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March 12, 2012

VIA HAND DELIVERY & US MAIL

Mr. Eric Solorio, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Pio Pico Energy Center Project (11-AFC-01)
Correspondence to USEPA, Region 9

Dear Mr. Solorio:

On March 7, 2012, Applicant Pio Pico Energy Center, LLC submitted the enclosed correspondence and modeling files to the United States Environmental Protection Agency, Region 9, which provide additional information related to the Applicant's Prevention for Significant Deterioration Permit for the Pio Pico Energy Center Project ("Project"). We enclose for docketing the correspondence and a disc containing the modeling files supporting the Class I Increment Analysis completed for the Project.

Energy Commission General Order 11-GEN ADMIN-01 requires electronic filing and service of documents, but restricts the maximum file size of documents submitted by electronic transfer or email to five megabytes. Because the information containing the modeling files exceeds that threshold, Applicant is submitting to all parties, including the Docket Unit, such files on the enclosed disc. A paper copy of the correspondence is also enclosed.

Respectfully submitted,

Melissa A. Foster

MAF:jmw
Enclosure
cc: Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *PIO PICO ENERGY CENTER, LLC*

Docket No. 11-AFC-1
PROOF OF SERVICE
(Revised 2/21/12)

Pio Pico Energy Center, LLC
Letter to Eric Solorio, California Energy Commission, dated March 12, 2012 Regarding Submittal of Correspondence and Modeling Files to United States Environmental Protection Agency

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DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on March 12, 2012:

☒ I deposited copies of the aforementioned document and, if applicable, a disc containing the aforementioned document in the United States mail at 500 Capitol Mall, Suite 1600, Sacramento, California 95814, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list herein and consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210.

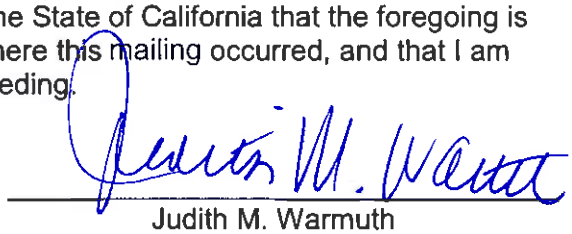
OR

☐ I transmitted the document(s) herein via electronic mail only pursuant to California Energy Commission Standing Order re Proceedings and Confidentiality Applications dated November 30, 2011. All electronic copies were sent to all those identified on the Proof of Service list herein and consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210.

OR

☐ On the date written above, I placed a copy of the attached document(s) in a sealed envelope, with delivery fees paid or provided for, and arranged for it/them to be delivered by messenger that same day to the office of the addressee, as identified on the Proof of Service list herein and consistent with the requirements of California Code of Regulations, Title 20, sections 1209, 1209.5, and 1210.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



Judith M. Warmuth

March 7, 2012

sierra research

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Mr. Gerardo Rios
Chief, Permits Office
U.S. EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: Pio Pico Energy Center PSD Permit Application

Dear Mr. Rios:

As requested by EPA during the February 13, 2012 meeting between representatives of EPA and Pio Pico Energy Center, LLC (Applicant), we are submitting this additional information on behalf of Applicant. EPA also requested that the Applicant provide the modeling files that support the Class I Increment Analysis; those are provided on the enclosed CD.

It should be noted that the Applicant submitted the proposed modeling protocol for the Pio Pico Energy Center (Project) to EPA on December 1, 2010, with a request for review and comment, consistent with EPA's policy encouraging early consultation on modeling issues.[1] EPA did not respond to Applicant's request. In the absence of any questions or concern expressed by EPA regarding the protocol, Applicant proceeded with modeling and analysis consistent with the protocol, and has expended considerable time and effort in reliance on EPA's tacit approval.[2]

It should also be noted that Applicant submitted the PSD permit application on April 1, 2011. The original PSD permit application included an air quality analysis, and the applicant sought guidance from EPA on selection of nearby sources to include in the cumulative impact modeling. The cumulative impact modeling was submitted on July 6, 2011.

[1] Appendix W, Section 10.2.1: "[e]very effort should be made by the Regional Office to meet with all parties involved in a SIP revision or a PSD permit application prior to the start of any work on such a project. During this meeting, a protocol should be established between the preparing and reviewing parties to define the procedures to be followed, the data to be collected, the model to be used, and the analysis of the source and concentration data."

[2] It should also be noted that during the December 9 meeting, EPA staff indicated that any additional concerns regarding modeling issues would be documented in a letter to Applicant on or before December 16, 2011; however, to date, no such letter has been received. In addition, several calls have been placed to EPA modeling staff to confirm that any remaining issues have been resolved, but no calls have been returned. Applicant has therefore proceeded on the assumption that EPA's requests for additional information about modeling issues have been fully addressed.

At the February 13, 2012 meeting, EPA staff asked for more information about modeling parameters. Some of these parameters were first presented to EPA in the July 2011 modeling submittal whereas other parameters were presented to EPA in April 2011as part of the original PSD permit submittal.

Federal regulations require EPA staff to attempt to determine whether a PSD application is complete within 30 days of submittal.[3] While this is not an enforceable requirement, it represents EPA policy at its highest and most public level. EPA's long delays in responding to submittals, the incremental and shifting nature of its requests for additional information (this is EPA's fourth different request for modeling information), and its failure to provide guidance that would allow an applicant to provide a complete and satisfactory response, are not consistent with the spirit represented by this regulation.

SF_6 Emissions

Comment: Please estimate SF_6 emissions from circuit breakers at the project.

Response:
Sulfur hexafluoride (SF6) will be used as an insulating medium in three 230 kV switchyard breakers and in two generator circuit breakers (GCB). Estimates of the SF6 contained in a 230 kV breaker range from 161 to 208 lbs, depending on the manufacturer. The GCBs will each contain 24.2 lb of SF6. The IEC standard for SF6 leakage is less than 0.5%; the NEMA leakage standard for new circuit breakers is 0.1%. A maximum leakage rate of 0.5% per year is assumed.

Type of Breaker	Number of Breakers	lb SF_6 per breaker	Maximum Leakage Rate, %	Maximum SF_6 Emissions, lb/yr
Switchyard	3	208	0.5%	3.12
Generator	2	24.2	0.5%	0.24
Total				3.36

Based on a global warming potential of 23,900[4], the maximum SF_6 emissions from facility circuit breakers will not exceed 40.2 tons/yr of CO_2e.

Wind Roses

[3] 40 CFR 124.3 (c): "The Regional Administrator shall review for completeness every application for an EPA-issued permit. **Each application for an EPA-issued permit submitted by** a new HWM facility, a new UIC injection well, **a major PSD stationary source** or major PSD modification, or an NPDES new source or NPDES new discharger **should be reviewed for completeness by the Regional Administrator within 30 days of its receipt**. Each application for an EPA-issued permit submitted by an existing HWM facility (both Parts A and B of the application), existing injection well or existing NPDES source or sludge-only facility should be reviewed for completeness within 60 days of receipt. Upon completing the review, the Regional Administrator shall notify the applicant in writing whether the application is complete. If the application is incomplete, the Regional Administrator shall list the information necessary to make the application complete." (emphasis added).

[4] 40 CFR 98 Subpart A, Table A-1.

Comment: Please provide new wind rose graphics based on the definition of "calm" periods used in the modeling.

Response: In order to reduce the amount of time where wind speed is treated as "calm," the San Diego Air Pollution Control District (SDAPCD or District) defines wind speeds below 0.45 m/sec as "calm" (standard definition is 0.5 m/sec). Charts were provided in the PSD application that graphically summarize quarterly and annual distributions of wind speed and direction ("wind roses"). The wind roses that were provided in the application used the standard cutoff for calm periods. EPA requested that Applicant provide wind roses that use the same cutoff used by the Applicant, following District guidance, in the modeling; the requested wind roses are attached.

Summary of 1-hour NO_2 NAAQS Compliance Calculation

Comment: Please show the calculations and relevant data used to demonstrate compliance with the 1-hour NO_2 NAAQS.

Response: The requested calculations are presented in Table 1.

Table 1
One-hr NO_2 NAAQS Compliance Calculation
(Receptor 8164[a])

Year	2004	2005	2006	2007	2008	5-year Average
Date	March 7	Oct. 19	Dec. 14	March 23	Oct. 14	
Hour	21	3	18	23	19	
Cumulative Impact (µg/m3)	175.5	170.5	193.9	172.9	184.4	179.4
Regional Background (µg/m3)	125.94	78.95	107.14	101.50	110.90	
Project Impact (µg/m3)	37.36	62.05	67.03	20.01	36.55	

[a] Receptor with the highest 5-year average 98th percentile of the daily maximum 1-hour cumulative impact (monitor data plus modeled impact from project and non-project nearby sources).

Isopleth Maps of 5-Year Averages of 98th Percentile Concentrations

Comment: Please provide isopleths maps showing the 5-year averages of 98th percentile concentrations for both $PM_{2.5}$ and NO_2.

Response: The requested isopleths maps are provided as Figures 1 and 2.

Figure 1. Five-Year Averages of 98th Percentile Maximum Daily One-hour NO_2 Concentrations (Measured Background plus Modeled Project and Nearby Sources)

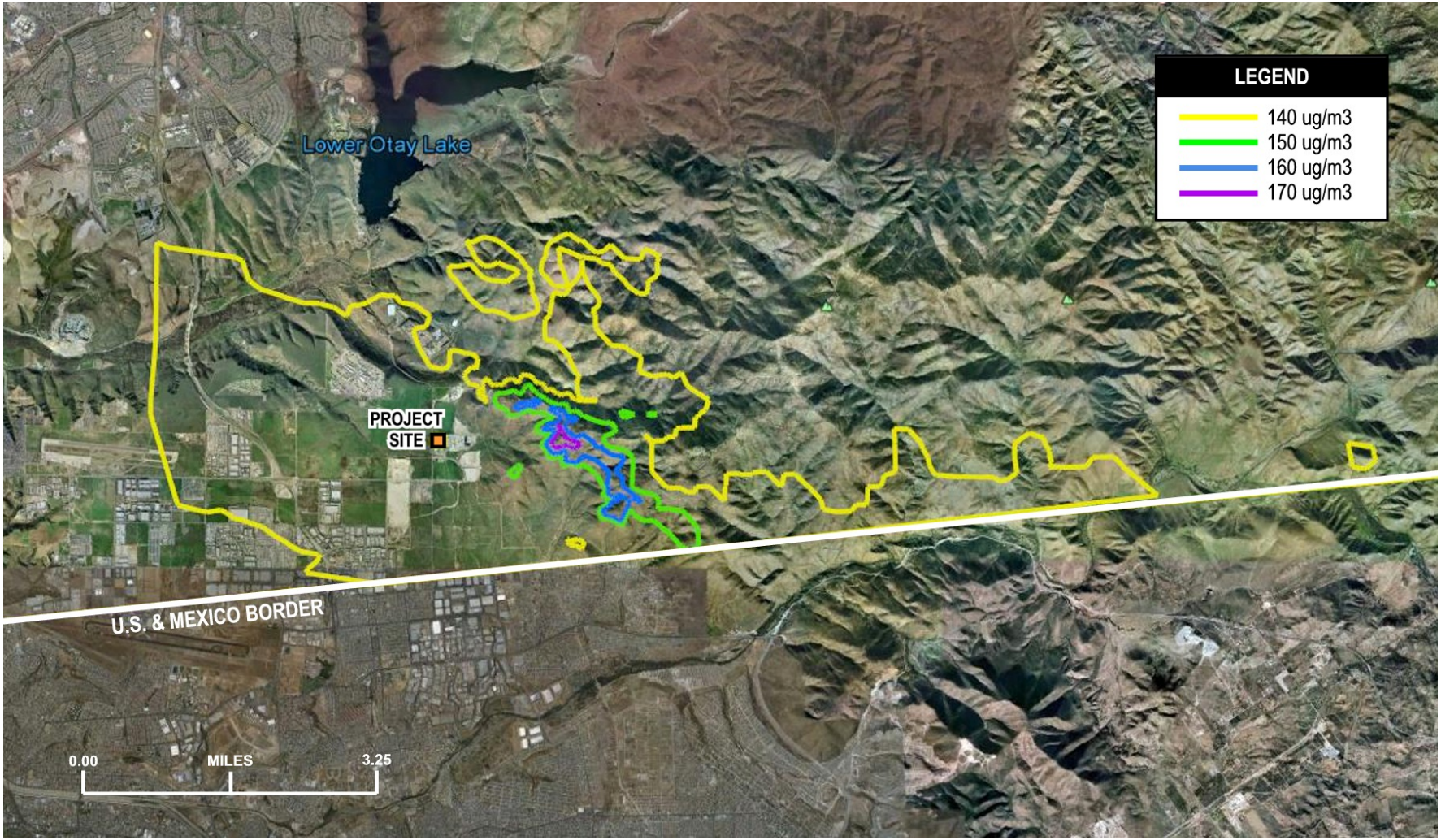
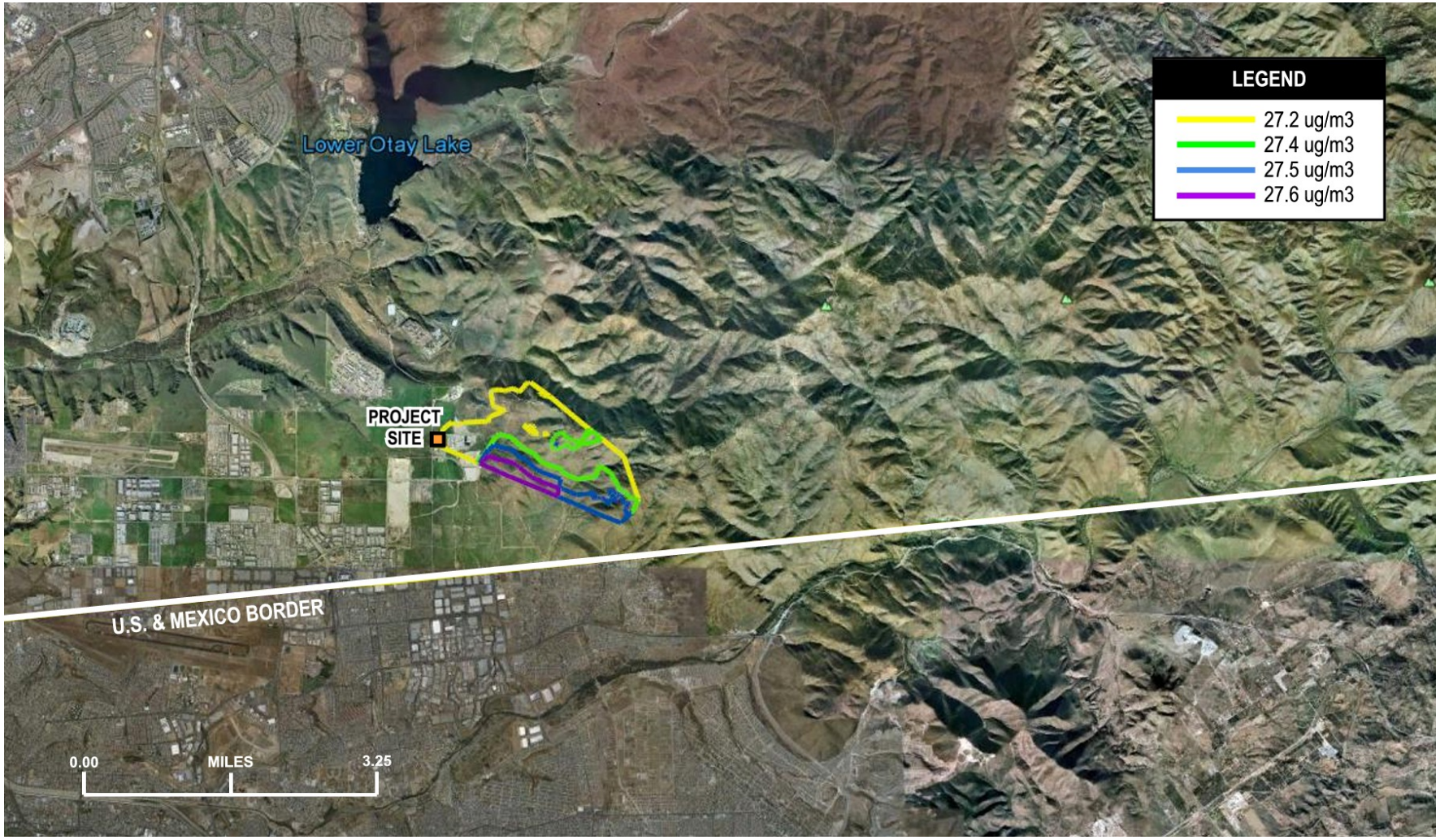


Figure 2. Five-Year Averages of 98th Percentile Maximum 24-hour $PM_{2.5}$ Concentrations (Measured Background plus Modeled Project and Nearby Sources)



Justification of Use of PVMRM

Comment: On December 1, 2011, at EPA's request, the applicant submitted additional justification for the use of the PVMRM Tier 3 non-regulatory default option. EPA specifically requested more information on prongs 1 and 4 of the 5-prong demonstration under Appendix W Section 3.2.2. Now EPA requests more information on prongs 2, 3, and 5.

