned, in part, where it will cause less noise and vibration than non-blasting construction methods. Construction blasting will be managed with the preparation of a blasting plan for each site. The blasting plan will include identification of planned blasting locations, a description of the planned blasting methods, an inventory of vulnerable structures potentially affected by the planned blasting, and calculations to determine the area affected by the planned blasting.

Blasting will create an impulse sound, a very short-duration sound with a sharp peak in magnitude. Generally impulsive sounds are less than 1 second in duration, rise and decay 20 dB in less than 250 milliseconds. Blasting impulsive noise generally rises even more quickly. The actual peak sound pressure level, as well as the duration, rise time and decay time, depend upon the local environment and propagation characteristics. As will any other sound pressure level, the magnitude falls as distance from the blast increases.

San Diego Code Section 36.410, "Sound Level Limitations on Impulsive Noise," regulates impulsive noise. The code limit for residential, village zoning or civic use is a 1-minute maximum sound level of 82 dBA* for 75 percent of the minutes within in a measurement period (one-hour minimum period), but exceedances are allowed for 25 percent of the minutes. Construction blasting may exceed the limit at certain locations, but blasting can be planned to occur infrequently enough that it does not exceed the limit for more than 15 minutes of any hour.

San Diego Code Section 36.409, "Sound Level Limitations on Construction Equipment," limits the overall construction noise level to an eight-hour average sound level of 75 dBA. Some construction blasting can be planned to occur infrequently enough that it does not increase the average construction noise above the limit. Other construction blasting may need to be coordinated with building occupants to occur in their absence, or at other acceptable times, to avoid nuisance or annoyance complaints.

## Question 10:

*Alternatives Transmission Line #1, #2, #3—At locations where the transmission line alternative alignments are appreciably closer than the Proposed Project alignment, please quantify the construction noise and vibration levels at adjacent properties associated with the alternatives. Also, please demonstrate that the corona noise will comply with the County's noise ordinance criteria.*

## Response:

The HVTL Construction Condition incorporates all alternatives as each receptor was modeled nearest to its corresponding alternative, thereby deriving worse case impacts offered in each alternative. Appendix D provides detailed results of the transmission line construction analysis.

Most limits on construction vibration are based on minimizing the potential for damage to nearby structures. The table below presents CALTRANs construction vibration damage thresholds. The construction activity that is most commonly associated with building damage is blasting during mining operations or excavation. Other vibration-producing construction equipment proposed for use on the Tule Project includes loaded trucks and bull dozers.

**Vibration Induced Damage Impact Threshold**

| Structure and Condition | Maximum PPV (in/sec) | |
|---|---|---|
| | Transient Sources[1] | Continuous/ Frequent Intermittent Sources[2] |
| Extremely fragile historic buildings, ruins, ancient monuments | 0.12 | 0.08 |
| Fragile buildings | 0.2 | 0.1 |

| Structure and Condition | Maximum PPV (in/sec) | |
|---|---|---|
| | Transient Sources[1] | Continuous/ Frequent Intermittent Sources[2] |
| Historic and some old buildings | 0.5 | 0.25 |
| Older residential structures | 0.5 | 0.3 |
| Newer residential structures | 1.0 | 0.5 |
| Modern industrial / commercial buildings | 2.0 | 0.5 |

Source: Jones & Stokes. 2004. Transportation – and construction-induced vibration guidance manual. June. (J&S 02-039.) Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA.

Notes:

[1] Transient sources creat a single, isolated vibration even, such as blasting or drop balls.

[2] Continuous / frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers and vibratory compaction equipment.

At a distance of 25 feet construction related vibration, with the exception of blasting, will comply with the historic building impact criteria. There are no old historic structures located within 25 of the transmission line construction limits.

At a distance of 15 feet construction related vibration, with the exception of blasting, will comply with the impact criteria for older residential structures. There are no vibration sensitive residential structures located within 15 of the transmission line construction limits.

There is potential for blasting in some places during construction to remove rock. General areas or exact locations will be identified by results of a geotechnical investigation. Construction blasting will be planned, in part, where it will cause less noise and vibration than non-blasting construction methods. Construction blasting will be managed with the preparation of a blasting plan for each site. The blasting plan will include identification of planned blasting locations, a description of the planned blasting methods, an inventory of vulnerable structures potentially affected by the planned blasting, and calculations to determine the area affected by the planned blasting.

Construction blasting will create unavoidable groundborne vibration. Vibration propagation is highly dependent on soil conditions between the blast and the receptor. In some soil conditions, groundborne vibration dissipates quickly. Construction blasting may need to be coordinated with building occupants to occur in their absence, or at other acceptable times, to avoid nuisance or annoyance complaints.

Physical damage to the structures will be addressed by avoiding construction blasting near vulnerable structures wherever possible. Alternative non-blasting construction methods will be evaluated. A rock anchoring or mini-pile system may be used to reduce the risk of damage to structures. Structures shall be restored if adversely affected by construction vibration, to an equivalent condition as that prior to the construction. Fair compensation for lost use will be provided to the owner.

