

**Arizona Clean Fuels Yuma, LLC**  
**Permit Number: 40140**  
**Petroleum Refinery**  
**Responsiveness Summary to Public Comments**

**INTRODUCTION**

The proposed Arizona Clean Fuels Yuma refinery will be located on an approximately 1,450-acre site, 40 miles east of Yuma, near the Community of Tacna, in Yuma County. The proposed refinery will have a crude oil atmospheric distillation capacity of approximately 150,000 barrels per day (BPD). It is expected to produce approximately 150,000 BPD of motor fuels, including approximately 85,000 BPD of motor gasoline; 35,000 BPD of diesel fuel; and 30,000 BPD of jet fuel. In addition to motor fuels, the refinery will produce liquefied petroleum gas (LPG), sulfur, and petroleum coke.

The site of the proposed refinery is located in a “clean air area” – one that has been designated as attainment or unclassifiable for all criteria pollutants under the Clean Air Act. The criteria pollutants are particulate matter less than 2.5 microns (PM<sub>2.5</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur oxides (SO<sub>x</sub>), carbon monoxide (CO), lead (Pb), and ozone (O<sub>3</sub>). The design of the proposed refinery incorporates state-of-the-art technologies for reducing air emissions. Per unit of product, the allowable emissions from the proposed Arizona Clean Fuels refinery would be significantly less than the actual emissions from any other existing petroleum refinery.

If constructed, this project would represent the first new petroleum refinery constructed in the U.S. in more than 30 years and the first facility in the western U.S. to be built specifically for the production of newer clean fuels. It would be the only petroleum refinery in Arizona, and the only large refinery between Texas and California. Several specialized commercial technologies are to be incorporated in the refinery process units to reduce fuel aromatics and sulfur, which in turn reduces emissions from vehicles.

The proposed refinery was issued a permit (#1001205) on April 14, 2005. In accordance with A.A.C. R18-2-402(D)(2), the company had an 18-month window to commence construction of the facility. The company has notified the Department that they will be unable to meet this deadline and has requested that the Department re-issue the permit for a new five-year term with a new 18-month construction window.

In order to retain the authorization to begin construction, the Permittee submitted a permit renewal application dated April 28, 2006. The Department has reviewed this application and is proposing to renew the permit without any significant revisions.

**PROCESS DESCRIPTION**

The proposed petroleum refinery would operate 24 hours a day and 365 days a year. Primary raw materials for the refinery are crude oil and natural gasoline. These materials would be delivered to the refinery primarily via a pipeline. Other raw materials include butane, propane, alkylate,

and oxygenates, which would be delivered to the refinery via rail, and natural gas, which would be received by pipeline.

Motor fuels would be shipped from the refinery by pipeline, rail, and truck. In addition to motor fuels, the refinery would produce liquefied petroleum gas (LPG), sulfur, and petroleum coke, all of which would be shipped by rail.

The proposed petroleum refinery's major process units would include a Crude Distillation Unit, a Delayed Coking Unit, a Hydrocracker Unit, a Naphtha Hydrotreater Unit, a Distillate Hydrotreater Unit, a Catalytic Reforming Unit, a Butane Conversion Unit, a Benzene Reduction Unit, and an Isomerization Unit. Supporting process units would include a Gas Concentration Plant, a Hydrogen Plant, a Sulfur Recovery Plant, an Amine Regeneration Unit, a Sour Water Stripper, and a Wastewater Treatment Plant. Ancillary equipment would include storage tanks, loading and unloading racks, emergency flares, steam boilers, a cooling tower, an emergency generator, and two emergency fire water pumps.

### **BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

As required by the PSD rule under Article 4 of A.A.C. Title 18, Chapter 2, the Department made determinations of BACT for each emission unit at the refinery and for each pollutant emitted. The process used by the Department in making its BACT determinations starts with a review of the control measures used by other similar sources, including other petroleum refineries nationwide. The Department then establishes emission limits based on the maximum achievable degree of emission reduction, taking into account technical feasibility, environmental impacts, economic impacts, energy impacts, and other costs. In the case of the Arizona Clean Fuels refinery, the Department's BACT determinations would ensure that this would be, by far, the lowest-emitting, fully integrated petroleum refinery in the U.S.