Section 3.2.2.e of Subpart 51, Appendix W states:

> *e. Finally, for condition (3) in paragraph (b) of this subsection, an alternative refined model may be used provided that:*
>
> > *i. The model has received a scientific peer review;*
> > *ii. The model can be demonstrated to be applicable to the problem on a theoretical basis;*
> > *iii. The data bases which are necessary to perform the analysis are available and adequate;*
> > *iv. Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and*
> > *v. A protocol on methods and procedures to be followed has been established.*

Applicant provided information supporting the use of PVMRM in its initial PSD application submitted in April 2011. At EPA's request, Applicant provided supplemental information on Prongs 1 and 4 in its December 1, 2011 submittal. Additional information is provided below with regard to the other three prongs.

Prong 2. *The model can be demonstrated to be applicable to the problem on a theoretical basis.*

AERMOD without PVMRM (or OLM) is a dispersion model. It predicts ground-level concentrations based on distribution of emissions from the sources being modeled. However, the NOx emitted at the stack is a mixture of (primarily) NO and NO_2. If conversion of stack NO to NO_2 in the atmosphere is not taken into account, the model will significantly underpredict NO_2 impacts. Conversely, if the unrealistic assumption is made that 100% of stack NO is converted to ground-level NO_2 at all receptors, regardless of transport time, transport distance, or ambient ozone concentrations, the dispersion model will significantly overpredict NO_2 impacts. Conservative assumptions are initially used in compliance screening methodologies in order to assure compliance. As the compliance evaluation methodology becomes more sophisticated, the greater accuracy continues to assure compliance while allowing more realistic (less conservative) assumptions. EPA addresses this process, in the context of the 1-hour NO_2 standard, through increasingly sophisticated (and less conservative) tiers of analysis.

The regulatory default modeling methodologies for the 1-hour NO_2 standard are screening methodologies.[5]

> Tier 1: Assume full conversion of NO to NO_2 based on application of an appropriate refined modeling technique under Section 4.2.2 of Appendix W to estimate ambient NOx concentrations.
>
> Tier 2: Multiply Tier 1 result by empirically derived NO_2/NOx ratio, with 0.75 as the annual national default ratio.
>
> Tier 3: Detailed screening methods may be considered on a case-by-case basis, with the Ozone Limiting Method (OLM) identified as a detailed screening technique for point sources. PVMRM is also considered by EPA to be in this category at this time.[6]

Under EPA's interim guidance for evaluating compliance with the 1-hour NO_2 NAAQS, the Significant Impact Level (SIL)-equivalent is so low that almost any moderate-to-large combustion source will have difficulty passing a screening assessment. It is therefore necessary to use more sophisticated analytical tools, as provided for in EPA guidance. One such tool identified by EPA, and selected for use with the Project, is the PVMRM option within AERMOD.

AERMOD-PVMRM has been tested specifically for its ability to compute unbiased results. One of the key studies was conducted by a senior modeler currently in OAQPS at EPA, and conducted on large natural gas-fired power plants.[7] The study concluded the following: "Based on all of the data available, the AERMOD-PVMRM algorithm is judged to provide unbiased estimates of the NO_2 /NOx ratio based on criteria that are comparable to, or more rigorous than, evaluations performed for other dispersion models that are judged to be refined."

In its March 1, 2011 guidance, EPA states:

> "We believe that these additional model evaluation results lend further credence to the use of these Tier 3 options in AERMOD for estimating hourly NO2 concentrations, and we recommend that their use should be generally accepted provided some reasonable demonstration can be made of the appropriateness of the key inputs for these options, the in-stack NO2/NOx ratio and the background ozone concentrations."[8]

For these reasons, use of the AERMOD-PVMRM algorithm is applicable to a refined analysis of compliance with the 1-hour average NO_2 impacts from the Project on a theoretical basis.

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[5] EPA, Appendix W Section 5.2.4. See also Memorandum from Wood to Regional Air Division Directors, *General Guidance for Implementing the 1-hour NO2 Standard in Prevention of Significant Deterioration Permits*, June 28, 2010, p.14.

[6] Memorandum from Wood to Regional Air Division Directors, *Applicability of Appendix W Modeling Guidance for the 1-hour NO2 NAAQS*, June 28, 2010, p.2.

[7] Brode, Roger W. *Final Report, Evaluation of Bias in AERMOD-PVMRM*, MACTEC report on Alaska Department of Environmental Conservation Contract No. 18-9010-12, June 2005.

[8] Memorandum from Fox to Regional Air Division Directors, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 NAAQS*, March 1, 2011, p. 6.

Prong 3. *The data bases which are necessary to perform the analysis are available and adequate.*

The additional data needed to perform the PVMRM analysis (i.e., ambient ozone data) were collected from the Chula Vista monitoring station, which is the same station that provided the ambient NO_2 data.

The justification for use of background air quality data from the Chula Vista monitoring station was presented in the November 2010 modeling protocol at pp. 6-7. As discussed in the monitoring protocol, the Chula Vista monitoring station was selected by the San Diego APCD as the monitoring location most representative of the project site.

The ozone data used in the PVMRM analysis were provided by the District. The hourly ozone data was 6.33% incomplete before data substitution.[9] The data substitution procedure described in the December 1, 2011 submittal was used to fill any gaps.

In-stack NO_2/NO_x ratios for the project turbines are based on source test data from similar units, provided by the District (and described in the January 5, 2012 submittal). In-stack NO_2/NO_x ratios for nearby sources were based on District source test data, provided by the District (and also described in the January 5, 2012 submittal).

Prong 5. *A protocol on methods and procedures to be followed has been established.*

Applicant submitted the proposed modeling protocol for the Pio Pico Energy Center (Project) to EPA on December 1, 2010, with a request for review and comment, consistent with EPA's policy encouraging early consultation on modeling issues. EPA did not respond to Applicant's request. In the absence of any questions or concern expressed by EPA regarding the protocol, Applicant proceeded with modeling and analysis consistent with the protocol, and has expended considerable time and effort in reliance on EPA's tacit approval.

In March 2011, EPA published additional modeling guidance for 1-hour NO_2 compliance demonstrations.[10] The modeling protocol submitted in December 2010 is consistent with that guidance. The AQIA submitted as part of the PSD application is also consistent with that guidance.

EPA did provide some guidance in May 2011 regarding selection of nearby sources for cumulative impact analysis for this project. EPA did not at that time express any concern regarding use of PVMRM for this Project or seek additional justification for such use.

Conclusion

[9] 2004, 529 missing hours out of all 8784 hours / 6.02%;
2005, 549 missing hours out of all 8760 hours / 6.27%;
2006, 483 missing hours out of all 8760 hours / 5.51%;
2007, 634 missing hours out of all 8760 hours / 7.34%;
2008, 571 missing hours out of all 8784 hours / 6.50%;

[10] Memorandum from Fox to Regional Air Division Directors, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 NAAQS*, March 1, 2011.

Based upon the information provided above and in previous submittals to EPA, Applicant believes that the use of PVMRM for the demonstration of compliance with the 1-hour NO_x NAAQS meets the criteria specified in Section 3.2.2.e of Subpart 51, Appendix W.

Surface Roughness

Please provide a more detailed (by sector) comparison of the surface roughness at the project site with the surface roughness at the site providing the meteorological data.

Otay Mesa Meteorological Station

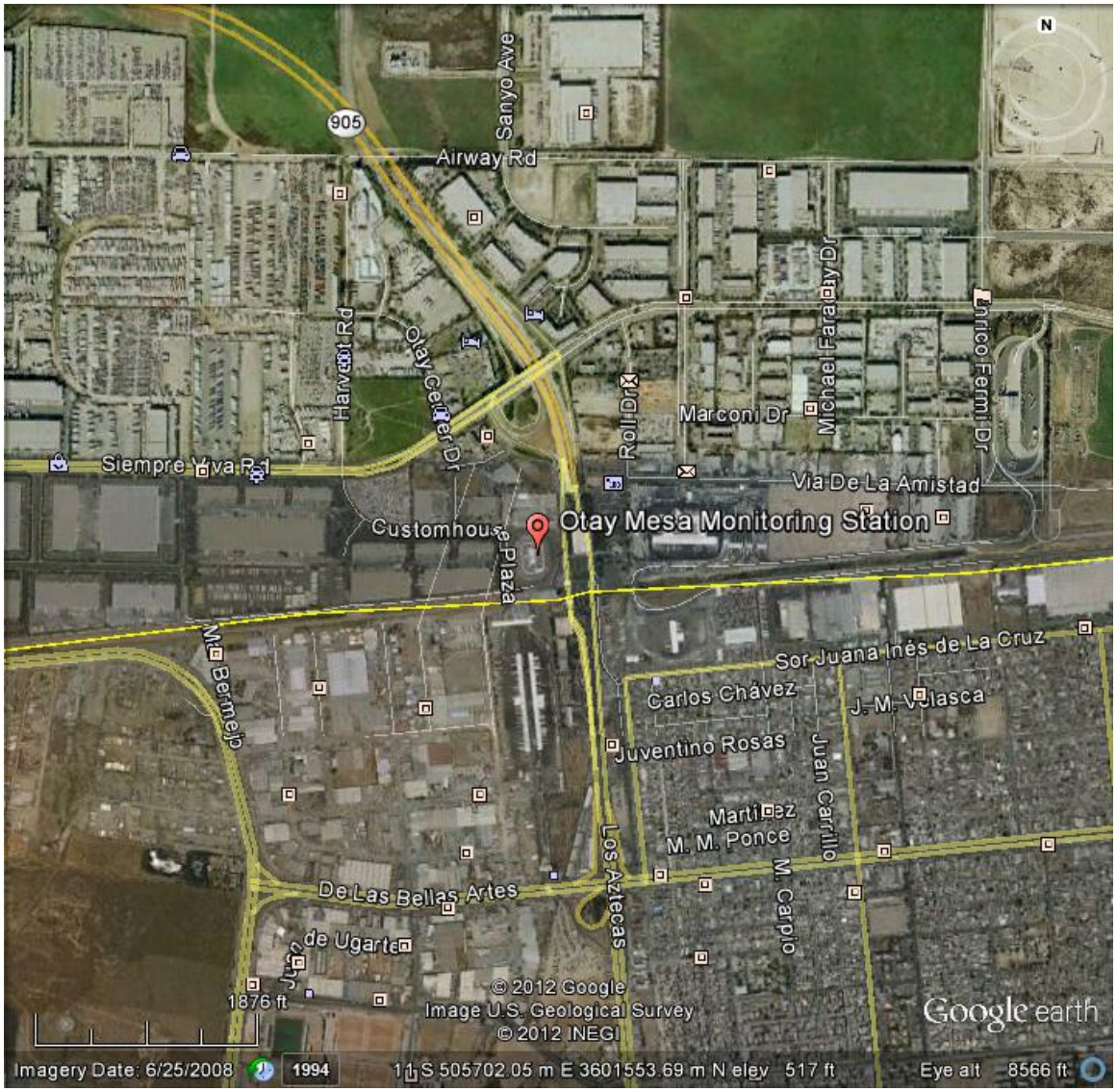
Response: The surface roughness values used in the PPEC PSD permit application were developed by the SDAPCD, and represent the surface roughness surrounding the site where meteorological data were collected. The District followed EPA's "AERMOD Implementation Guide" (2008 version) in using EPA's AERSURFACE processor with the National Land Cover Data 1992 archive to determine surface characteristics for AERMET (Class II Modeling Protocol pp.2-9 to 2-14).

AERSURFACE uses a Land Use data base from 1992, and does not take buildings into account. The District reviewed aerial photos for the area, which show that the vicinity of the Otay Mesa meteorological tower is surrounded by a light industrial and residential area that includes northern Mexico and the U.S border area. Using this information, the District adjusted the surface roughness factor from the value of approximately 0.2 meters calculated by AERSURFACE to 0.7 meters to more accurately represent the current terrain and structures surrounding the Otay Mesa meteorological monitoring station location (see Figure 3). The District's adjustment is supported by AERSURFACE guidance[11] and the scientific literature.[12] EPA's AERSURFACE guidance assigns an even higher surface roughness of 0.8 m to commercial/industrial/transportation areas (Class 23) not located at an airport. Stull's scientific textbook on boundary layer meteorology, which is a scientific reference for Table A-3 in EPA's AERSURFACE User's Guide, gives a surface roughness range of approximately 0.7 m to 1.3 m for "Centers of large towns and cities."

SDAPCD performed a qualitative review of the surface roughness values used by the Applicant (per instructions by the District) to ensure that they were reasonably representative of the project site. It did this by examining the 10 km by 10 km domain centered on the project site, and determined that the data in the two tables are reasonably representative of the domain as a whole. This conclusion is not surprising, because both locations are located within that 10 km by 10 km domain.

[11] EPA. *AERSURFACE User's Guide*, Table A-3 – Seasonal Values of Surface Roughness (m) for the NLCD92 21-Land Cover Classification System, page A-5, January 2008.
[12] Stull, R.B., *An Introduction to Boundary Layer Meteorology*, Figure 9.6 -Aerodynamic roughness lengths for typical terrain types, page 380, 1988.

Figure 3. Otay Mesa Meteorological Station and Surrounding Area



EPA has requested additional detail characterizing the surface roughness surrounding the project site by sector. Applicant has characterized the surface roughness as follows:

- Twelve 30-degree land use sectors
- Annual results by sector
- 1 kilometer radius
- Seasons defined as follows
    - October-February: Late autumn after frost and harvest
    - March-April: Transitional spring (partial green coverage, short annuals)
    - May-September: Midsummer with lush vegetation

The results for the PPEC project site from AERSURFACE, along with the District's revised values for the location of the meteorological monitoring station, are shown in Table 2.