The 138 kV project transmission line and poles will be located within a 100-foot right-of-way easement. The proposed transmission line will have three conductors supported by insulators on single-shaft steel poles that will either be galvanized or coated with a weathered steel finish to resemble wood. Tule corona noise was assessed using the Bonneville model and worst-case sag conditions.

Based on the corona noise model, using typical 138 kV single-circuit transmission line configuration, transmission line noise will comply with the County's noise ordinance requirements at the 100-foot right-of-way. Predicted corona noise levels at the right-of-way are predicted to be 26 dBA below the county nighttime noise level limits.

# APPENDIX A
# Traffic Noise Analysis Revisions

# NOISE SENSITIVE LAND USES (NSLU) AFFECTED BY AIRBORNE NOISE

## Guidelines for Determination of Significance

Determination of significance, for airborne noise caused by vehicular traffic, was performed in compliance with Section 4b of the San Diego County Noise Element. Significant noise impacts were identified if project implementation would result in noise levels in excess of any of the following:

- Exterior noise levels above 60 dBA, on a CNEL basis, at any noise sensitive land use.
- An increase in noise level of 10 dB, on a CNEL basis, over pre-existing noise conditions.
- Interior noise levels exceeding 45 dBA, on a CNEL basis.

## Potential Noise Impacts

The project is proposing roadway improvement and new roadways to facilitate the delivery of large equipment and cranes during project construction. The roadways and access roads that will carry project-related traffic span across federal, state and private lands.

HDR modeled project-related noise from four roadway segments and access roads in the project area. Predicted noise levels at NSLUs are compared with Section 4b of the San Diego County Noise Element and the Guidelines for Determining Significance for Noise to determine compliance.

Only those NSLUs that are on privately owned lands, under the County jurisdiction are being considered in the noise analysis which includes 45 residential structures.

## Potential Build-out Noise Conditions and Impacts

Determination of significance, for project-related airborne noise caused by vehicular traffic, was performed in compliance with Section 4b of the San Diego County Noise Element. Existing and project-related traffic were modeled using the TNM Lookup Program Version 2.5.

Existing noise sources in the area include traffic noise from I-8, local vehicular traffic, and occasional aircraft overflights. **Table 1** lists the existing average daily traffic volumes and vehicular mix of the primary roadways in the project area.

**Table 1. Existing Traffic Volumes**

| Roadway | ADT | Speed Limit (mph) | Vehicular Mix (%) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Auto | Medium Truck | Heavy Truck | Bus | Motorcycle |
| Crestwood Road | 1060 | 35 | 93 | 4 | 3 | 0 | 0 |
| McCain Valley Road | 110 | 35 | 73 | 25 | 1 | 1 | 0 |
| Old Highway 80 | 990 | 35 | 84 | 15 | 1 | 0 | 0 |
| Ribbonwood Road (north of I-8) | 270 | 35 | 86 | 10 | 2 | 0 | 2 |
| Ribbonwood Road (I-8 to Old Highway 80) | 1230 | 55 | 83 | 13 | 3 | 0 | 1 |

Source: "Full Traffic Impact Study: Tule Wind Project." LLG Ref. 3-09-1935. March 26 2010.

The existing vehicular mix on Ribbonwood Road, McCain Valley Road, and Old Highway 80 are based on vehicular classification counts taken on December 15, 2009. On roadway segments where vehicular classification counts were unavailable a conservative mix of 93 percent cars, 4 percent medium trucks and 3 percent heavy trucks was assumed.

**Table 2** lists the project-related average daily traffic and peak hourly volumes on the primary construction haul roads.

**Table 2. Project Construction-Related Traffic Volumes**

| Roadway | ADT | Speed Limit (mph) | Vehicle Mix | |
|---|---|---|---|---|
| | | | Cars | Heavy Truck |
| Crestwood Road | 390 | 35[1] | 148 | 242 |
| McCain Valley Road | 65 | 35 | 25 | 40 |
| Old Highway 80 | 65 | 35[1] | 25 | 40 |
| Ribbonwood Road (north of I-8) | 195 | 35[1] | 74 | 121 |
| Ribbonwood Road (I-8 to Old Highway 80) | 65 | 55 | 25 | 40 |

Source: "Full Traffic Impact Study: Tule Wind Project". LLG Ref. 3-09-1935. March 26 2010.

Modeled vehicular mixes for all project-related traffic are based on a traffic distribution of 62 percent heavy trucks and 38 percent cars.

HDR modeled existing, project-related, and existing + project-related average daily traffic volumes and calculated the community noise exposure levels at the nearest noise-sensitive land uses within 1/2 mile of the project area. **Table 3** summarizes the results of the traffic noise analysis.