The air quality permit includes requirements for numerous, state-of-the-art emission control measures that are exceptionally stringent relative to the air quality permits for most petroleum refineries. A full discussion of the emission control measures can be found in Section V of the Technical Support Documents. Examples of these measures include the following:

- The refinery design does not include a fluidized catalytic cracking unit, and the permit does not allow the construction of such unit. Nearly all other petroleum refineries include a fluidized catalytic cracking unit, and this unit is generally the largest-emitting unit at a refinery. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably a Hydrocracker Unit.
- The refinery design does not include any alkylation processes that require the use of hydrofluoric acid or sulfuric acid as catalysts, and the permit does not allow the construction of such processes. Most other petroleum refineries include these types of alkylation processes, which are potential sources of toxic chemical releases. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably the Butane Conversion Unit.
- The permit prohibits the use of flares as pollution control devices for intermittent or routine, non-emergency hydrocarbon releases. Most other petroleum refineries do

currently use elevated flares for this purpose. This commonly results in visible exposed flames, excessive VOC and CO emissions, and difficulty in monitoring and tracking air pollutant emissions. As with all petroleum refineries, the Arizona Clean Fuels refinery would include flares for the safe disposal of gases released during emergencies.

- The permit prohibits the combustion of fuel oil in the refinery's boilers and heaters. Natural gas and fuel gases generated within the refinery are the only fuels allowed. Most petroleum refineries do burn fuel oil, which results in higher emissions of several air pollutants.
- The permit requires highly efficient removal of sulfur from fuel gas burned in the refinery's process heaters, so that the sulfur concentration is maintained at or below 35 parts per million by volume. This would be nearly 80 percent lower than the applicable emission standards for most other petroleum refineries, and the Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.
- The permit requires the use of ultra-low-NO<sub>x</sub> burners (ULNB) for control of NO<sub>x</sub> emissions from all boilers and heaters. Nearly all petroleum refineries have at least some boilers and heaters that are not so equipped.
- The permit requires the use of selective catalytic reduction (SCR), in addition to ULNB, for control of more than three-fourths of the residual NO<sub>x</sub> emissions. In other words, SCR is required for process heaters that comprise more than three-fourths of the refinery's total heat input capacity. Most refineries are not required to employ SCR systems for NO<sub>x</sub> control on any boilers or process heaters.
- The permit limits ammonia emissions from the SCR-equipped process heaters to a maximum concentration of 5 parts per million by volume. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a limit that is more stringent.
- The permit requires highly efficient recovery of sulfur from refinery waste streams, with a design efficiency level of more than 99.97 percent and an SO<sub>2</sub> emission limit of only 33.6 pounds per hour. The Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.
- The permit requires the refinery to meet several equipment design standards and work practice requirements in order to minimize SO<sub>2</sub> emissions during upsets and malfunctions of the sulfur recovery process. These measures include a requirement to curtail operations and to divert sulfur-containing streams in order to eliminate excess emissions within 15 minutes after the beginning of a process upset, and requirements for excess capacity sufficient to allow the refinery to operate for at least 24 hours during such an upset without further excess emissions. The Department considers this to be an important element of the refinery's design and a focus of the BACT analysis because, in the absence of such measures, the refinery could emit SO<sub>2</sub> at a rate approaching 75 tons per hour during upsets and malfunctions. (This is more than 4,000 times the maximum allowable SO<sub>2</sub> emission rate of 33.6 pounds per hour during normal operations.) The Department is not aware of any other petroleum refinery that is required to meet requirements that are this stringent.
- The permit requires the use of gas compression for recovery and in-process recycling of hydrocarbon vapors from selected hydrocarbon liquid storage tanks. This configuration would result in near-zero emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.