Table 2
Comparison of Surface Roughness at PPEC Stack Location with Otay Mesa Meteorological Station (meters)

Sector	PPEC	Otay Mesa Met Station (adjusted by SDAPCD)
1	0.2	0.7
2	0.2	0.7
3	0.2	0.7
4	0.2	0.7
5	0.2	0.7
6	0.2	0.7
7	0.1	0.7
8	0.2	0.7
9	0.2	0.7
10	0.1	0.7
11	0.2	0.7
12	0.2	0.7

In contrast to the area surrounding the Otay Mesa meteorological station, the area surrounding the project site is not surrounded by buildings. However, there are significant structures adjacent to the project site, including the combustion gas turbines, heat recovery steam generators, dry cooling tower and administration building for the Otay Mesa Energy Center located directly east of the Project at distances between 0.1 and 0.6 km.

The information provided in the Applicant's December 1, 2011 letter demonstrates that the albedo and Bowen ratio values for the project and meteorological station sites are very similar.

The importance of surface roughness in the AERMOD dispersion model is to properly interpret the meteorological observations at the monitoring site. The surface roughness *around the meteorological station is used*,[13] along with monitored wind speeds, directions, and temperatures by AERMOD's meteorological processor, AERMET, "in determining the magnitude of mechanical turbulence and the stability of the boundary layer"[14] being monitored. It is only after the monitored meteorological data have been properly interpreted that the data can be used by AERMOD to correctly simulate air dispersion from various project sites within reasonable proximity to the meteorological monitoring stations.

[13] EPA. *AERSURFACE User's Guide*, page 6, January 2008.
[14] EPA. *AERSURFACE User's Guide*, page 1, January 2008.

Surface roughness is therefore used by AERMOD to properly interpret airflow measurements at the monitoring site and apply them to the dispersion calculations.

Assessment of the representativeness of the Otay Mesa meteorological data

EPA guidance describes the factors that should be taken into account in assessing siting of meteorological monitors.[15] Although this guidance is principally useful in determining where to site a new monitor, it is also helpful in assessing the adequacy of existing data.

The factors recommended for consideration in monitor siting are:

- Proximity
- Height of Measurement
- Boundary Layer Profile Considerations
- Surface Characteristics

The goal of the analysis is to determine whether the proposed monitoring data is adequately representative of the area of interest.[16] Because the preferred regulatory dispersion model (AERMOD) is a steady state model, one set of meteorological conditions must be selected to represent the entire modeling domain. The determination of whether data are adequate for this purpose is a qualitative evaluation that requires the application of experience and judgment.

Factor 1: Proximity.

> "In general, the representativeness of the meteorological data used in an air quality modeling analysis is dependent on the proximity of the meteorological monitoring site to the "area-of-interest".[17]
>
> "In some instances, even though meteorological data are acquired at the location of the pollutant source, they may not correctly characterize the important atmospheric dispersion conditions; e.g., dispersion conditions affecting sources located on the coast are strongly affected by off-shore air/sea boundary conditions - data collected at the source would not always reflect these conditions."[18]

The Otay Mesa meteorological station is very close to the project site—3.2 km. Both the site and the station are approximately the same distance from the Pacific Ocean, and there are no significant nearby bodies of water to affect dispersion conditions at either site. There are no intervening terrain features between the project site and the meteorological station. The principal factor for assessing representativeness of the meteorological data, proximity, therefore weighs strongly in favor of the Otay Mesa data.

Factor 2: Height of Measurement.

[15] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-1
[16] This is not the same as the project site. See the discussion of Factor 1 (Proximity) below.
[17] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-3
[18] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-3

> "Representativeness is a function of the height of the measurement. For example, one can expect more site-to-site variability in measurements taken close to the surface compared to measurements taken aloft. As a consequence, upper-air measurements are generally representative of much larger spatial domains then are surface measurements."[19]

Measurements at the Otay Mesa meteorological station are made at a height of 10 m, which is the standard measurement height for a permanent NWS station of the type routinely accepted by EPA. This factor supports the use of the Otay Mesa data.

Factor 3: Boundary Layer Profile Considerations.

> "Where appropriate, data representativeness should be viewed in terms of the appropriateness of the data for constructing realistic boundary layer profiles and three dimensional meteorological fields. Factors that should be considered in selecting a monitoring site in complex terrain include: the aspect ratio and slope of the terrain, the ratios of terrain height to stack height and plume height, the distance of the source from the terrain feature, and the effects of terrain features on meteorological conditions, especially wind speed and wind direction."[20]

Factor 3A: Aspect ratio and slope of the terrain.

The aspect ratio and slope of the terrain surrounding the meteorological station is flat, sloping slightly upwards to the east. The aspect ratio and slope of terrain to the south and west of the project site is the same as for the meteorological station. However, the terrain rises to the north and east of the project site. As a result, wind speed and direction data taken at the project site would be, to some extent, affected by the terrain. Meteorological data taken at the site would be expected to be less representative of the area of interest than data collected at the Otay Mesa station, which is less affected by the terrain. This factor supports the use of the Otay Mesa data.

Factor 3B: Ratios of terrain height to stack height and plume height

The terrain to the east of the project site rises to more than a hundred meters above the stack within two kilometers. However, the plume height is above the terrain height, so this subfactor is not a significant factor in assessing meteorological monitor location.

Factor 3C: Distance of the source from the terrain feature

The nearest terrain feature that could affect meteorological conditions is the elevated terrain of the San Ysidro Mountains to the east of both the project site and the meteorological station. The project site is approximately 1.5 km from the nearest ridge. The meteorological station is approximately 4.5 km from the same ridge, which is the closest terrain feature to the meteorological station. This factor supports the use of the Otay Mesa data.

[19] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-3
[20] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-3

Factor 3D: Effects of terrain features on meteorological conditions, especially wind speed and wind direction.

The most important consideration in siting a wind direction sensor in complex terrain is that the measured direction should not be biased in a particular direction that is not experienced by the pollutant plume.

The same large-scale topographic features located to the east and north that influence the meteorological data monitoring station also influence the proposed project site in the same manner. This factor supports the use of the Otay Mesa data.

Factor 4: Surface Characteristics

> "In steady-state modeling applications, one typically focuses on the meteorological conditions at the release height of the source or sources, or the plume height in the case of buoyant sources. Representativeness for steady-state modeling applications must necessarily be assessed in concert with the steady-state assumption that meteorological conditions are constant within the space-time domain of the application; as typically applied, measurements for a single location, somewhere near the source, are assumed to apply, without change, at all points in the modeling domain. Consistency would call for site selection criteria consistent with the steady state assumption; i.e., to the extent possible, sites should perhaps be selected such that factors which cause spatial variations in meteorological conditions, are invariant over the spatial domain of the application, whatever that might be. Such factors would include surface characteristics such as ground cover, surface roughness, the presence or absence of water bodies, etc. Similarly, the representativeness of existing third-party data bases should be judged, in part, by comparing the surface characteristics in the vicinity of the meteorological monitoring site with the surface characteristics that generally describe the analysis domain."[21]

The presence of buildings surrounding the Otay Mesa station would affect the data (the increased surface roughness of the urban setting would be expected to reduce windspeeds). AERMOD takes this effect into account by adjusting for surface roughness at the monitoring site. When the analysis domain is viewed as a whole, this factor supports the use of the Otay Mesa data.

Conclusion

The single most important factor in determining representativeness, proximity to the source, strongly supports a determination that the Otay Mesa meteorological data are representative. Other factors that support this determination are the similar distances to major terrain features, including the nearby mountains and the ocean.

In conclusion, the Applicant believes that the use of five years of meteorological data from the Otay Mesa station is fully consistent with EPA guidance, is fully consistent with EPA past practice, and is adequately representative of the Project area.

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[21] EPA, *Meteorological Monitoring Guidance for Regulatory Modeling Applications.* p. 3-2

If you have any questions regarding this information, please contact the Applicant's representative David Jenkins at (317) 431-1004, or Gary Rubenstein or me at (916) 444-6666.

Sincerely,

Steve Hill

cc: John McKinsey, Stoel Rives LLP
David Jenkins, Apex Power Group
Steve Moore, San Diego Air Pollution Control District

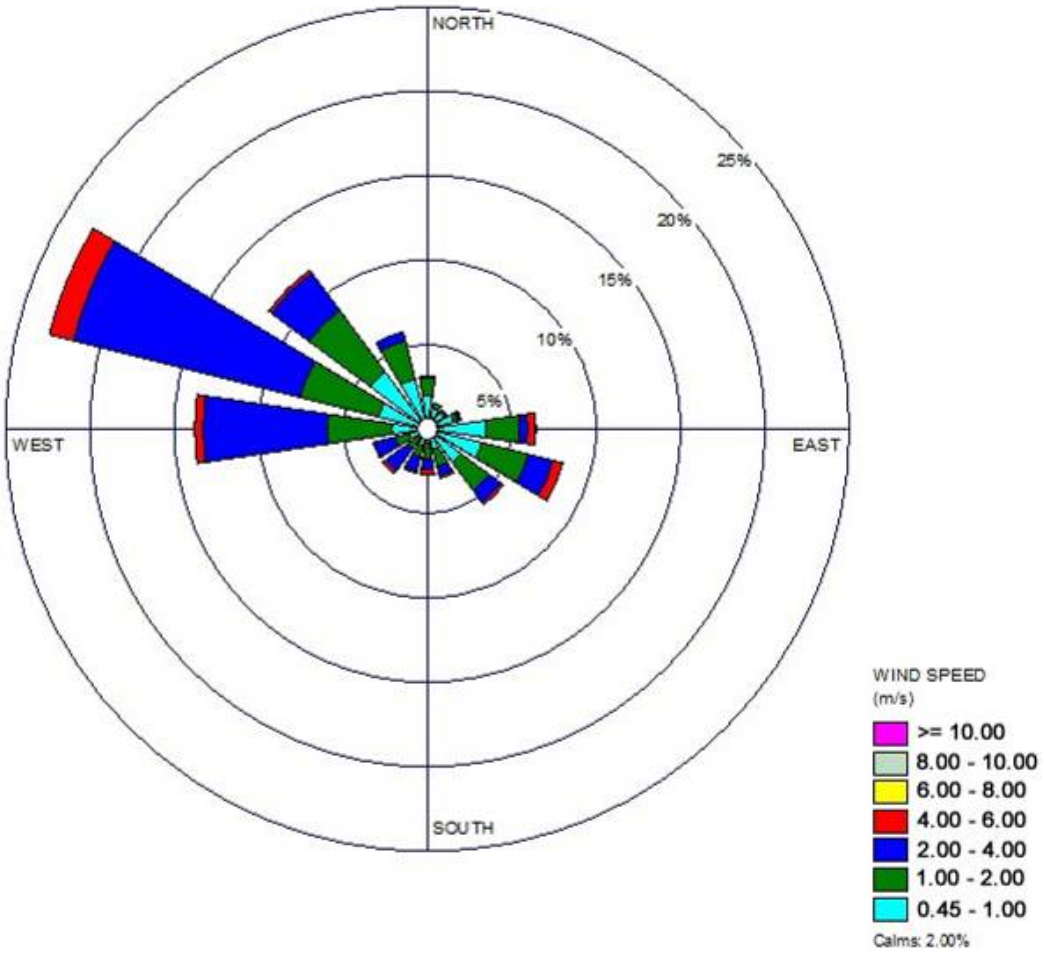
Attachments

Enclosure: CD

Otay Mesa – Annual, 2004

WIND ROSE PLOT:
OtayMesa, Annual, 2004

DISPLAY:
Wind Speed
Direction (blowing from)



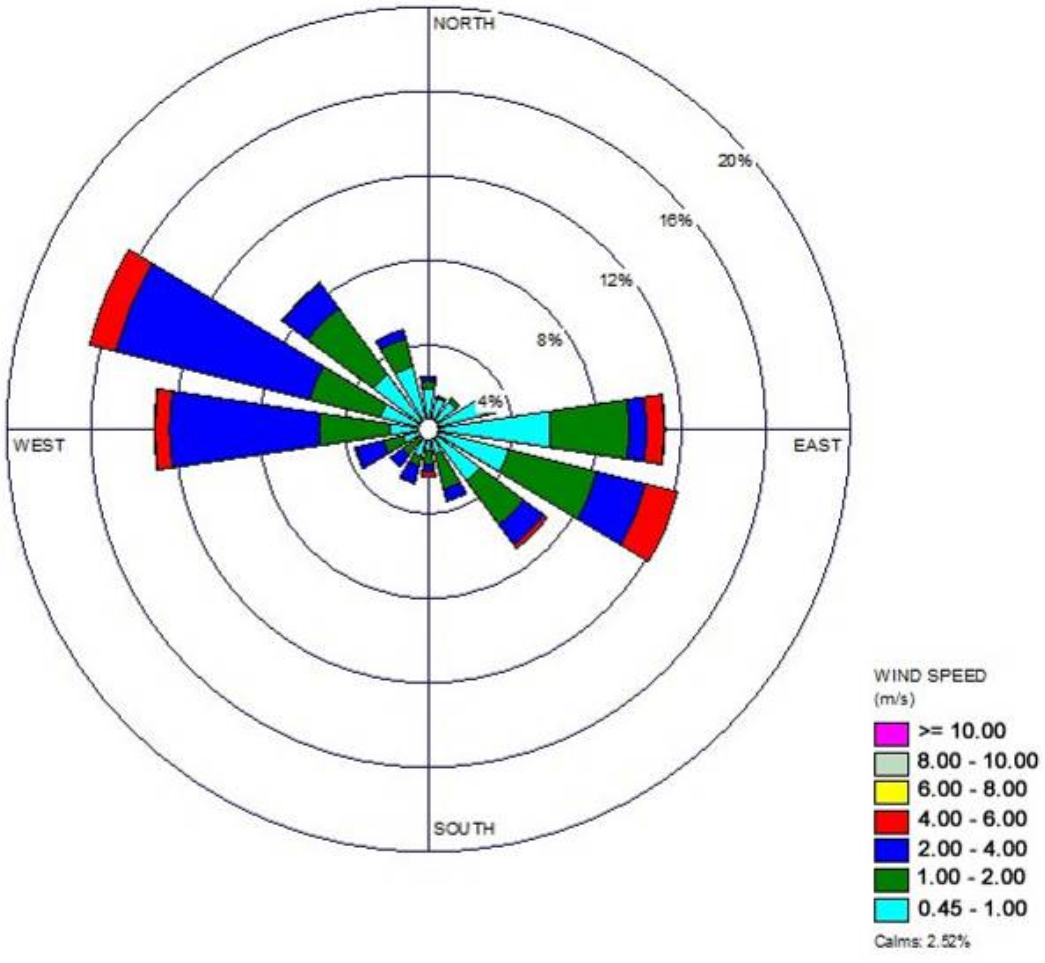
COMMENTS:	DATA PERIOD: **Start Date: 1/1/2004 - 00:00** **End Date: 12/31/2004 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **2.00%**	TOTAL COUNT: **8779 hrs.**	
	AVG. WIND SPEED: **1.79 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 1st Quarter, 2004