**Table 3. Traffic Noise Summary**

| Receiver | Distance to Nearest NSLU, feet | Existing Exterior CNEL, dBA | Project Exterior CNEL, dBA | Existing + Project | Increase Over Existing |
|---|---|---|---|---|---|
| Crestwood | 4,000 | No Noise Sensitive Receptors within 1/2 Mile | | | |
| McCain | 400 | 46.5 | 46.9 | 51.6 | 5.1 |
| Old Highway 80 | 50 | 64.3 | 56.5 | 65.5 | 1.2 |
| Ribbonwood (North of I-8) | 250 | 51.1 | 53.2 | 58.0 | 6.9 |
| Ribbonwood (South of I-8) | 80 | 68.3 | 56.4 | 69.0 | 0.7 |

Existing traffic related noise levels in the area range from 46 to 68 dBA on a CNEL basis. Project-related noise levels, during the peak of project construction, range from 47 to 57 dBA on a CNEL basis. Predicted increases in noise level, due to project-related traffic, ranges from 1 dBA to 7 dBA on a CNEL basis at NSLU's.

Direct roadway noise impacts would be considered significant if the project increases noise levels for a noise sensitive land above the County of San Diego 60 dBA CNEL standard, except if the existing noise level without the project is 58 dBA or greater, a 3 dBA increase is allowed up to the maximum permitted by the Federal Highway Administration Standards or if the project permanently increase the noise levels by 10 dBA CNEL. The project creates an increase of more than 3.0 dBA CNEL along a segment of

[1] Based on maximum anticipated travel speed.

McCain and Ribbonwood as can be seen in **Table 3**, but does not increase the existing noise levels above the 60 dBA CNEL County threshold to noise sensitive areas. Based on the modeled results shown in **Table 3** above, no roadway impacts are anticipated.

During normal operations the Tule Project is expected to generate minimal traffic on access roads, therefore only vehicular trips during the construction phase were modeled. Post-construction the project is expected to be supported by 12 permanent full-time employees. It is anticipated that operational traffic would occur during normal business hours.

Project-related traffic noise is not predicted to cause any significant airborne-noise impacts at any NSLU near the project-area. The highest overall predicted traffic noise level, expressed as a community noise equivalent level (CNEL) is 57 dBA at the exterior of a NSLU.

Noise-sensitive land uses currently approaching the 60 dBA CNEL benchmark such as Old Highway 80 and Ribbonwood south of I-8, were assessed to determine if the project created a 3 dBA increase over existing noise levels. Increases over existing noise levels for Old Highway 80 and Ribbonwood south of I-8 where 1 dB and less than 1 dB, respectively.

### Design Considerations and Mitigation Measures

Project-related transportation related noise is not predicted to cause any significant airborne-noise impacts at any NSLU near the project-area thus no mitigation is required.

# APPENDIX B
# Vehicular Classification Counts

# TDSSW, Inc.
# Daily Classes

DailyClass-319 -- English (ENU)

**Datasets:**

| | |
|---|---|
| **Site:** | **[18601] Ribbonwood Road N/O of I-8 W/B Ramps** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 15:58 Monday, December 14, 2009 => 13:09 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860122Dec2009.EC0 (Plus) |
| **Identifier:** | M504J6JA MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **16:00 Monday, December 14, 2009 => 16:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | North (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 258 / 1043 (24.74%) |

## Daily Classes

**DailyClass-319**

| | |
|---|---|
| **Site:** | 18601.0.0SN |
| **Description:** | **Ribbonwood Road N/O of I-8 W/B Ramps** |
| **Filter time:** | **16:00 Monday, December 14, 2009 => 16:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(N) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 31 | 14 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 |
| (%) | 0.0 | 63.3 | 28.6 | 0.0 | 8.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 3 | 74 | 44 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 137 |
| (%) | 2.2 | 54.0 | 32.1 | 0.0 | 11.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 1 | 37 | 27 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| (%) | 1.4 | 51.4 | 37.5 | 0.0 | 9.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 74 | 44 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 137 |
| (%) | 2.2 | 54.0 | 32.1 | 0.0 | 11.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-318 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18601] Ribbonwood Road N/O of I-8 W/B Ramps** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 15:58 Monday, December 14, 2009 => 13:09 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860122Dec2009.EC0 (Plus) |
| **Identifier:** | M504J6JA MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **16:00 Monday, December 14, 2009 => 16:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | South (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 264 / 1043 (25.31%) |