- The permit requires the use of floating roofs in tandem with a thermal oxidizer for control of VOC emissions from all remaining storage tanks. This configuration would result in near-zero emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.
- The permit requires the use of thermal oxidizers for control of VOC emissions from each vessel within the refinery's Wastewater Treatment Plant. The permit requires that this thermal oxidizer be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve such a high level of VOC emission reduction.
- The permit requires the use of carbon adsorption systems for control of VOC emissions from all drains and sumps within the refinery's wastewater collection system. The permit also requires that each system include two carbon canisters in series in order to ensure the maximum feasible degree of VOC reduction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a higher level of VOC emission reduction.
- The permit requires the use of vapor recovery in tandem with thermal oxidizers for control of VOC emissions from gasoline loading into tank trucks and rail cars. This would result in 99.99 percent control of VOC emissions. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve as high a level of VOC emission control.
- The permit requires the use of thermal oxidizers for control of VOC emissions from loading of diesel fuel and aviation jet fuel into tank trucks and rail cars. The permit requires each of these thermal oxidizers be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to employ this equipment configuration or to achieve such a high level of VOC emission reduction.
- The permit requires the use of low-NO<sub>x</sub> burners to minimize emissions of NO<sub>x</sub> from thermal oxidizers used to control VOC emissions, this equipment is state of the art and used in California refineries.
- The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in equipment such as valves and pumps. More than 60,000 components (individual pieces of equipment) will be subject to these requirements. Although nearly all petroleum refineries are required to implement "Leak Detection and Repair" or "LDAR" programs under federal regulations, the program required by the proposed permit exceeds the requirements of other programs in a variety of ways:
  - More extensive LDAR program applicability: The proposed permit includes LDAR program requirements for flanges and screwed connectors, which represent nearly half of the total number of affected components. The LDAR program requirements at most refineries do not extend to this type of equipment.
  - Lower leak levels: Under the proposed permit, equipment is deemed to be leaking if the measured concentration exceeds 100 parts per million by volume (ppmv) for some

- types of components and 500 ppmv for all other types. The LDAR program requirements for most refineries do not consider equipment to be leaking until the concentration is 10,000 ppmv, which is 20 to 100 times as high as the limit in the proposed permit.
- Faster repair requirements: Under the proposed permit, a first attempt at repair is required within 24 hours, and successful repair is generally required within 7 days. The LDAR programs at most refineries only require that a first attempt at repair be made within 5 days and that successful repair be completed within 15 days.
  - Limits on the number of leaking components: Under the proposed permit, repair could be delayed beyond the 7-day period that is generally required, but only to the extent that the number of leaking components is less than a very small percentage of similar components refinery-wide. The LDAR programs at most refineries do not include any such restrictions.
  - More frequent monitoring: The proposed permit requires frequent monitoring of all types of components, regardless of refinery's past achievements with regard to the percentage of leaking components. For example, the proposed permit requires quarterly monitoring of valves, whereas the LDAR programs at most refineries would require only annual monitoring.
  - The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in the refinery's cooling water system. The permit specifies continuous monitoring of all cooling water streams at the Arizona Clean Fuels refinery. The Department is not aware of any other petroleum refinery or similar facility that is required to implement a program for minimizing VOC emissions from cooling towers that is this stringent. Most petroleum refineries are not required to implement any type of LDAR program for the cooling water system, and the few that are generally are required to perform sampling only four times per year. This potentially allows for tremendous quantities of VOC to be emitted from the cooling towers without detection.
  - The permit restricts the emergency generator and the emergency fire water pumps to burning only ultra-low-sulfur Diesel fuel in order to minimize SO<sub>2</sub> emissions. The Department is not aware of any other petroleum refinery that is required to comply with a restriction that is this stringent.
  - The permit requires that the emergency generator and the emergency fire water pumps be designed and equipped with combustion modifications to minimize emissions of NO<sub>x</sub>, CO, and PM<sub>10</sub>. The emission limits in the proposed permit are much more stringent than those imposed on any similar facility.

## **EMISSION IMPACT ANALYSES**

The site of the proposed refinery is located in a "clean air area" – one that has been designated as attainment or unclassifiable for all criteria pollutants under the Clean Air Act.