WIND ROSE PLOT:
OtayMesa, 1st Quarter, 2004

DISPLAY:
Wind Speed
Direction (blowing from)



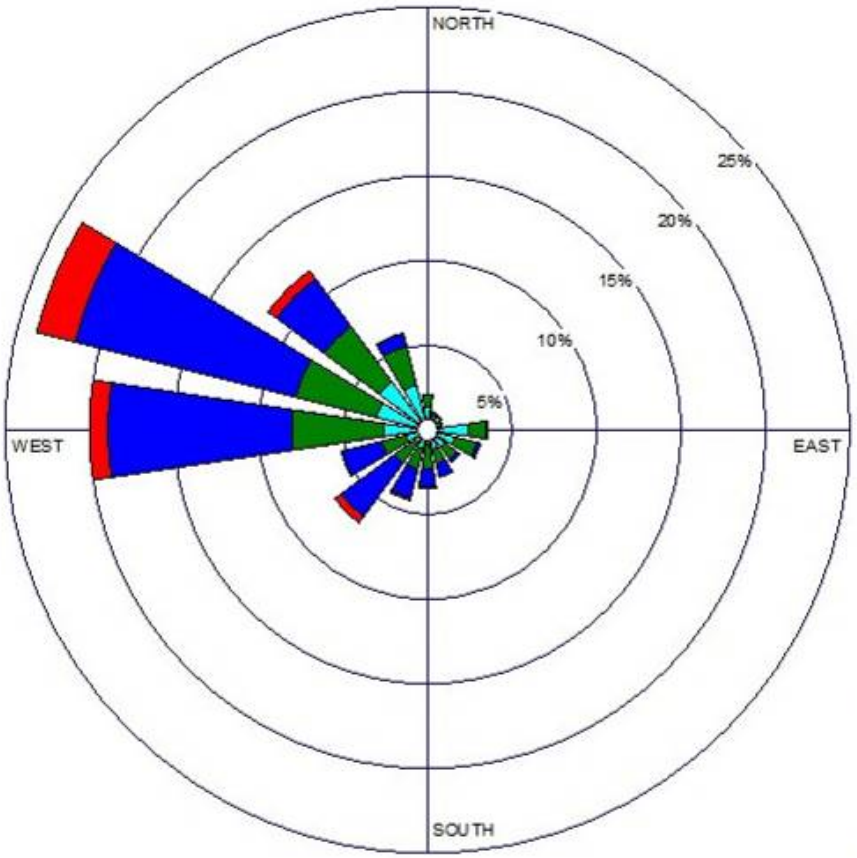
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2004 - 00:00 **End Date: 3/31/2004 - 23:00**	MODELER:	
	CALM WINDS: **2.52%**	TOTAL COUNT: **2179 hrs.**	
	AVG. WIND SPEED: **1.69 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 2nd Quarter, 2004

WIND ROSE PLOT:
OtayMesa, 2nd Quarter, 2004

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 1.46%

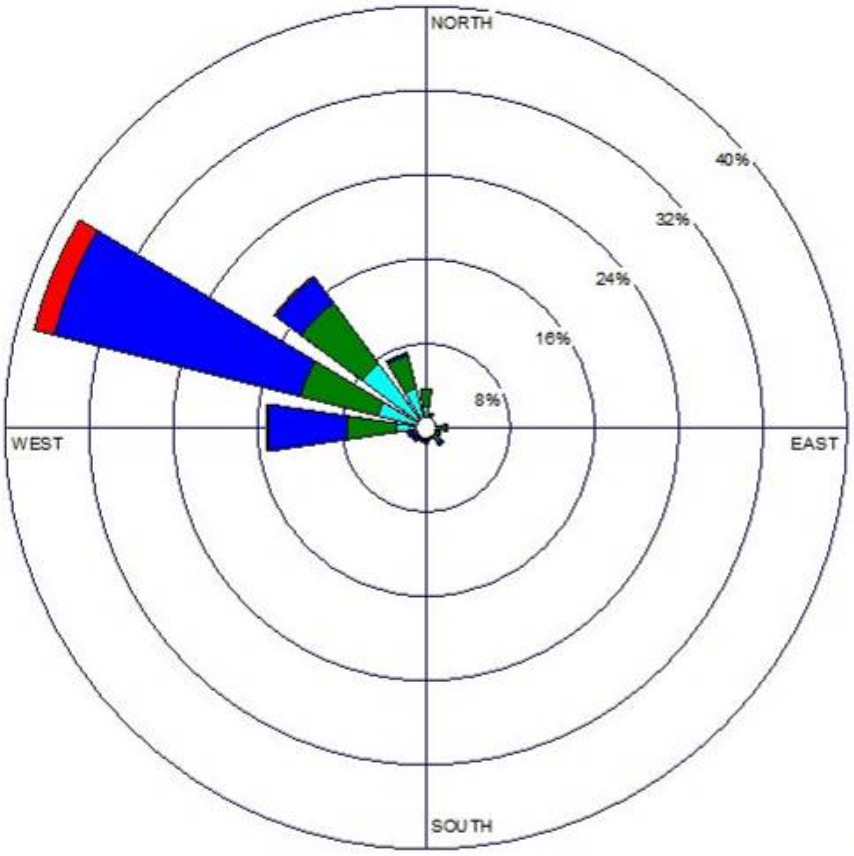
COMMENTS:	DATA PERIOD: **Start Date: 4/1/2004 - 00:00** **End Date: 6/30/2004 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **1.46%**	TOTAL COUNT: **2184 hrs.**	
	AVG. WIND SPEED: **1.94 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 3rd Quarter, 2004

WIND ROSE PLOT:
OtayMesa, 3rd Quarter, 2004

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
>= 10.00
8.00 - 10.00
6.00 - 8.00
4.00 - 6.00
2.00 - 4.00
1.00 - 2.00
0.45 - 1.00
Calms: 1.63%

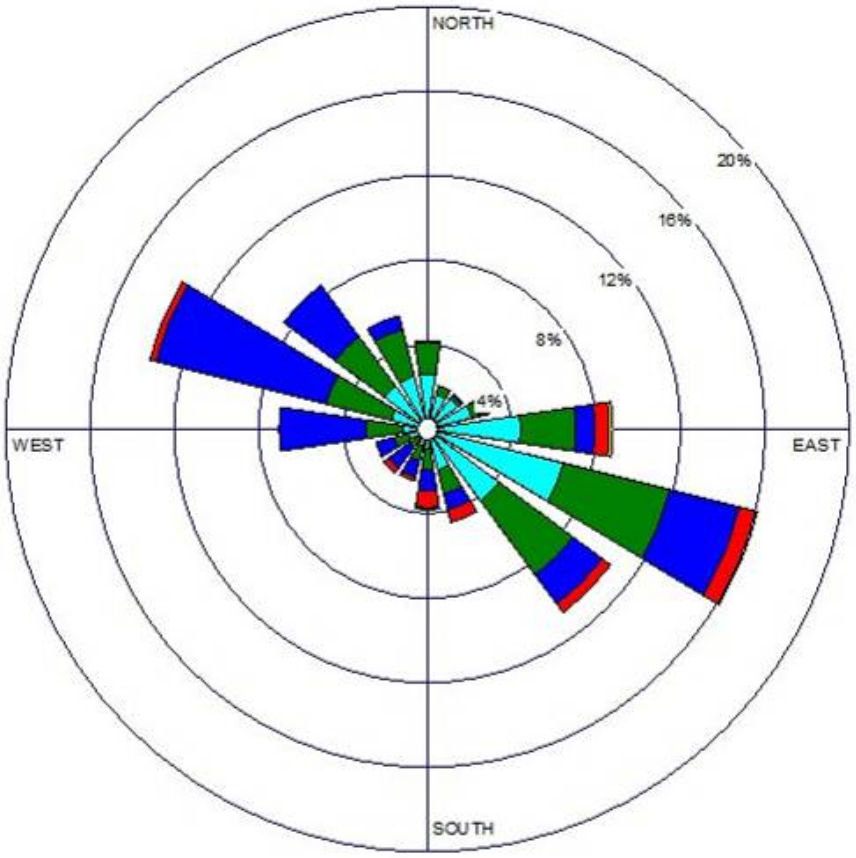
COMMENTS:	DATA PERIOD: Start Date: 7/1/2004 - 00:00 End Date: 9/30/2004 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 1.63%	TOTAL COUNT: 2208 hrs.	
	AVG. WIND SPEED: 1.86 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 4th Quarter, 2004

WIND ROSE PLOT:
OtayMesa, 4th Quarter, 2004

DISPLAY:
Wind Speed
Direction (blowing from)



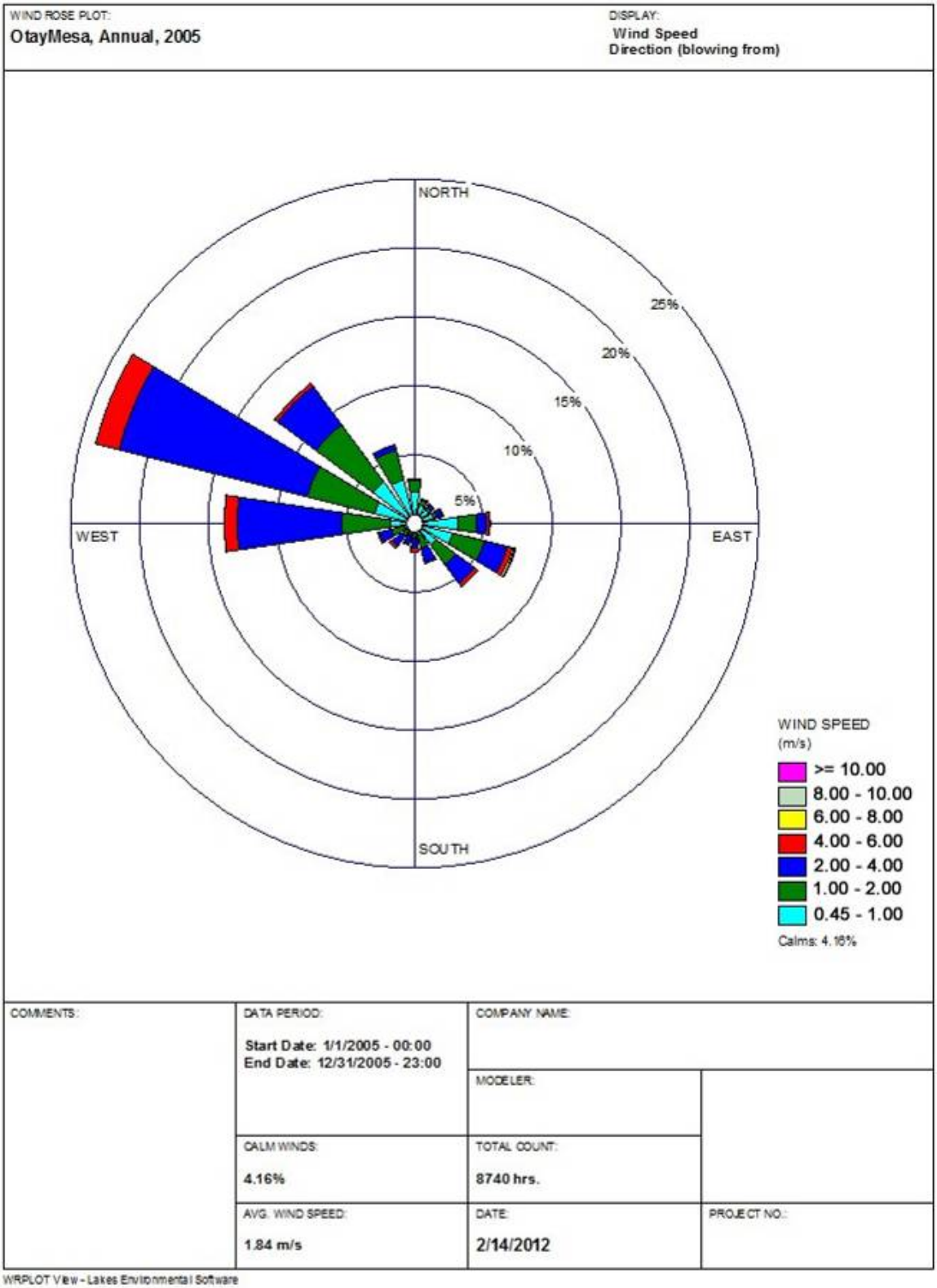
WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 2.39%

COMMENTS:	DATA PERIOD: Start Date: 10/1/2004 - 00:00 End Date: 12/31/2004 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 2.39%	TOTAL COUNT: 2208 hrs.	
	AVG. WIND SPEED: 1.67 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

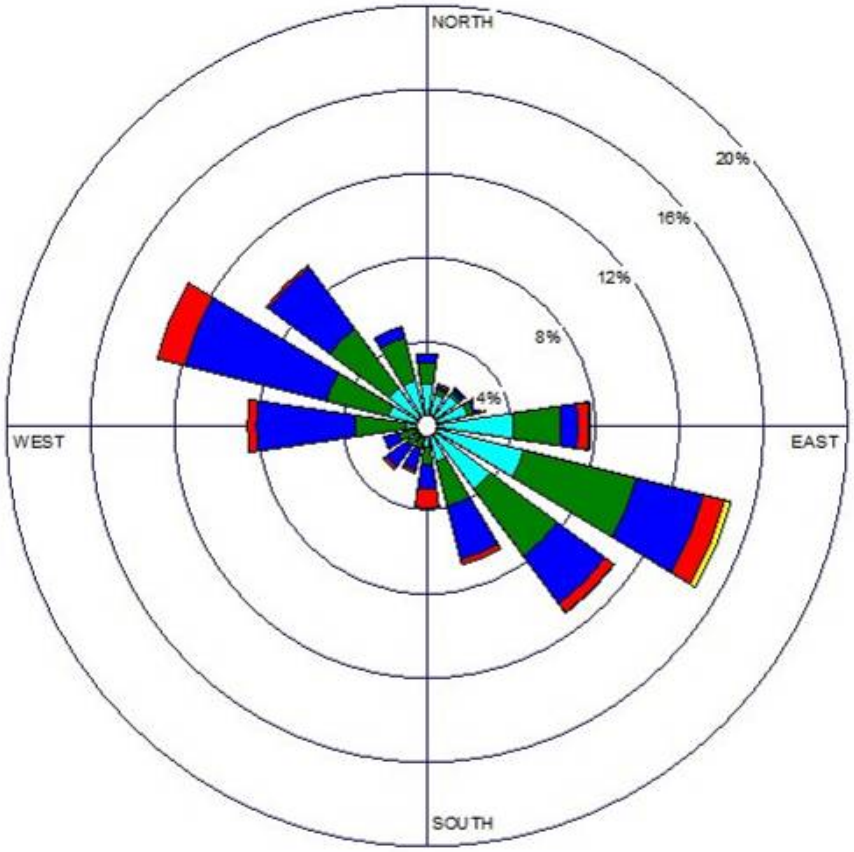
Otay Mesa – Annual, 2005



Otay Mesa – 1st Quarter, 2005

WIND ROSE PLOT:
OtayMesa, 1st Quarter, 2005

DISPLAY:
Wind Speed
Direction (blowing from)