## Daily Classes

**DailyClass-318**

| | |
|---|---|
| **Site:** | 18601.0.0SN |
| **Description:** | **Ribbonwood Road N/O of I-8 W/B Ramps** |
| **Filter time:** | **16:00 Monday, December 14, 2009 => 16:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(S) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 1 | 13 | 5 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| (%) | 4.5 | 59.1 | 22.7 | 0.0 | 4.5 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 4 | 72 | 41 | 0 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |
| (%) | 3.0 | 54.1 | 30.8 | 0.0 | 9.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 2 | 61 | 31 | 0 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 109 |
| (%) | 1.8 | 56.0 | 28.4 | 0.0 | 11.9 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 72 | 41 | 0 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |
| (%) | 3.0 | 54.1 | 30.8 | 0.0 | 9.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-320 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18602] Ribbonwood Road Btwn I-8 E/B Ramps & Old hwy 80** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:08 Monday, December 14, 2009 => 13:20 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860222Dec2009.EC0 (Plus) |
| **Identifier:** | M278T7ZB MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | North (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 1127 / 4671 (24.13%) |

## Daily Classes

**DailyClass-320**

| | |
|---|---|
| **Site:** | 18602.0.0SN |
| **Description:** | **Ribbonwood Road Btwn I-8 E/B Ramps & Old hwy 80** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(N) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 39 | 25 | 0 | 11 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 81 |
| (%) | 0.0 | 48.1 | 30.9 | 0.0 | 13.5 | 0.0 | 0.0 | 1.2 | 6.2 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 2 | 328 | 163 | 0 | 82 | 6 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 590 |
| (%) | 0.3 | 55.6 | 27.6 | 0.0 | 13.9 | 1.0 | 0.0 | 0.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 6 | 240 | 131 | 0 | 72 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 456 |
| (%) | 1.3 | 52.6 | 28.7 | 0.0 | 15.8 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 328 | 163 | 0 | 82 | 6 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 590 |
| (%) | 0.3 | 55.6 | 27.6 | 0.0 | 13.9 | 1.0 | 0.0 | 0.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-321 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18602] Ribbonwood Road Btwn I-8 E/B Ramps & Old hwy 80** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:08 Monday, December 14, 2009 => 13:20 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860222Dec2009.EC0 (Plus) |
| **Identifier:** | M278T7ZB MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | South (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 1211 / 4671 (25.93%) |

## Daily Classes

**DailyClass-321**

| | |
|---|---|
| **Site:** | 18602.0.0SN |
| **Description:** | **Ribbonwood Road Btwn I-8 E/B Ramps & Old hwy 80** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(S) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 101 | 29 | 0 | 14 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 149 |
| (%) | 0.0 | 67.8 | 19.5 | 0.0 | 9.4 | 0.0 | 0.0 | 1.3 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 8 | 364 | 168 | 1 | 78 | 8 | 0 | 3 | 11 | 0 | 0 | 0 | 0 | 641 |
| (%) | 1.2 | 56.8 | 26.2 | 0.2 | 12.2 | 1.2 | 0.0 | 0.5 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 4 | 225 | 123 | 0 | 61 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 421 |
| (%) | 1.0 | 53.4 | 29.2 | 0.0 | 14.5 | 0.0 | 0.0 | 0.0 | 1.7 | 0.2 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 | 364 | 168 | 1 | 78 | 8 | 0 | 3 | 11 | 0 | 0 | 0 | 0 | 641 |
| (%) | 1.2 | 56.8 | 26.2 | 0.2 | 12.2 | 1.2 | 0.0 | 0.5 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-323 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18603] Old Hwy 80 Btwn Ribbonwood Road & Mc Cain Valley Road** |
| **Direction:** | 8 - East bound A>B, West bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:36 Monday, December 14, 2009 => 13:04 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860322Dec2009.EC0 (Plus) |
| **Identifier:** | M264XG37 MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | East (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 983 / 3954 (24.86%) |

## Daily Classes

**DailyClass-323**

| | |
|---|---|
| **Site:** | 18603.0.0EW |
| **Description:** | **Old Hwy 80 Btwn Ribbonwood Road & Mc Cain Valley Road** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(E) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 81 | 31 | 0 | 15 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 |
| (%) | 0.0 | 60.9 | 23.3 | 0.0 | 11.3 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 2 | 252 | 153 | 1 | 86 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 499 |
| (%) | 0.4 | 50.5 | 30.7 | 0.2 | 17.2 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 6 | 156 | 114 | 0 | 73 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 351 |
| (%) | 1.7 | 44.4 | 32.5 | 0.0 | 20.8 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 252 | 153 | 1 | 86 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 499 |
| (%) | 0.4 | 50.5 | 30.7 | 0.2 | 17.2 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-324 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18603] Old Hwy 80 Btwn Ribbonwood Road & Mc Cain Valley Road** |
| **Direction:** | 8 - East bound A>B, West bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:36 Monday, December 14, 2009 => 13:04 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860322Dec2009.EC0 (Plus) |
| **Identifier:** | M264XG37 MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | West (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 975 / 3954 (24.66%) |