As part of the permit application review process, the Department performed a detailed review of the Ambient Air Quality Impact Analysis performed by the applicant, including confirmatory dispersion modeling. Based on the result of this review, the Department has concluded that the

proposed refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS), PSD Increment, or Arizona Ambient Air Quality Guideline (AAAQG) level. Specifically, the analysis shows the following:

- The maximum predicted ambient concentration of PM<sub>10</sub> is less than 64 percent of the annual NAAQS and less than 54 percent of the 24-hour NAAQS. Each of these values includes all existing sources and background concentration; the refinery's modeled impact represents less than 4 percent of the predicted annual average concentration and less than 15 percent of the predicted 24-hour average concentration.
- The maximum predicted ambient concentration of SO<sub>2</sub>, including all existing sources and background concentration, is less than 15 percent of the NAAQS for each of the three averaging periods (3-hr, 24-hr, and annual). The refinery's modeled impact represents less than 10 percent of the NAAQS for each of the three averaging periods. The modeled impact of the refinery on ambient NO<sub>x</sub> concentration is less than 1 percent of the NAAQS.
- The modeled impact of the refinery on ambient CO concentration is less than 2 percent of the NAAQS.
- The modeled impact of the refinery is less than all applicable PSD increments.
- The modeled impact of the refinery on ambient concentration of state air toxics is less than ten percent of the AAAQG for 34 of the 46 hazardous air pollutants expected to be emitted by the plant. For the remaining 12 pollutants, ambient impacts were mitigated to the maximum possible extent and were deemed to meet requirements. These pollutants, and the ambient impact as a percentage of the AAAQG, are as follows:

Benzene (93%)	Mercury (20%)
Chlorine (74%)	Cadmium (18%)
H <sub>2</sub> S (47%)	Aluminum (16%)
Silver (44%)	Lead (15%)
Formaldehyde (28%)	Phenol (13%)
Selenium (28%)	Ammonia (11%)

## **PUBLIC PARTICIPATION PROCESS**

Public notices for the draft permit, including the date and time for the public hearing, were published in the Arizona Republic and the Yuma Daily Sun on May 31, 2006, and June 6, 2006. Additional public notices were published in the Bajo El Sol (Yuma) newspaper on June 2, 2006, and June 9, 2006. A public hearing was held in Wellton on July 6, 2006.

Comments, questions, and objections were received during the public comment period in both verbal and written formats. This summary presents the Department's responses to the issues raised during the public comment period.

Several individuals who submitted written comments on draft permit number 40140 also had submitted comments during the public participation process for the initial draft permit (number

1001205) for the proposed refinery. One of these commenters, in his comment letter for this permitting action, incorporated by reference all comments that he submitted in the earlier permitting action. To the extent that those comments were not separately reiterated in the current comment letter, the earlier comments are not separately addressed in this responsiveness summary. Instead, the Department's earlier responses to those comments, as presented in the April 2005 responsiveness summary, are incorporated by reference herein.

### **Project Need**

*Inquiries were made regarding the need for a refinery in order to satisfy the demand for gasoline in Arizona.*

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the site proposed by the applicant. The need for the project in order to satisfy societal needs is not a consideration in the air permit application review and approval process.

### **Project Viability**

*Concerns were expressed regarding the viability of the refinery project.*

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the project proposed by the applicant. The viability of the project is not a consideration in the permit application review and approval process.

### **Site Selection**

*One commenter expressed concern regarding the environmental justice implications of siting the refinery at the proposed location.*

Because the Department receives federal financial assistance, the Department's decision regarding the air permit is subject to Title VI of the Civil Rights Act, 42 U.S.C. § 2000d et seq. The Department has committed to seek out and be responsive to community concerns regarding public health and the environment, including all claims of inequity due to environmental impacts.