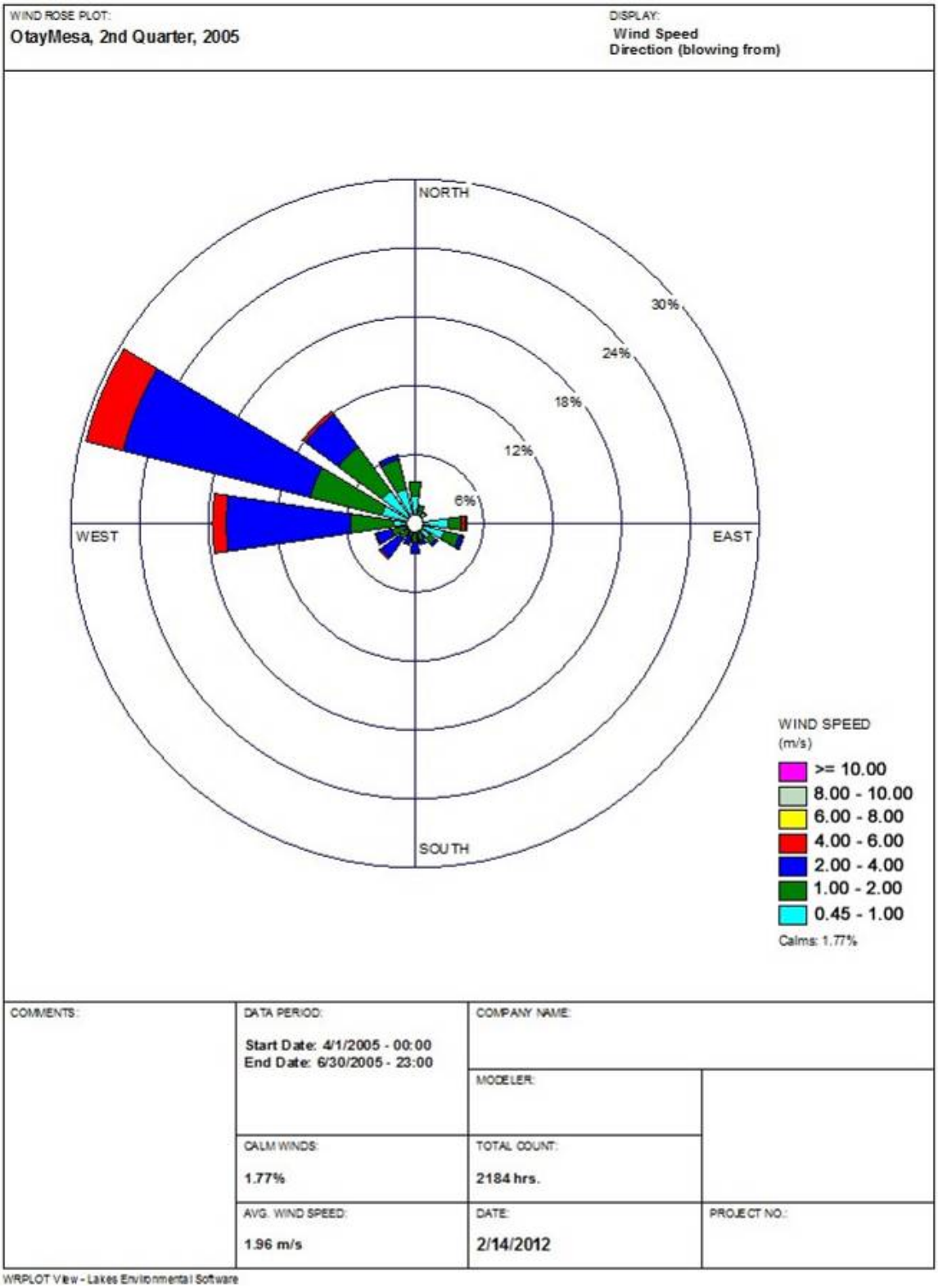
WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 1.88%

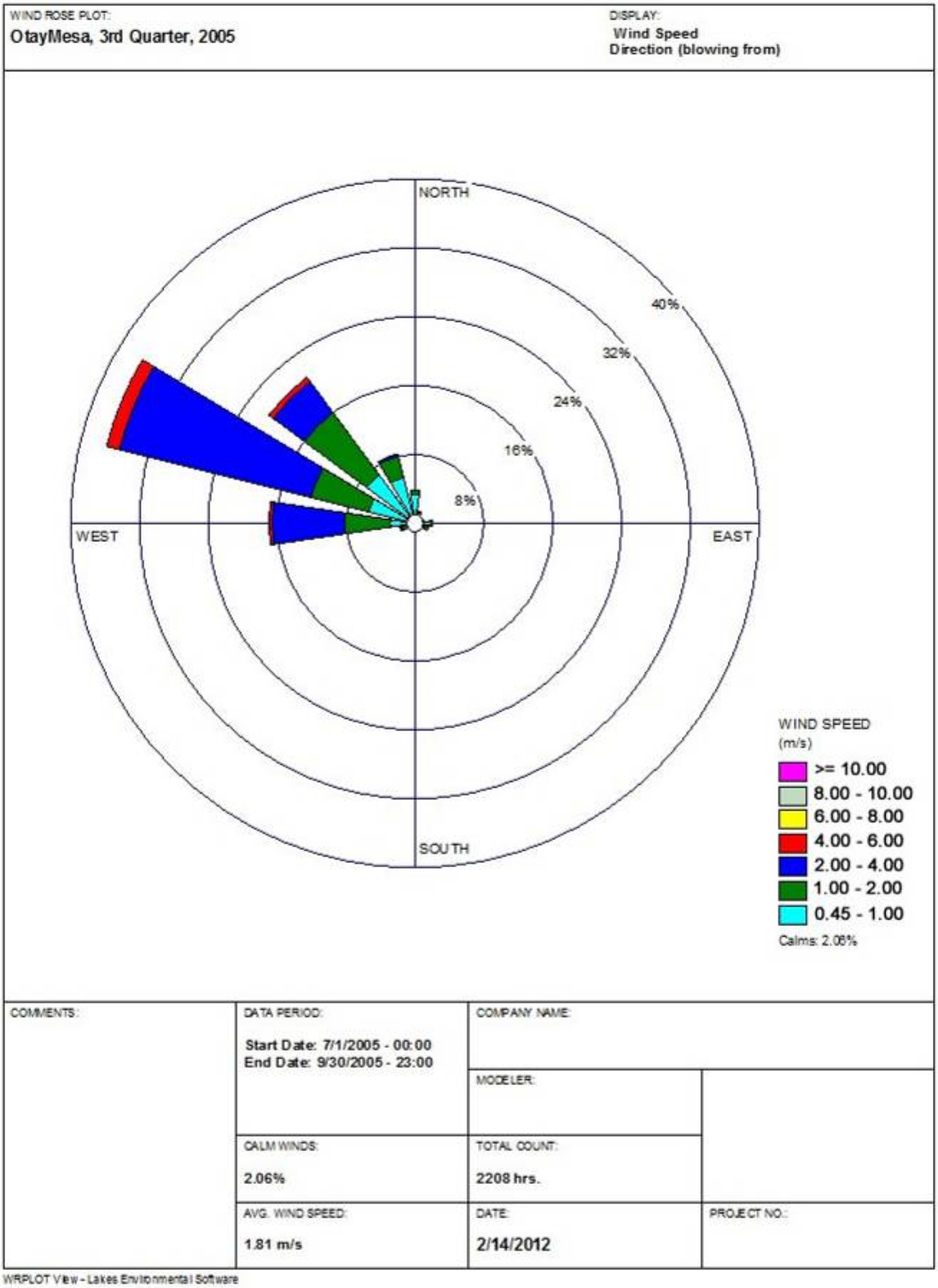
COMMENTS:	DATA PERIOD: **Start Date: 1/1/2005 - 00:00** **End Date: 3/31/2005 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **1.88%**	TOTAL COUNT: **2160 hrs.**	
	AVG. WIND SPEED: **1.83 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 2nd Quarter, 2005



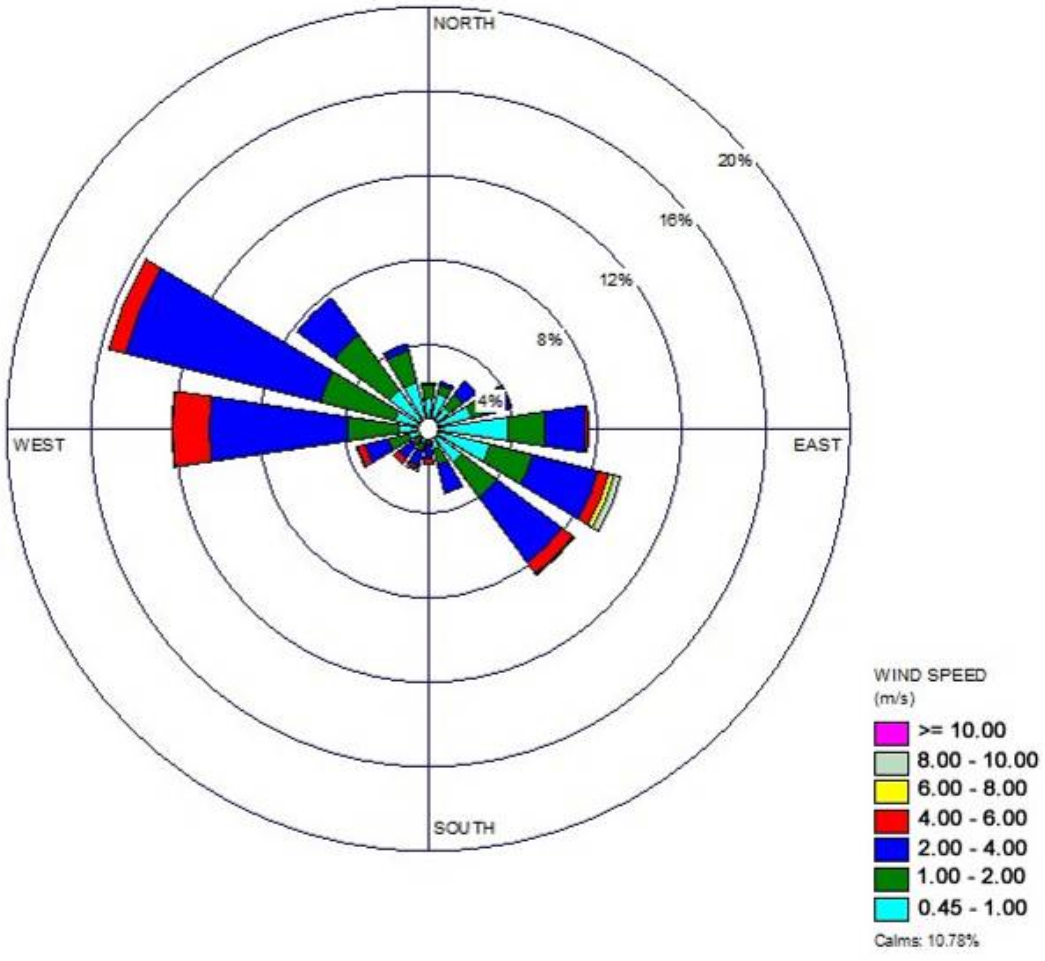
Otay Mesa – 3rd Quarter, 2005



Otay Mesa – 4th Quarter, 2005

WIND ROSE PLOT:
OtayMesa, 4th Quarter, 2005

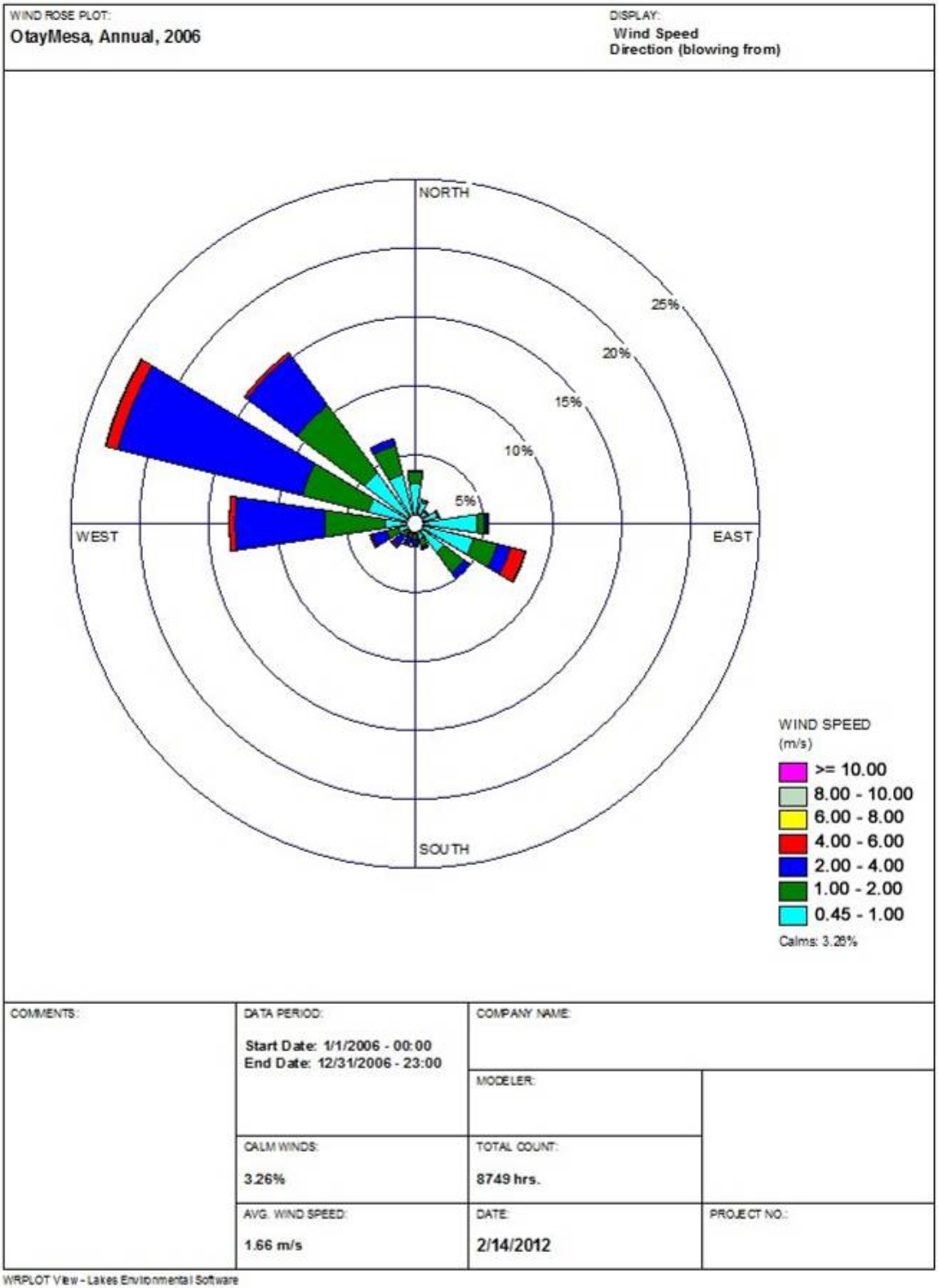
DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 10/1/2005 - 00:00 End Date: 12/31/2005 - 23:00	MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	10.78%	2188 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	1.75 m/s	2/14/2012	