## Daily Classes

**DailyClass-324**

| | |
|---|---|
| **Site:** | 18603.0.0EW |
| **Description:** | **Old Hwy 80 Btwn Ribbonwood Road & Mc Cain Valley Road** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(W) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 53 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 |
| (%) | 0.0 | 70.7 | 14.7 | 0.0 | 14.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 2 | 282 | 139 | 0 | 63 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 490 |
| (%) | 0.4 | 57.6 | 28.4 | 0.0 | 12.9 | 0.6 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 3 | 237 | 110 | 0 | 59 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 410 |
| (%) | 0.7 | 57.8 | 26.8 | 0.0 | 14.4 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 282 | 139 | 0 | 63 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 490 |
| (%) | 0.4 | 57.6 | 28.4 | 0.0 | 12.9 | 0.6 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

**DailyClass-326 -- English (ENU)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[18604] Mc Cain Valley Road N/O Old Hwy 80** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:23 Monday, December 14, 2009 => 13:13 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860422Dec2009.EC0 (Plus) |
| **Identifier:** | M508KRAN MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | North (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 124 / 499 (24.85%) |

## Daily Classes

**DailyClass-326**

| | |
|---|---|
| **Site:** | 18604.0.0SN |
| **Description:** | **Mc Cain Valley Road N/O Old Hwy 80** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(N) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 5 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| (%) | 0.0 | 55.6 | 11.1 | 0.0 | 33.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 0 | 21 | 16 | 1 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| (%) | 0.0 | 38.2 | 29.1 | 1.8 | 30.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 0 | 17 | 24 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| (%) | 0.0 | 28.3 | 40.0 | 0.0 | 31.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 21 | 16 | 1 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| (%) | 0.0 | 38.2 | 29.1 | 1.8 | 30.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# TDSSW, Inc.
# Daily Classes

DailyClass-327 -- English (ENU)

**Datasets:**

| | |
|---|---|
| **Site:** | **[18604] Mc Cain Valley Road N/O Old Hwy 80** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 16:23 Monday, December 14, 2009 => 13:13 Tuesday, December 22, 2009 |
| **Zone:** | North America |
| **File:** | 1860422Dec2009.EC0 (Plus) |
| **Identifier:** | M508KRAN MC56-6 [MC55] (c)Microcom 02/03/01 |
| **Algorithm:** | Factory default (v3.21 - 15275) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 |
| **Speed range:** | 0 - 100 mph. |
| **Direction:** | South (bound) |
| **Separation:** | All - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Units:** | Non metric (ft, mi, ft/s, mph, lb, ton) |
| **In profile:** | Vehicles = 119 / 499 (23.85%) |

## Daily Classes

**DailyClass-327**

| | |
|---|---|
| **Site:** | 18604.0.0SN |
| **Description:** | **Mc Cain Valley Road N/O Old Hwy 80** |
| **Filter time:** | **17:00 Monday, December 14, 2009 => 17:00 Wednesday, December 16, 2009** |
| **Scheme:** | Vehicle classification (Scheme F99) |
| **Filter:** | Cls(1 2 3 4 5 6 7 8 9 10 11 12 13 ) Dir(S) Sp(0,100) Headway(>0) |

Monday, December 14, 2009

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mon* | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| (%) | 0.0 | 80.0 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Tue | 0 | 24 | 21 | 0 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| (%) | 0.0 | 42.1 | 36.8 | 0.0 | 19.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Wed* | 0 | 26 | 20 | 0 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| (%) | 0.0 | 45.6 | 35.1 | 0.0 | 17.5 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Thu* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Fri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sat* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sun* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (%) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Average daily volume

Entire week

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 24 | 21 | 0 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| (%) | 0.0 | 42.1 | 36.8 | 0.0 | 19.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |

Weekdays

# APPENDIX C
# Substation Noise Analysis

# SUBSTATION GENERATED AIRBORNE NOISE

## Guidelines for the Determination of Significance

Determination of significance of substation airborne noise at property boundaries was performed in compliance with San Diego County Code of Regulatory Ordinances section 36.404. The portion of the project site under San Diego County land use jurisdiction is zoned as general agriculture, open space and general rural. Significant noise impacts were identified if project implementation would result in noise levels in excess of any of the following:

- 50 dBA Leq during the hours of 7 a.m. to 10 p.m.
- 45 dBA Leq during the hours of 10 p.m. to 7 a.m.

## Potential Operation Noise Impacts (Non-Construction Noise)

There are two collector substation locations proposed on BLM land, the "proposed" collector substation and the "deviant" collector substation. Both substation locations are south of McCain Valley Road, with the deviant substation located 0.6 miles southwest of the proposed substation. The deviant substation location is a potential alternate to the proposed, and as part of the proposed project is not a separate alternative. The alternative substation is located 0.4 miles west of McCain Valley Road, in southern portion of the project area.

Substation noise was modeled for the proposed, deviant and alternate substation locations. The substation equipment includes two (138 kV and 34.5 kV) 100 megavolt ampere power transformers that are connected through 138 kV circuit breakers to a common 138 kV transmission line within the substation.