Consistent with guidance from the U.S. EPA and the federal Council on Environmental Quality, the Department has evaluated the impacts that issuance of the refinery's air permit will have on minority communities. Based on this evaluation, the Department has determined that the issuance of the refinery's air permit will not result in any disparate, adverse impacts on any minority community. A copy of ADEQ's analysis is available upon request.

*Concerns were expressed regarding the site selection process.*

The Department played no role in the site selection process for the refinery. For a proposed stationary source in a clean air area, such as the site of the proposed refinery, the Department has

no authority to require an analysis of alternative sites. Where the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case here, the Department is legally obligated to issue the air permit for the site proposed by the applicant.

### **Air Quality Impact Analysis**

#### ***Concerns were expressed regarding the effects on ozone levels due to air pollutant emissions from the refinery.***

Unlike other pollutants of concern, ozone will not be directly emitted by the refinery. Rather, stratospheric ozone formation occurs by a series of complex photochemical reactions involving NO<sub>x</sub> and VOC, both of which will be emitted by the refinery. Due to this formation mechanism, ozone modeling is performed on a regional scale using three-dimensional photochemical grid models, whereas modeling for other pollutants emitted from individual sources is generally performed using Gaussian plume models. Arizona and federal permitting regulations do not require ozone impact analyses for stationary source permitting.

The Permittee performed and submitted an ozone impact analysis in August 2002, as part of the permit application for a proposed refinery in Maricopa County. That analysis showed that the refinery would not have any adverse impact on the Phoenix ozone nonattainment area, even when sited less than 10 miles outside the nonattainment area and with significantly higher modeled VOC emission rates than are allowed by the proposed permit. In light of the much greater distance to the Phoenix ozone nonattainment area and the reductions in allowable VOC emissions relative to the previous modeling analysis, the Department concluded that no further analysis is necessary for the present refinery location.

#### ***Concerns were expressed regarding the use of upper air data from Tucson in dispersion modeling performed as part of the air quality impacts analysis.***

Representativeness of meteorological data is a function of the height of the measurement; there is much less site-to-site variability for upper air measurements than for measurements taken close to the surface. As a result, upper air measurements are gathered at a relatively small number of locations and are considered representative of large spatial domains. The Department has concluded that upper air data gathered in Tucson are sufficiently representative of the proposed refinery site to be acceptable for use in the air quality impact analysis.

#### ***A concern was expressed regarding the fact that the air quality impact analysis did not take into account emissions from startups, shutdowns, and upsets.***

The purpose of the air quality impact analysis is to ensure that the allowable emissions from the refinery will not cause or contribute to any violation or exceedance of any ambient air quality standard or guideline level. A separate but equally important element of the air permit application review and approval process is a determination by the Department that the refinery, when constructed and operated in accordance with good air pollution control practices, can achieve continuous compliance with the permitted emission limitations and standards. In light of these two determinations made by the Department, the air quality impacts analysis is properly

based on the maximum allowable emission rates, as was done in the case of the refinery. The Department does not engage in speculation as to the air quality impacts of unanticipated non-compliance.

### **Ambient Monitoring and Emission Monitoring**

*Concerns were expressed regarding the adequacy of the permit with regard to ambient monitoring requirements.*

The proposed permit requires ambient monitoring networks for benzene, particulate matter, and hydrogen sulfide to ensure that off-site concentrations of these air pollutants do not exceed guideline or allowable levels. These monitoring requirements are in excess of what is required by federal and state air quality regulations, and the Department has determined that these requirements are adequate to ensure that no ambient air quality standards will be threatened by the proposed refinery.

*Concerns were expressed regarding the opportunity for public participation in the design of the required ambient monitoring networks.*

The substantive requirements relating to installation and operation of ambient monitoring networks for benzene, particulate matter, and hydrogen sulfide are included in the proposed permit and were made available for public comment. These monitoring requirements are in excess of what is required by federal and state air quality regulations, and the Department has determined that these requirements are adequate to ensure that no ambient air quality standards will be threatened by the proposed refinery. The technical details of the monitoring networks are subject to review and approval by the Department. There is no regulatory basis for delaying implementation of these monitoring networks while providing an opportunity for public comment. The ambient monitoring plans, as all records and reports not containing confidential information, will be made available to the public pursuant to A.R.S. § 49-432. Records and reports are available at the Department's offices at 1110 West Washington Street in Phoenix, and can also be requested by contacting the Department's Records Center at (602) 771-4380, or toll-free in Arizona at (800) 234-5677, extension 771-4380.