WRPLOT View - Lakes Environmental Software

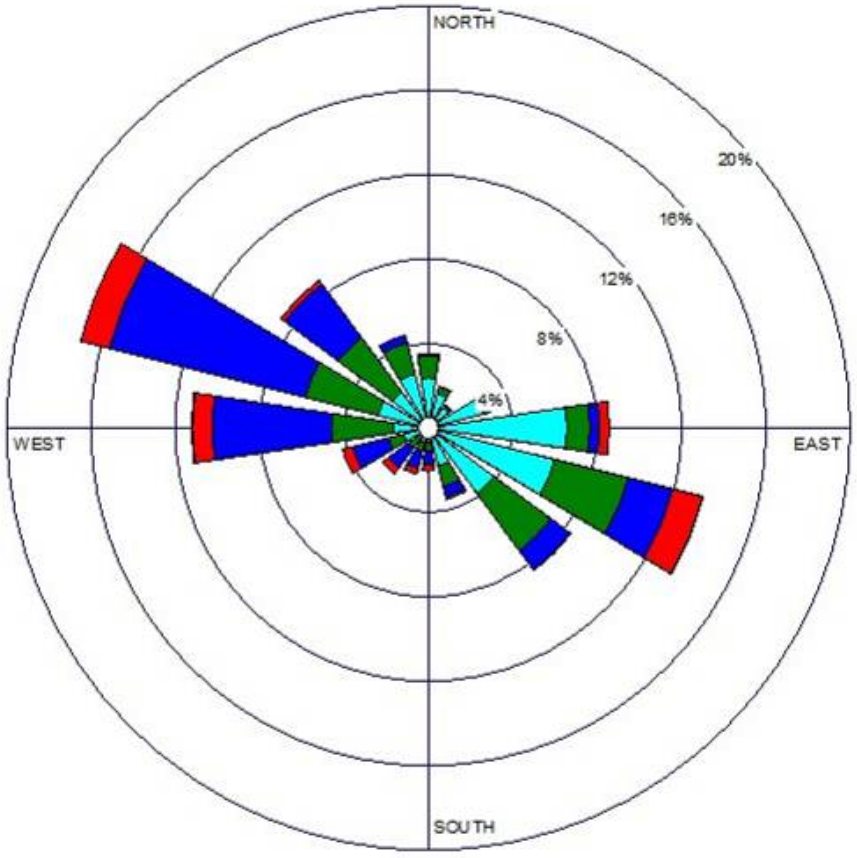
Otay Mesa – Annual, 2006



Otay Mesa – 1st Quarter, 2006

WIND ROSE PLOT:
OtayMesa, 1st Quarter, 2006

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 3.52%

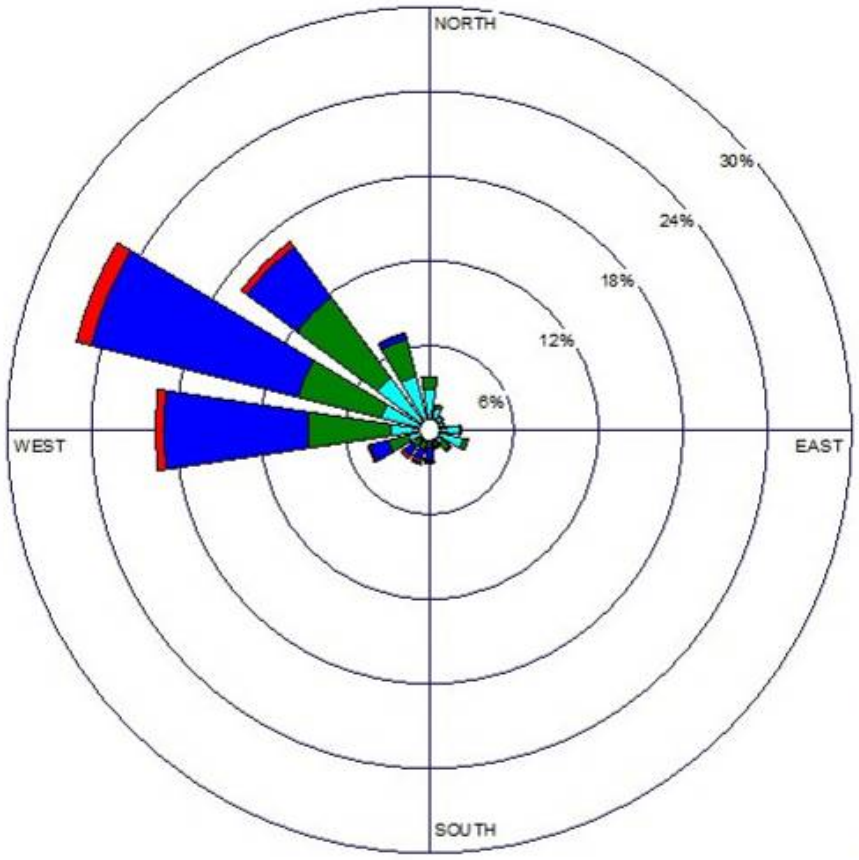
COMMENTS:	DATA PERIOD: **Start Date: 1/1/2006 - 00:00** **End Date: 3/31/2006 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **3.52%**	TOTAL COUNT: **2149 hrs.**	
	AVG. WIND SPEED: **1.69 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 2nd Quarter, 2006

WIND ROSE PLOT:
OtayMesa, 2nd Quarter, 2006

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 2.41%

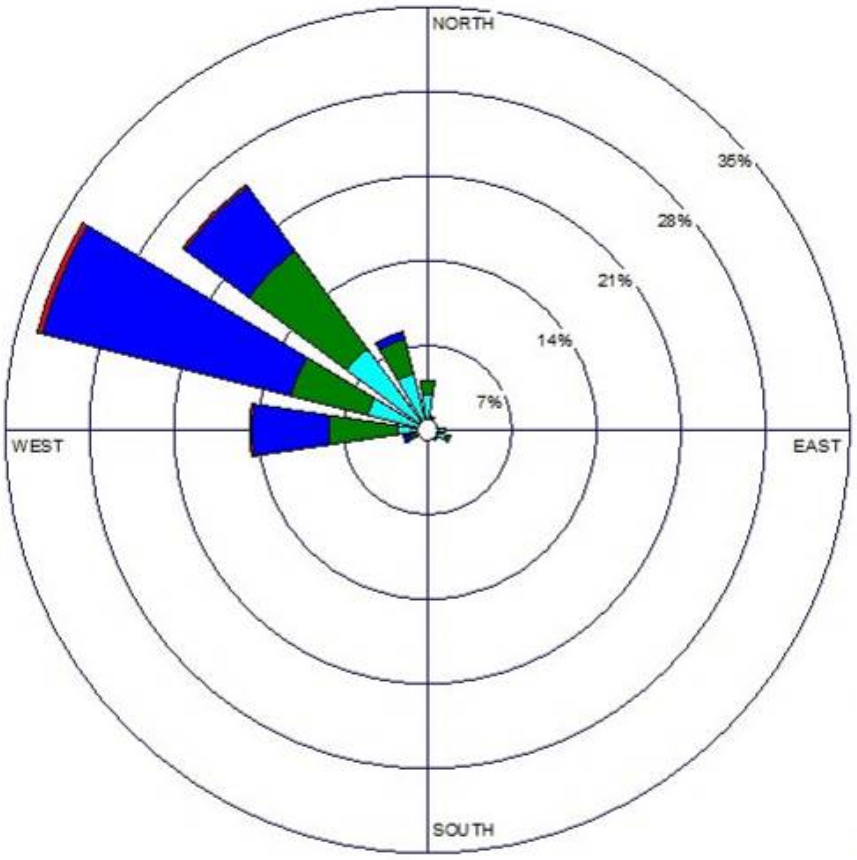
COMMENTS:	DATA PERIOD: **Start Date: 4/1/2006 - 00:00** **End Date: 6/30/2006 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **2.41%**	TOTAL COUNT: **2184 hrs.**	
	AVG. WIND SPEED: **1.76 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 3rd Quarter, 2006

WIND ROSE PLOT:
OtayMesa, 3rd Quarter, 2006

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
>= 10.00
8.00 - 10.00
6.00 - 8.00
4.00 - 6.00
2.00 - 4.00
1.00 - 2.00
0.45 - 1.00
Calms: 2.39%

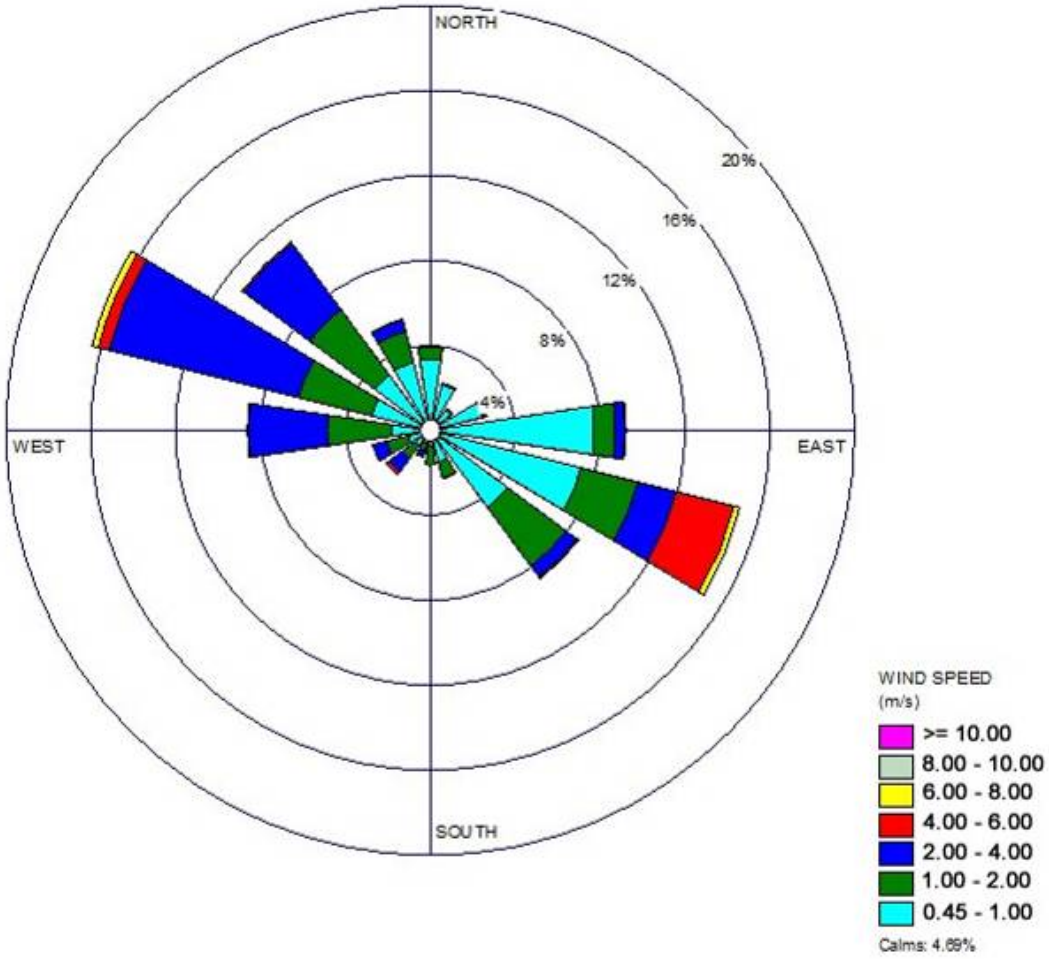
COMMENTS:	DATA PERIOD: Start Date: 7/1/2006 - 00:00 End Date: 9/30/2006 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 2.39%	TOTAL COUNT: 2208 hrs.	
	AVG. WIND SPEED: 1.72 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 4th Quarter, 2006

WIND ROSE PLOT:
OtayMesa, 4th Quarter, 2006

DISPLAY:
Wind Speed
Direction (blowing from)



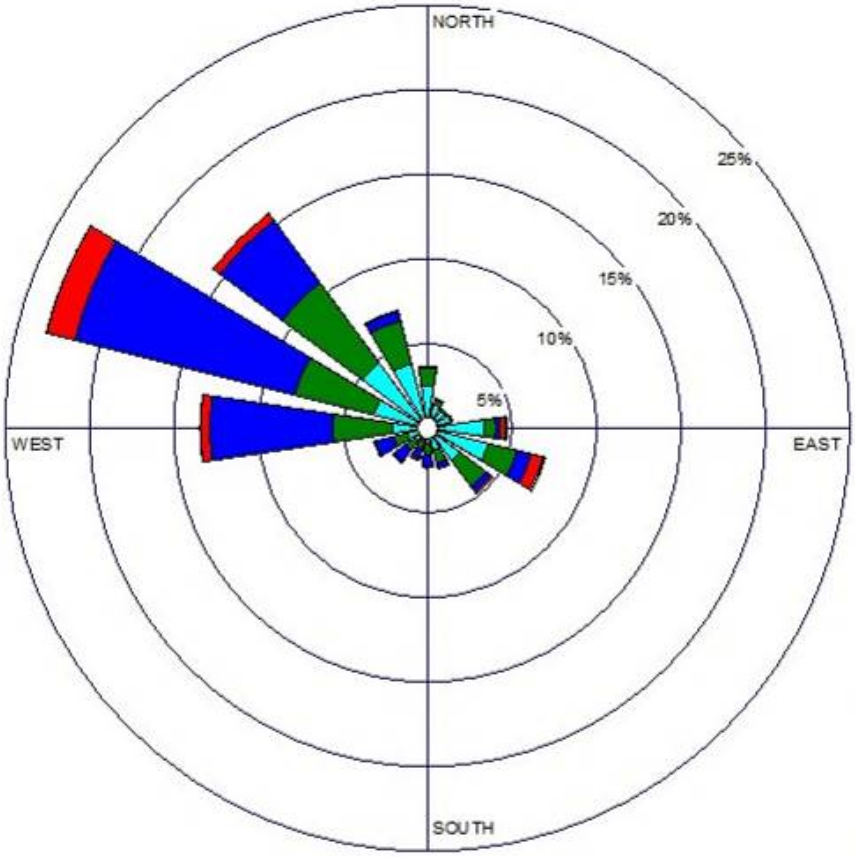
COMMENTS:	DATA PERIOD: **Start Date: 10/1/2006 - 00:00** **End Date: 12/31/2006 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **4.69%**	TOTAL COUNT: **2208 hrs.**	
	AVG. WIND SPEED: **1.48 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – Annual, 2007