In the analysis of potential build-out noise conditions HDR modeled noise from two 100 MVA transformers using Cadna-A. Each transformer was modeled assuming a maximum sound power level of 97 dBA, which is conservatively high for a 100 MVA transformer.

**Table 1** presents the results of the proposed substation noise analysis with respect to noise intrusion onto adjacent property lines.

Noise attributable to the proposed substation is below the calculation threshold. Substation noise at property boundaries are approximately 0 dBA, therefore will not increase the cumulative project related noise level.

**Table 2** presents the results of the alternate substation noise analysis with respect to noise intrusion onto adjacent property lines.

**Table 1. Proposed Substation Airborne Noise Analysis**

| Receptor | Distance to Property Line, ft | Noise Level Leq, dBA |
|---|---|---|
| Home_1 | 23,242 | - |
| Home_2 | 26,435 | - |
| Home_27 | 24,825 | - |
| Home_28 | 25,610 | - |
| Home_30 | 24,771 | - |
| Home_31 | 21,835 | - |
| Home_32 | 19,274 | - |
| Home_33 | 27,107 | - |
| Home_34 | 26,974 | - |
| Home_36 | 32,694 | - |
| Home_39 | 27,911 | - |
| Home_42 | 18,212 | - |
| Home_47 | 26,452 | - |

- Below calculation threshold, approximately 0 dB

**Table 2. Alternate Substation Airborne Noise Analysis**

| Receptor | Distance to Property Line, ft | Noise Level Leq, dBA |
|---|---|---|
| Home_1 | 4,486 | 20 |
| Home_27 | 5,928 | 17 |
| Home_28 | 7,633 | 15 |
| Home_30 | 7,331 | 15 |
| Home_31 | 5,969 | 14 |
| Home_32 | 5,015 | 12 |
| Home_33 | 8,316 | 14 |
| Home_34 | 8,859 | 13 |
| Home_36 | 8,598 | 19 |
| Home_39 | 2,376 | 35 |
| Home_42 | 4,445 | 9 |
| Home_47 | Beyond 5 miles from proposed station | |

Noise attributable to the alternate substation varies from 9 dBA to 35 dBA Leq(h). Substation noise at the nearest property boundary is approximately 35 dBA, ten decibels below the county nighttime sound level limits.

Both the proposed substation and alternate substation are predicted to comply with San Diego County noise ordinance requirements at adjacent property boundaries. Maximum calculated noise levels at nearby property boundaries are 10 to 45 dB below the San Diego County nighttime sound level limits.

## Design Considerations and Mitigation Measures

Project-related substation noise is not predicted to cause any significant airborne-noise impacts at any NSLU near the project-area thus no mitigation is required.

# APPENDIX D
# Tule Construction Noise Analysis

Construction noise was re-evaluated for all construction conditions; Roadway Construction, Underground Utilities Construction and Tower Base Construction. Additional scenarios were added to the construction noise analysis and included High Voltage Line (HVTL) Construction activities and the operation of a cement batch plant which would service all modes of construction throughout the project area. In the case of the cement batch plant, it was assumed that the plant's utilization would be 100 percent, or fully operational during an 8-hour work cycle.

All conditions were re-analyzed with distances corresponding to the plat lines as supplied to HDR, and not the residential location as was performed in the original analysis. **Table 1** below, summarizes all construction conditions and the operation of the cement batch plant.

**Table 1. Noise Level Results for Construction and Batch Plant Operation**

| Receptors | | Noise Level Results per Condition | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Roadway Construction | | Underground Utilities Construction | | Tower Base Construction | | HVTL Construction (Including Alternatives) | | Batch Plant Operation | |
| Receptor Name | Homes Represented | Distance to Buffer (feet) | Level (Laeq) | Distance to Buffer (feet) | Level (Laeq) | Distance to Buffer (feet) | Level (Laeq) | Distance to Buffer (feet) | Level (Laeq) | Distance to Buffer (feet) | Level (Laeq) |
| Receptors 1A | Home 1 | 387 | 67 | 4659 | 44 | 4511 | 46 | 1001 | 60 | 3379 | 46 |
| Receptors 2A | Home 2 | 13 | **97** | 820 | 59 | 623 | 63 | 30 | **90** | 525 | 63 |
| Receptors 3A | Home 3-26 (23) | 13 | **97** | 820 | 59 | 623 | 63 | 30 | **90** | 492 | 63 |
| Receptors 4A | Home 27 | 13 | **97** | 6529 | 41 | 8038 | 41 | 1165 | 58 | 5840 | 42 |
| Receptors 5A | Homes 28-29 (2) | 180 | 74 | 7546 | 39 | 8202 | 41 | 49 | **86** | 6962 | 40 |
| Receptors 6A | Home 30 | 164 | **75** | 7218 | 40 | 7710 | 41 | 49 | **86** | 6693 | 41 |
| Receptors 7A | Home 31 | 387 | 67 | 7218 | 40 | 7218 | 42 | 49 | **86** | 6562 | 41 |
| Receptors 8A | Home 32 | 5315 | 45 | 5348 | 42 | 5151 | 45 | 4593 | 46 | 7546 | 39 |
| Receptors 9A | Home 42 | 4511 | 46 | 4265 | 44 | 4265 | 46 | 4101 | 47 | 8202 | 39 |
| Receptors 10A | Homes 33 and 44 (2) | 82 | **81** | 8858 | 38 | 9186 | 40 | 459 | 66 | 8038 | 39 |
| Receptors 11A | Homes 34,35 and 43 (3) | 10 | **99** | 9186 | 38 | 9514 | 39 | 49 | 59 | 8202 | 39 |
| Receptors 12A | Home 36 | 2657 | 51 | 2822 | 48 | 8366 | 40 | 2477 | 52 | 8038 | 39 |
| Receptors 13A | Homes 37-41 (4) | 39370 | 27 | 4429 | 44 | 3937 | 47 | 49 | **86** | 3773 | 45 |
| Receptors 14A | Home 47 | 2543 | 51 | 2133 | 50 | 2297 | 52 | 26247 | 31 | 49213 | 23 |
| **Total Impacted Homes per Condition** | | **31** | | **0** | | **0** | | **32** | | **0** | |