*Concerns were expressed regarding the adequacy of the permit with regard to emission monitoring.*

The permit includes all applicable requirements pertaining to monitoring, recordkeeping, and reporting, including requirements for 50 continuous emission monitoring systems.

### **Health Effects**

*Concerns were expressed regarding the effect of air pollutant emissions from the refinery on incidences of asthma and other respiratory problems in the local population, particularly in children and the elderly.*

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National

Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

***Concerns were expressed regarding the effect of air pollutant emissions from the refinery on incidences of cancer in the local population.***

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any Arizona Ambient Air Quality Guideline (AAAQG). The AAAQG have been established at levels that limit excess lifetime cancer risk and are protective of public health. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

***An inquiry was made regarding the effect of air pollutant emissions from the refinery on mortality in the local population.***

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

***Concerns were expressed regarding the effect of air pollutant emissions from the refinery on the general health of the local population.***

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

***Concerns were expressed regarding the extent to which the National Ambient Air Quality Standards (NAAQS) and Arizona Ambient Air Quality Guidelines (AAAQG) reflect current scientific and medical knowledge about adverse health effects from air pollution.***

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the project proposed by the applicant. The adequacy of the NAAQS and the AAAQG is not a consideration in the permit application review and approval process.

Notwithstanding the above, the NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. These standards and guidelines are periodically reviewed, and revised as necessary, in order to reflect the current state of the science.

### **Odors**

*Concerns were expressed regarding the odors emanating from the proposed refinery and the effects of those odors on the local residents.*

The Department recognizes that the proposed refinery will emit odorous compounds, of which hydrogen sulfide is the primary pollutant of concern. The Department's BACT analysis indicates that the emissions of hydrogen sulfide and other reduced sulfur compounds will be minimized to the greatest extent possible. In addition, the dispersion modeling analyses performed by the Department indicate that ambient impacts of hydrogen sulfide emissions will be acceptable, and the permit (at Section XXIV.B.14 of Attachment "B") requires a network of ambient hydrogen sulfide monitors to ensure that off-site concentrations do not exceed allowable levels. Based on these facts, the Department has concluded that no additional permit terms and no additional research are necessary.

### **Impacts on Soils and Vegetation**

*Concerns were expressed regarding the adequacy of the Department's analysis of the impacts that the refinery's emissions will have on locally grown agricultural crops. Specific concerns were raised with regard to crop losses, human food chain impacts, and danger to livestock.*

Pursuant to A.A.C. R18-2-407(I)(1), an analysis of the potential impacts of air pollutant emissions on soils and vegetation was required as part of the permit application review and approval process for the refinery's air permit. As described in Section VII.B of the Technical Support Document (May 26, 2006), this analysis was performed, and it included a consultation with the Arizona Department of Game and Fish and the U.S. Fish and Wildlife Service, through which no particularly sensitive soil or vegetation resources in the project vicinity were identified. As is customary in these circumstances, the Department relied heavily on U.S. EPA guidance in conducting the soils and vegetation impact analysis. The Department also relied on the secondary National Ambient Air Quality Standards (NAAQS), which are established by U.S. EPA at levels that are protective of the public welfare, including agriculture.

None of these commenters who expressed concerns regarding the soils and vegetation impact analysis identified any specific, scientific bases for their opinions regarding the inadequacy of the Department's analysis. No information was provided that would tend to refute the Department's preliminary conclusion that the refinery's emissions and the environmental impacts of those emissions are acceptable. Nonetheless, in light of the significant value of

agriculture in the Yuma County economy, and the significant number of comments on this issue, the Department performed a supplemental review of soils and vegetation impacts. A copy of the Soils and Vegetation Impacts analysis is available upon request. The review included all air pollutants of concern, not just those covered by the regulatory requirement at A.A.C. R18-2-407(I)(1), and it specifically addressed toxic impacts on plants due to air pollutant exposure; toxic impacts on plants due to deposition of air pollutants onto soils; and human health effects due to uptake of air pollutants by food crops grown on soils near the refinery. This supplemental review confirmed the Department's preliminary conclusion: the refinery's emissions and the environmental impacts of those emissions are acceptable.