WIND ROSE PLOT:
OtayMesa, Annual, 2007

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 2.65%

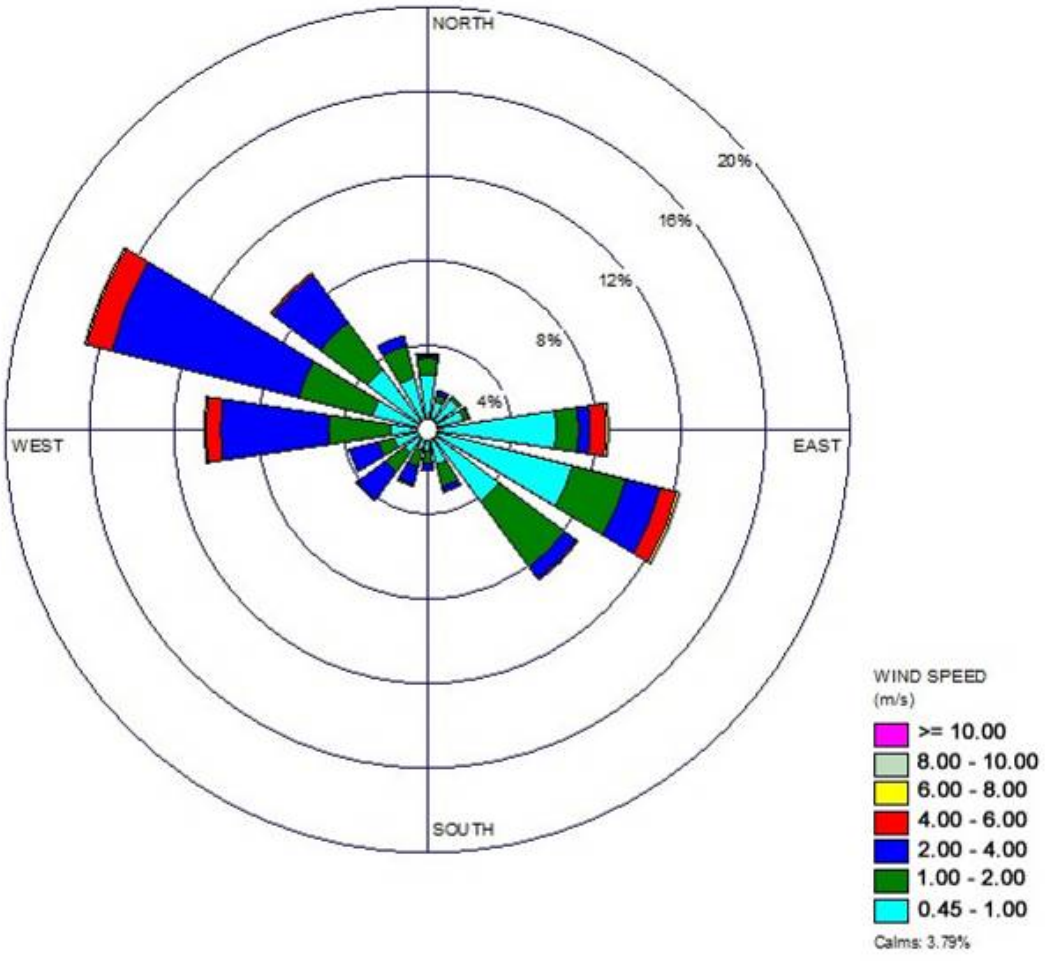
COMMENTS:	DATA PERIOD: **Start Date: 1/1/2007 - 00:00** **End Date: 12/31/2007 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **2.65%**	TOTAL COUNT: **8757 hrs.**	
	AVG. WIND SPEED: **1.74 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 1st Quarter, 2007

WIND ROSE PLOT:
OtayMesa, 1st Quarter, 2007

DISPLAY:
Wind Speed
Direction (blowing from)



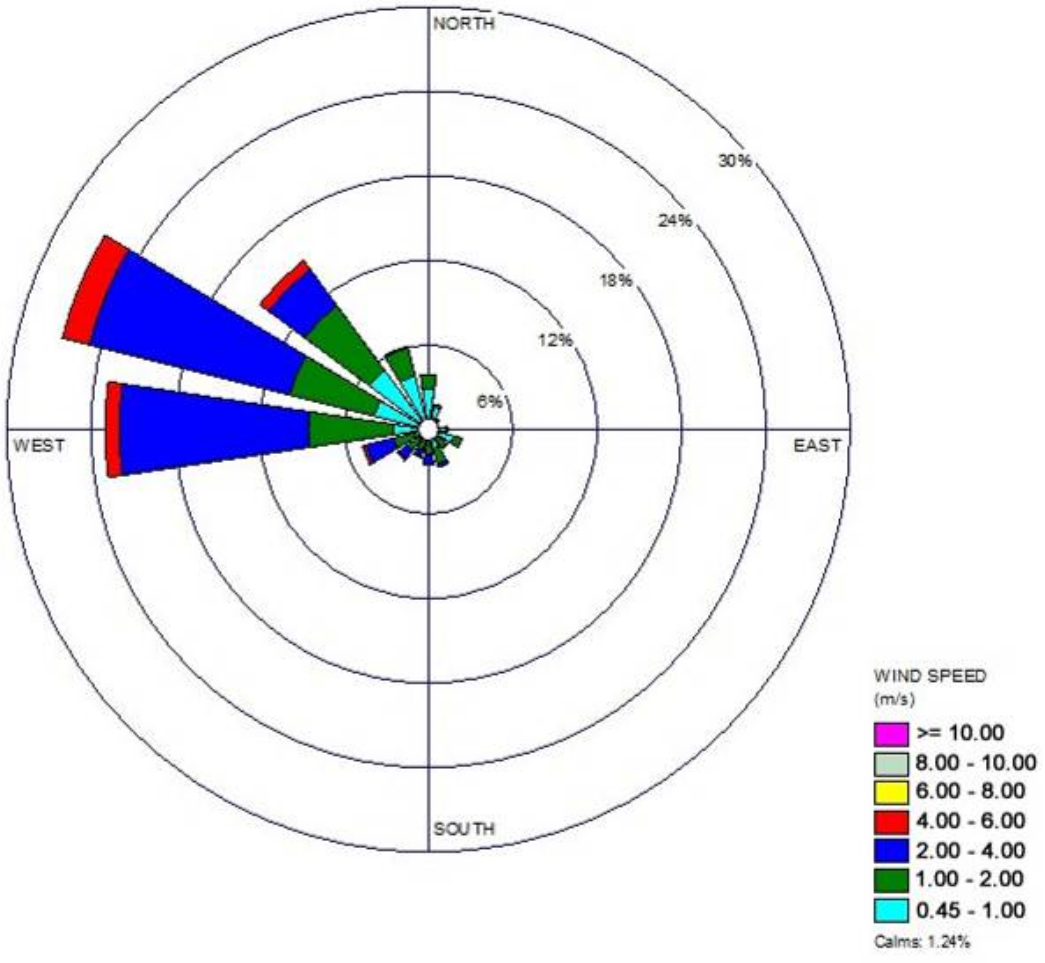
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2007 - 00:00 End Date: 3/31/2007 - 23:00	MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	3.79%	2159 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	1.57 m/s	2/14/2012	

WRPLOT View - Lakes Environmental Software

Otay Mesa – 2nd Quarter, 2007

WIND ROSE PLOT:
OtayMesa, 2th Quarter, 2007

DISPLAY:
Wind Speed
Direction (blowing from)



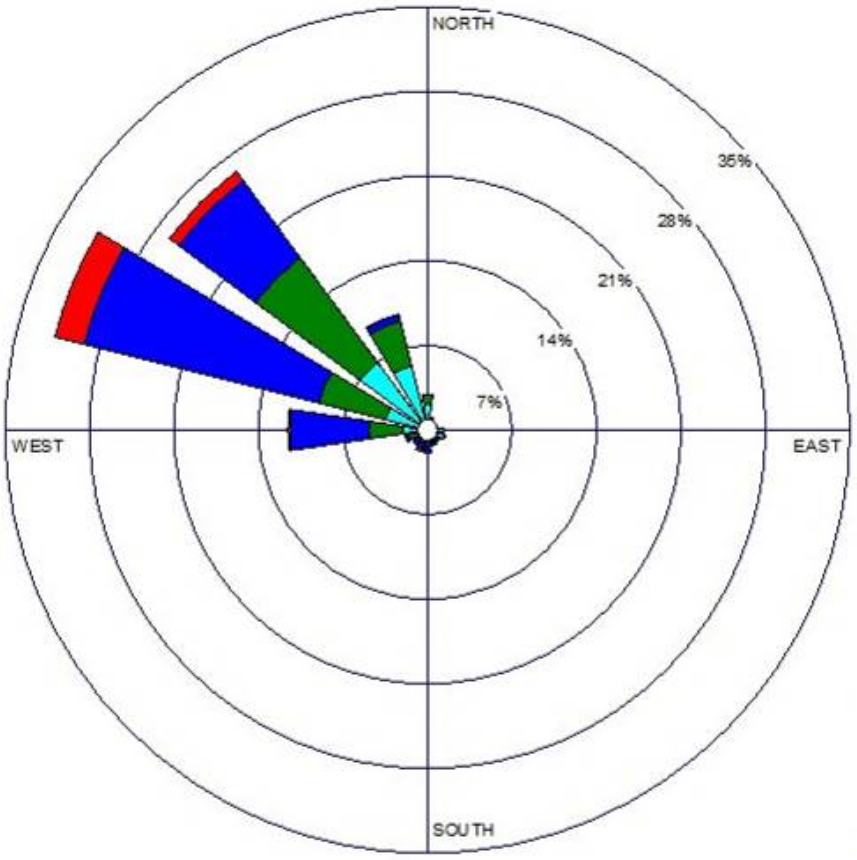
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 4/1/2007 - 00:00 **End Date: 6/30/2007 - 23:00**	MODELER:	
	CALM WINDS: **1.24%**	TOTAL COUNT: **2183 hrs.**	
	AVG. WIND SPEED: **1.87 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 3rd Quarter, 2007

WIND ROSE PLOT:
OtayMesa, 3rd Quarter, 2007

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 1.99%

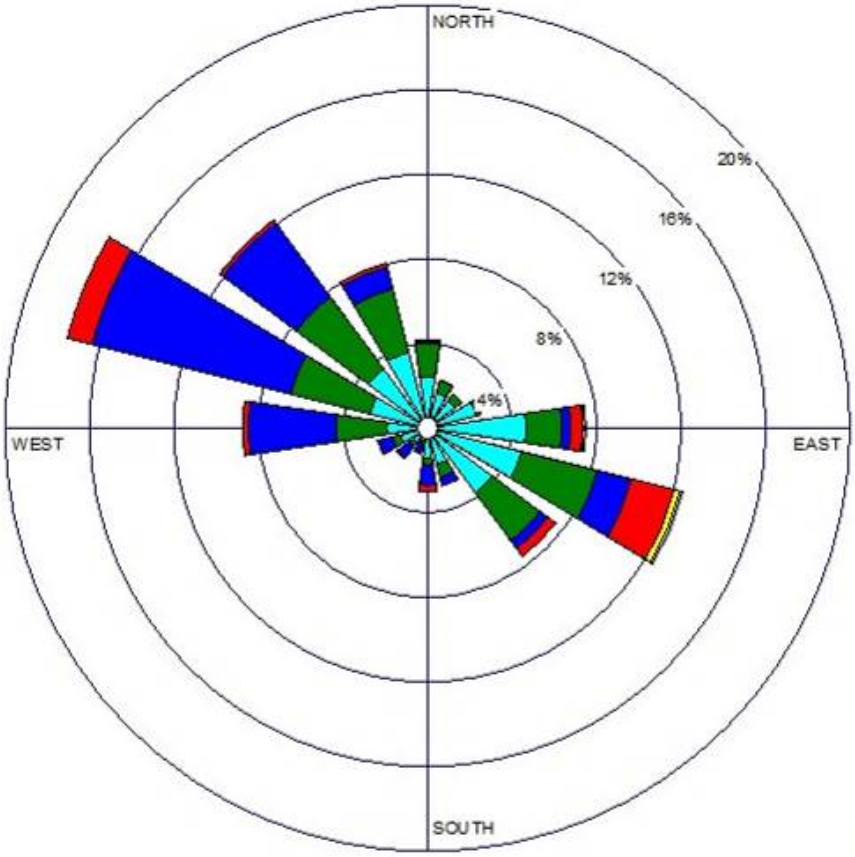
COMMENTS:	DATA PERIOD: **Start Date: 7/1/2007 - 00:00** **End Date: 9/30/2007 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **1.99%**	TOTAL COUNT: **2207 hrs.**	
	AVG. WIND SPEED: **1.87 m/s**	DATE: **2/14/2012**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 4th Quarter, 2007

WIND ROSE PLOT:
OtayMesa, 4th Quarter, 2007

DISPLAY:
Wind Speed
Direction (blowing from)



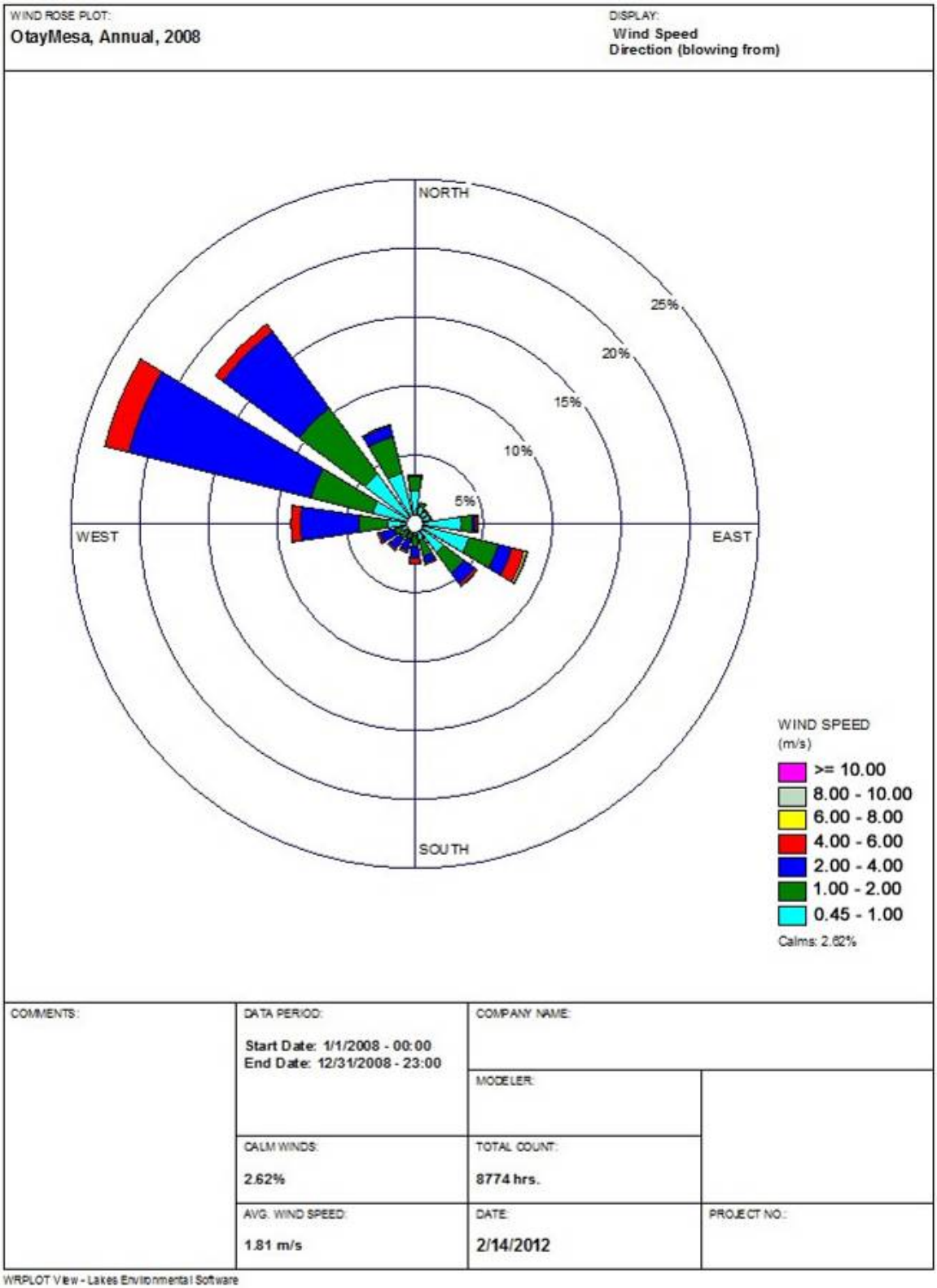
WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 3.57%