**Note:** Bold and shaded cells denote a noise impact

Because some homes shared parcels, homes were grouped into receptor locations. Noise impacts can be found within the Roadway Construction Condition as well as that for the HVTL Construction Condition. The HVTL Construction Condition incorporates all alternatives as each receptor was modeled nearest to its corresponding alternative, thereby deriving worse case impacts offered in each alternative. Mitigation of noise impacts associated with each condition is discussed below.

The Underground Utilities Condition, the Tower Base Construction Condition and the Batch Plant Operation Conditions exhibit no noise impacts at any receptor or home.

HDR also modeled receptors south of I-8 as requested by the County. At this time it is unclear which parcels have residential units residing on them (aerials do not include enough detail). With this in mind, all parcels were given a receptor number and modeled according to distance from the edge of the parcel closest to the construction buffer, and to the center of the construction buffer. **Table 2** below, details noise levels associated with the HVTL line at all parcels south of I-8.

**Table 2. Noise Level Results for Parcels South of I-8**

| Receptors South of I-8 | | |
|---|---|---|
| | HVTL Construction | |
| Receptor Name | Distance to Construction Area (feet) | Level (Laeq) |
| Receptor 1B | 49 | 85 |
| Receptor 2B | 49 | 85 |
| Receptor 3B | 49 | 85 |
| Receptor 4B | 49 | 85 |
| Receptor 5B | 82 | 81 |
| Receptor 6B | 82 | 81 |
| Receptor 7B | 82 | 81 |
| Receptor 8B | 82 | 81 |
| Receptor 9B | 82 | 81 |
| Receptor 10B | 105 | 78 |
| Receptor 11B | 105 | 78 |
| Receptor 12B | 98 | 79 |
| Receptor 13B | 98 | 79 |
| Receptor 14B | 98 | 79 |
| Receptor 15B | 98 | 79 |
| Receptor 16B | 49 | 85 |
| Receptor 17B | 49 | 85 |
| Receptor 18B | 49 | 85 |
| Receptor 19B | 98 | 79 |
| Receptor 20B | 98 | 79 |
| Receptor 21B | 49 | 85 |
| Receptor 22B | 49 | 85 |
| Receptor 23B | 49 | 85 |
| Receptor 24B | 82 | 81 |
| Receptor 25B | 82 | 81 |
| Receptor 26B | 98 | 79 |
| Receptor 27B | 98 | 79 |
| Receptor 28B | 115 | 78 |
| Receptor 29B | 98 | 79 |
| Receptor 30B | 98 | 79 |
| Receptor 31B | 115 | 78 |
| Receptor 32B | 98 | 79 |
| Receptor 33B | 115 | 78 |
| Receptor 34B | 66 | 83 |
| Receptor 35B | 66 | 83 |
| Receptor 36B | 66 | 83 |
| Receptor 37B | 82 | 81 |
| Receptor 38B | 82 | 81 |
| Receptor 39B | 49 | 85 |
| Distance Test | 167 | 74 |

Note: Bold and shaded cells denote a noise impact

All receptors (parcels) south of I-8 are within 150' of the construction buffer zone and therefore exhibit a noise impact. A distance test was also modeled to determine at which set-back noise levels would fall below the impact threshold (75dBA). This was determined to be 167' from the centerline of the construction buffer. All of the parcels within this analysis and south of I-8 fall within this distance and therefore all parcels exhibit HVTL construction noise impacts.