### **Visibility Impacts Analysis**

***Concerns were expressed regarding the impacts of air pollutant emissions from the refinery on visibility in the Muggins Mountains Wilderness Area.***

As described in Section VII.B of the Technical Support Document, and as required by A.A.C. R18-2-407(I)(1), the applicant performed an analysis of the impairment to visibility that would occur as a result of air pollutant emissions from the refinery. The results of this analysis showed that, if it is assumed that the all emissions units at the refinery are simultaneously operating at their maximum allowable emission rates, and that this coincides with worst-case meteorological conditions that would be expected to occur less than four days per year, a perceptible plume may exist for a typical observer when viewing the terrain with the sun in front of the observer. Under all other meteorological conditions and for all other viewing angles, but maintaining the assumption that the all emissions units at the refinery are simultaneously operating at their maximum allowable emission rates, the analysis showed that the plume would be imperceptible to the typical observer. In light of the minimal visibility impairment that would occur even under conditions consistent with the very conservative assumptions made in this analysis, the Department has concluded that any visibility impairment that may occur as a result of air pollutant emissions from the refinery will be acceptable.

### **Impacts on Animals**

***Concerns were expressed regarding the effect of air pollutant emissions from the refinery on animals in general, and animal species protected under the Endangered Species Act in particular.***

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis using worst-case meteorological data and the maximum potential emissions from the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS). The NAAQS have been established at levels that are protective of the public health and welfare and are generally viewed by the Department as being sufficiently protective of animal health. In addition, the U.S. Fish and Wildlife Service (FWS) was consulted and was provided emissions data and air quality impacts analysis results. Considering that information, the FWS concluded that no threatened or endangered species or critical habitat would be affected by the refinery project. Based on the results of the Department's analyses, and on the conclusion of the FWS, the Department has concluded that the emissions from the refinery and the environmental effects of those emissions are acceptable.

### **Safety/Security Issues**

***Concerns were expressed regarding emissions from fires, explosions, spills, and other emergency releases at the refinery.***

The effects of emergency releases are not a consideration in the air permit application review and approval process. However, the permit does require that the refinery comply with applicable provisions of the Accidental Release Prevention regulations adopted by U.S. EPA pursuant to § 112(r) of the federal Clean Air Act. These regulations require that the facility take into consideration the proximity of residences, schools, hospitals, prisons, parks and recreational areas, and offices when developing the hazard assessment mandated by the regulations. In addition, the refinery will be required to comply with the Oil Pollution Prevention regulations adopted by U.S. EPA pursuant to the Clean Water Act and the Oil Pollution Act. These regulations require that the facility prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan and a Facility Response Plan (FRP) in order to prevent and minimize the effects of oil spills.

***Concerns were expressed regarding the safety implications of building the refinery near an interstate highway and railroad tracks.***

Highway and railroad safety issues are not considerations in the air permit review and approval process. However, the permit does require that the refinery comply with applicable provisions of the Accidental Release Prevention regulations adopted by U.S. EPA pursuant to § 112(r) of the federal Clean Air Act. These regulations require that the facility take into consideration the proximity of the highway and railroad tracks in developing and implementing the hazard assessment, management system, prevention program, and emergency response program mandated by the regulations.

### **Enforcement Issues**

***Concerns were expressed regarding the qualifications and capabilities of the Department's enforcement personnel.***

The Department understands that the focus of these concerns was that the Department has no experience regulating petroleum refineries. The Department's analysis has determined that three additional enforcement personnel will be required in order for the Department to adequately regulate the Arizona Clean Fuels facility. The Department will have these personnel in place and trained by the time that the refinery has been constructed. The Department will work with other state and local agencies that have experience regulating petroleum refineries in order to train the enforcement personnel who will oversee the refinery operations.