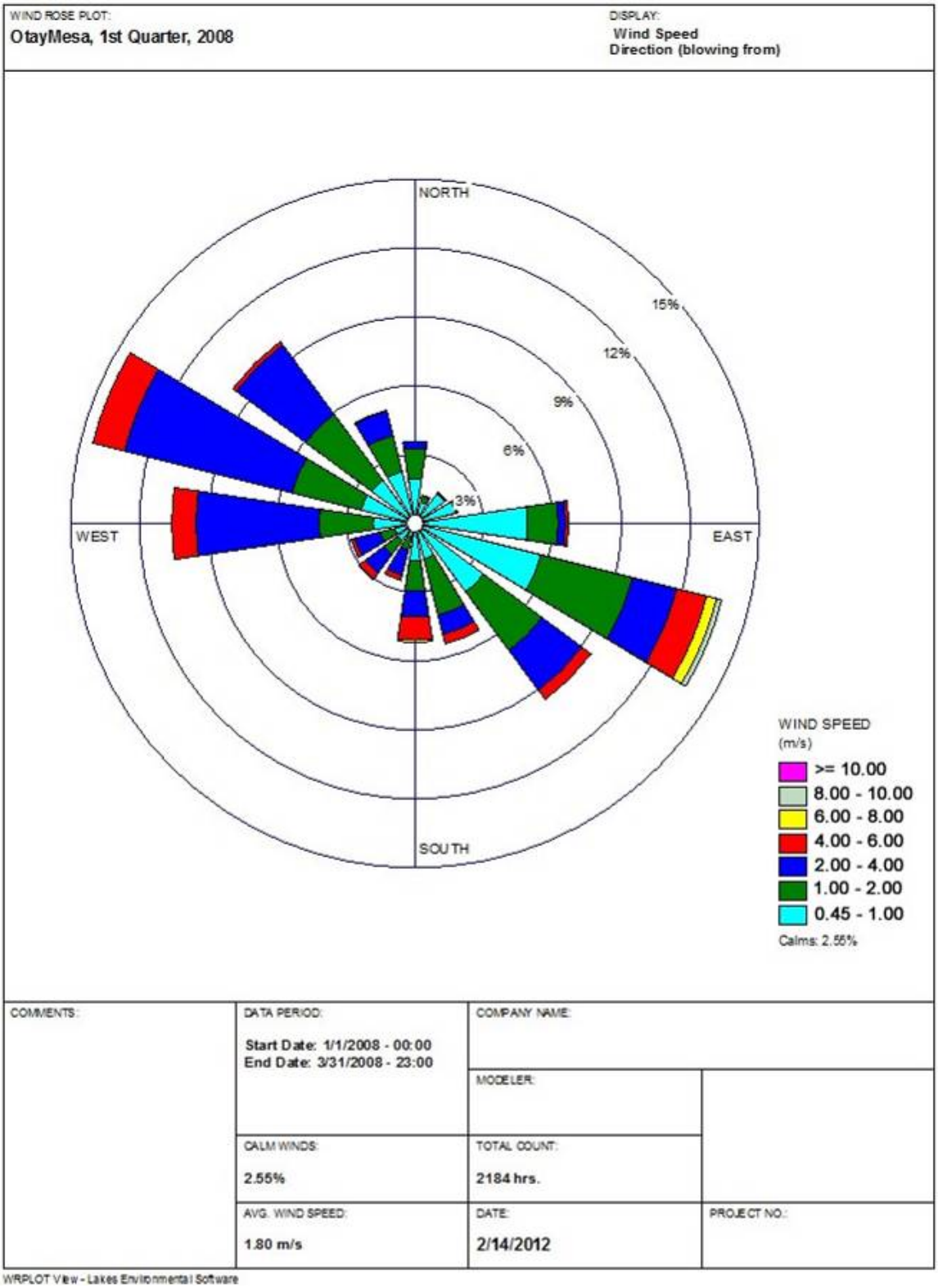
COMMENTS:	DATA PERIOD: Start Date: 10/1/2007 - 00:00 End Date: 12/31/2007 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 3.57%	TOTAL COUNT: 2208 hrs.	
	AVG. WIND SPEED: 1.65 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – Annual, 2008



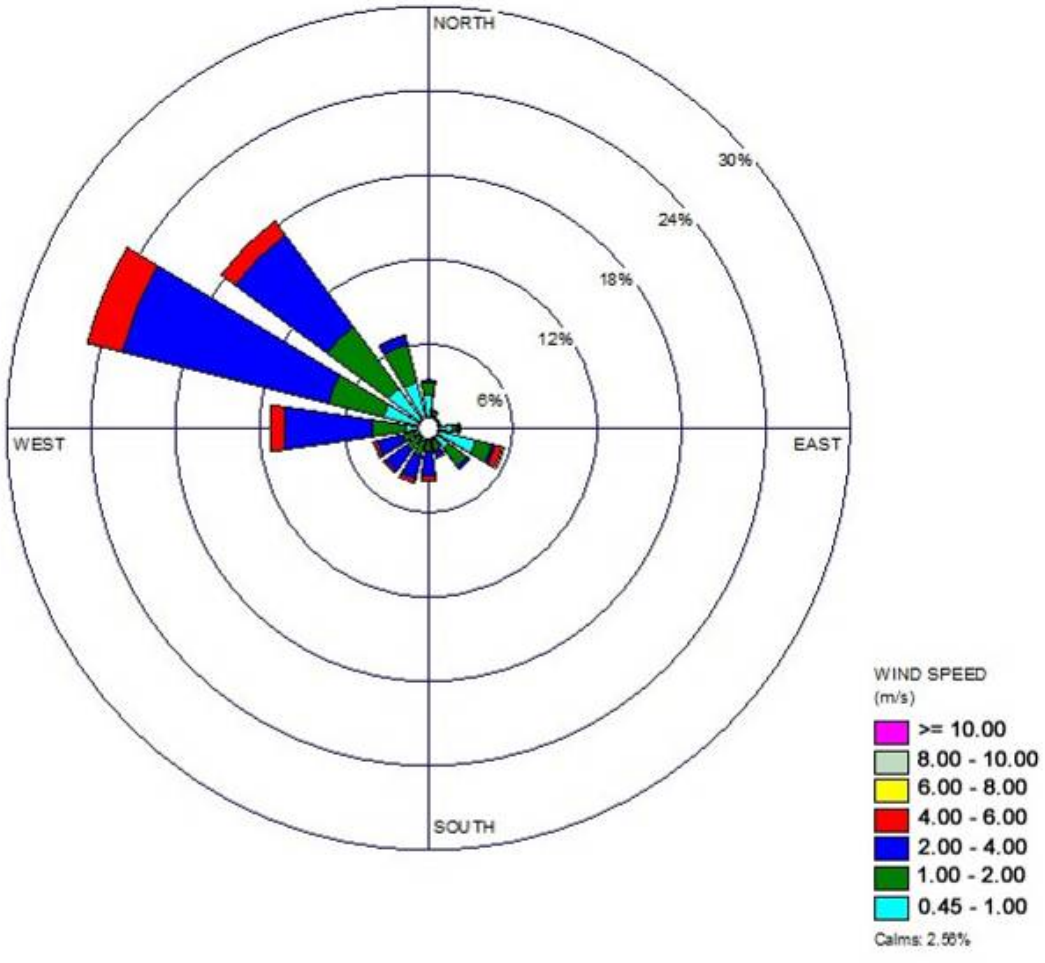
Otay Mesa – 1st Quarter, 2008



Otay Mesa – 2nd Quarter, 2008

WIND ROSE PLOT:
OtayMesa, 2nd Quarter, 2008

DISPLAY:
Wind Speed
Direction (blowing from)



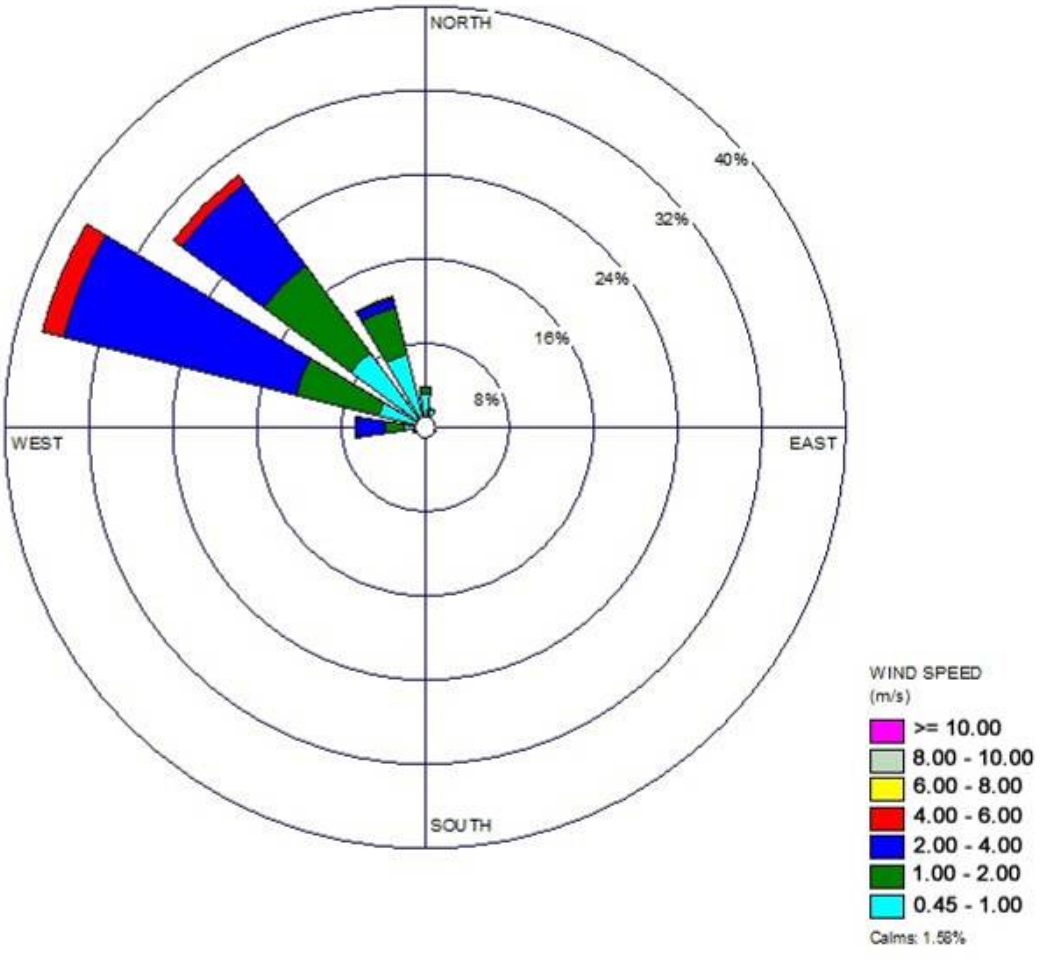
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 4/1/2008 - 00:00 End Date: 6/30/2008 - 23:00	MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	2.56%	2175 hrs.	
	AVG. WIND SPEED:	DATE:	PROJECT NO.:
	1.98 m/s	2/14/2012	

WRPLOT View - Lakes Environmental Software

Otay Mesa – 3rd Quarter, 2008

WIND ROSE PLOT:
OtayMesa, 3rd Quarter, 2008

DISPLAY:
Wind Speed
Direction (blowing from)



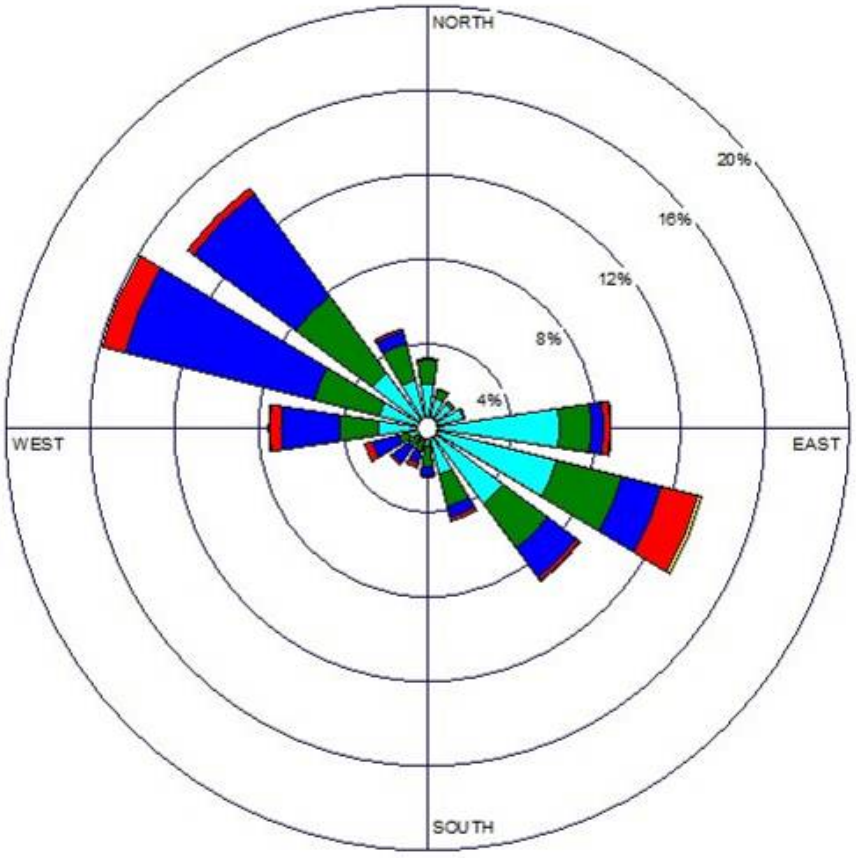
COMMENTS:	DATA PERIOD: Start Date: 7/1/2008 - 00:00 End Date: 9/30/2008 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 1.58%	TOTAL COUNT: 2207 hrs.	
	AVG. WIND SPEED: 1.82 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Otay Mesa – 4th Quarter, 2008

WIND ROSE PLOT:
OtayMesa, 4th Quarter, 2008

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)
- >= 10.00
- 8.00 - 10.00
- 6.00 - 8.00
- 4.00 - 6.00
- 2.00 - 4.00
- 1.00 - 2.00
- 0.45 - 1.00

Calms: 3.74%

COMMENTS:	DATA PERIOD: Start Date: 10/1/2008 - 00:00 End Date: 12/31/2008 - 23:00	COMPANY NAME:	
		MODELER:	
	CALM WINDS: 3.74%	TOTAL COUNT: 2208 hrs.	
	AVG. WIND SPEED: 1.65 m/s	DATE: 2/14/2012	PROJECT NO.:

WRPLOT View - Lakes Environmental Software