**Mitigation of Construction Noise**

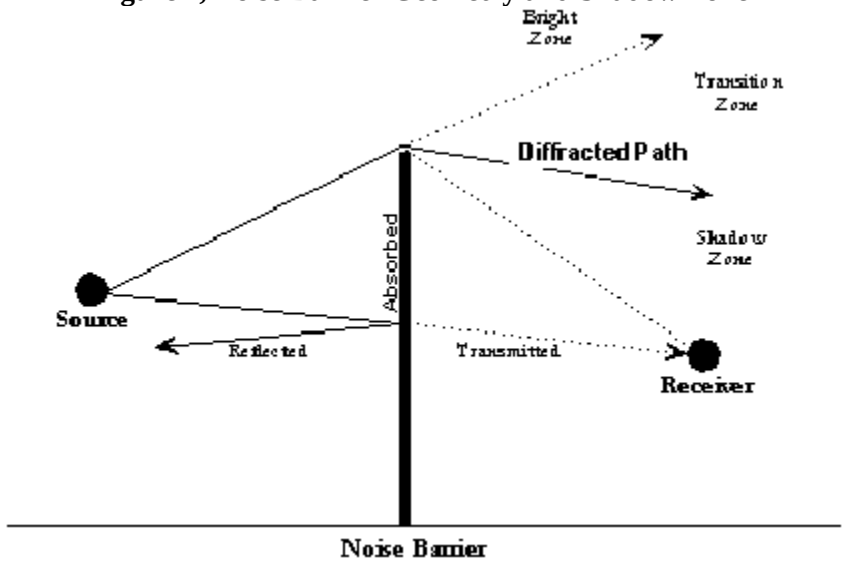
Noise impacts at receptors were realized at receptors closest to Roadway Construction and also to that of HVTL Construction activities.
Mitigation of construction noise can be implemented through a number of different options. The most significant impact during roadway construction is 99dBA Laeq at receptors 11A. Reduction of these high levels to 75 dBA Laeq is most likely going to take the form of a movable barrier, along with modifications to exhaust systems, and time operational time constraints on the noisiest pieces of machinery.

For barriers, the FHWA guidance on barrier design dictates that once line of sight is broken, a reduction of 5-6dB can be achieved. Then, for every foot the barrier proceeds over the noise source, an additional .5dB of reduction can be achieved. However, in order to achieve a considerable decibel reduction a movable noise barrier may have to be unfeasibly high. Considering a 16 foot high exhaust stack on a typical dump truck, achieving a 10dB reduction could mean a barrier as high as 24 feet.

A barrier must also incorporate sufficient mass in order to mitigate noise passing through. While Transmission Loss (TL) has been discussed in the specification of a barrier, TL is not a metric that can be associated with a barrier which is open at the top. A high Sound Transmission Coefficient, or STC, can be specified for both hard and soft flexible barriers which will increase the amount of noise the barrier rejects. It its HDR's recommendation that any barrier specified for the use of shielding residents from noise incorporate and STC rating of no less than 30.

In the projects favor, all properties which show noise exceedances due so because of their close proximity to the construction buffer zone. Noise walls are most effective when the receiver is within the noise walls "shadow zone". The shadow zone is the area immediately on the other side of the noise source. As a receiver moves further from the noise barrier, "diffracted" noise becomes a more significant portion of the noise. Diffraction is the name given to noise which wraps over and around noise walls. Within the noise wall's shadow zone, diffraction is minimized and a noise barrier is at its most effectiveness.

**Figure 1, Noise Barrier Geometry and Shadow Zone**




Source: FHWA, Noise Barrier Design Guidance, "Acoustical Considerations" (http://www.fhwa.dot.gov/environment/noise/design/3.htm)

It is anticipated that a 10dB reduction could be achieved with a 24 foot barrier placed as close as possible to construction activities at the nearest and most impacted receptors. A 10 dB reduction is considered a 50% reduction in noise to the human ear. This alone though, may not reduce the loudest levels to nearby receptors to below San Diego County noise ordinances.

Exhaust silencers used on machinery during construction will mitigate noise further. These are commonplace and affixed aftermarket to most construction machinery. It is difficult within this analysis to quantify reduction for these types of systems however, as no construction or equipment plan is in place at this time. Typical reductions for these types of systems can vary from 5- 7 dB for each type of equipment, resulting in a noticeable reduction of noise to the human ear.

Even with these mitigation measures in place, noise levels from the noisiest below the noise guidelines. Time restrictions as to how many hours a day a particular noisy piece of equipment is used may be imposed to achieve a time weighted reduction of noise reaching residences.

HDR recommends that at utilization of 50% or less (4 hours) for the noisiest pieces of construction equipment be imposed and between the hours of 10AM and 2PM. This will lesson the duration of impact. HDR also recommends all machinery undergo weekly inspections which focus on noise reduction- leaky exhaust systems, loose metal sheeting and poor condition of muffler systems need to be addressed immediately.