### **Support for Permit Issuance**

***Support was expressed for issuance of the air permit.***

The comments are acknowledged.

### **Miscellaneous Comments**

***One commenter suggested that the permit should not be issued because the Permittee does not own the land on which the proposed refinery will be located.***

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the site proposed by the applicant. Ownership of land is not a consideration in the air permit application review and approval process.

***Concerns were expressed regarding emissions during startups, shutdowns, and upsets. One commenter also asserted that the permit does not place limits on the number or duration of these events.***

To the extent that events described by the commenter might result in emissions in excess of any applicable emission limitation or standard, those upset events and excess emissions are covered by Section XII of Attachment "A" to the refinery's air permit. By definition, these excess emissions events constitute permit deviations, and do not go unregulated. All permit deviations are required to be reported to the Department within two working days of the time that the deviation occurred, or within two working days of first learning of the deviation, as stated in Condition XII.B of Attachment "A". This report is required to include the information regarding the probable cause of the deviations, and any corrective actions or preventative measures that were taken by the source in order to mitigate the deviation.

According to Section XII of Attachment "A", emissions in excess of applicable emissions limitations due to malfunction, startup or shutdown shall constitute a violation of the permit. The conditions of this Section of the permit do provide the source with an affirmative defense against civil or administrative enforcement that might proceed from such a violation, but only if the permittee complies with the reporting requirements in Section XII, and has successfully demonstrated the following:

For Malfunctions:

1. The excess emissions resulted from a sudden and unavoidable breakdown of process equipment, or air pollution control equipment beyond the reasonable control of the operator;
2. The air pollution control equipment, process equipment or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;
3. If repairs were required, the repairs were made in an expeditious fashion when the applicable emission limitations were being exceeded. This could include the use of off-shift labor and overtime, unless the permittee can prove that such measures were impracticable;
4. The amount and duration of the excess emissions (including any bypass operation) were minimized to the maximum extent practicable during the emissions event;
5. All reasonable steps were taken to minimize the impact of the excess emissions on ambient air quality;

6. The excess emissions were not part of a recurring pattern that is indicative of inadequate design, operation, or maintenance;
7. There were no exceedances of the relevant National Ambient Air Quality Standards that could be attributed to the emitting source;
8. The excess emissions did not stem from any activity or event that could have been reasonably foreseen and avoided, or planned, and could not have been avoided by better operations and maintenance practices;
9. All emissions monitoring systems were kept in operation if at all practicable; and
10. The Permittee's actions in response to the excess emissions event were documented by contemporaneous records.

For Start-up and Shutdown:

1. The excess emissions could not have been prevented through careful and prudent planning and design;
2. If the excess emissions were the result of a bypass of control equipment, the bypass was unavoidable to prevent the loss of life, personal injury, or severe damage to air pollution control equipment, production equipment or other property;
3. The Permittee's air pollution control equipment, process equipment or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;
4. The amount and duration of the excess emissions (including bypass operations) were minimized to the maximum extent practicable during periods of such emissions;
5. All reasonable steps were taken to minimize the impacts of the excess emissions on ambient air quality;
6. During the period of excess emissions there were no exceedances of the relevant National Ambient Air Quality Standards that could be attributed to the source;
7. All emissions monitoring systems were kept in operation if at all practicable; and
8. The Permittee's actions in response to the excess emissions event were documented by contemporaneous records.

Upon receipt of any permit deviation report, the Technical Services Unit of the Air Quality Compliance Section will review the report and supporting information. If the permittee fails to prove that it has an affirmative defense for the excess emissions event, or if it is determined that the excess emissions event does not qualify for affirmative defense, the Air Quality Compliance Section will follow the guidelines set forth in the Department's Compliance and Enforcement Handbook to ensure that the appropriate actions are taken against the permittee for violating the conditions of its permit.