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5/1/86

EPA 550/4-79-103 Annoyance, Loudness, and
Measurements of Repetitive Type Impulsive
Noise Sources

(Prepared by L.C. Sutherland and R.E. Burke, Wyle Research)

In summary, impulsive ~~sounds~~ noises tend to
stimulate subjective response of annoyance or loudness
perception equivalent to ~~5 to 10 dB above~~ continuous
steady noise 5 to 10 dB (or more) higher in L_{eq} than
the ~~avg~~ measured (or calculated) L_{eq} of the impulsive noises.

A ~~ten~~ average correction factor of +7 dB is suggested
to account for this greater noisiness.

(It is to be noted that one test involving
helicopter blade slaps for real helicopters ^{flights} showed a smaller
correction factor than other test series. The general result
now suggests ^{average} a correction ^{for blade slaps} of about 3 dB. A
hypothesized explanation is that the long duration of the
helicopter flyby tended to mask the impulse correction
factor. It also may be possible that, in the test showing
the smallest correction factor, the ^{degree} of blade slap
was light or moderate, thus minimizing the blade slap
contribution.)

Federal Aviation Administration
Office of the Chief Counsel
Attn: Rules Docket (AOC-204)
800 Independence Ave, SW
Washington, D.C. 20541

Subject: Comments on Proposed Noise Standards for Helicopters,
14CFR Part 36 [Docket No. 24929; Notice No. 86-3]

Gentlemen:

The Environmental Protection Agency ^(EPA) has reviewed the subject Proposed rulemaking, and submits the comments in the subsequent paragraphs.

The EPA strongly concurs in the ~~desirability~~ ^{stated} objectives of the Federal Aviation Administration (FAA) that it is "necessary to provide current and future relief and protection to the public health and welfare from the noise of ~~affected~~ ... helicopters."

We regretfully conclude, however, that it does not appear that the proposed noise standards for helicopters, ~~as currently drafted~~ ^{as promulgated}, ~~will be a significant~~ ^{will be a significant} step toward achieving that objective. The reasons for this conclusion are summarized below:

1. The proposed rule, ~~by allowing~~ "Stage 1" helicopters (i.e., those that are ~~so~~ ^{too} noisy that they ~~to~~ ^{cannot} comply with the proposed standards) to continue to be produced after the effective date of the final rule, limited only ~~by~~ ^{to} the extent that they may not become noisier. This provision will ensure that ~~noisy~~ ^{excessively} helicopters continue to be introduced into the fleet.

2. The proposed new standard (for "Stage 2" helicopters) sets a noise limit identical to the ICAO noise limit for helicopters set by the International Civil Aviation Organization (ICAO). These limits appear to have been set to allow all the aircraft in ICAO Data Base 1 (1977 data) to ~~meet~~ ^{comply}, based on data

presented in FAA Report No. FAA-EE-86-01 of March 1986, "Analysis of Helicopter Noise Data Using International Helicopter Noise Certification Test Procedures." The first paragraph of Section 3.1 of this report points out that the current ICAO noise standard "... is essentially an 'umbrella' standard established primarily to insure that future helicopter designs are not substantially noisier than older models which essentially meet this standard." (our underlining)

We suggest that ~~as~~ a standard based on such a criterion cannot be expected to provide either relief or protection of the public health and welfare from the noise of helicopters.

3. The referenced FAA report provides acoustical data on seven helicopters tested under a so-called "Rainbow" series of tests. These aircraft presumably are of fairly modern design and construction. The ~~results~~ results of the test series are summarized in the accompanying table.

| Helicopter No. | Margin below ICAO Noise Limit | | | Statistical Mean |
|------------------|-------------------------------|------|----------|------------------|
| | Take off | LFO | Approach | |
| 1 | 7 | 7.1 | 5.5 | 6.5 |
| 2 | 5.5 | 7 | 4.2 | 5.6 |
| 3 | 6 | 6.2 | 3 | 5.1 |
| 4 | 6.3 | 4.9 | 2.5 | 4.6 |
| 5 | 3 | 5.7 | 2.3 | 3.7 |
| 6 | 5.5 | 7.9 | 4.5 | 6.0 |
| 7 | 10 | 9.2 | 5 | 8.1 |
| O.A. Avg. | 6.2 | 6.9 | 3.9 | 5.7 |
| σ _{n-1} | 1.94 | 1.43 | 1.26 | 1.42 |

Comparison of these results with the ICAO limits (as provided in the proposed rule) reveals that the seven aircraft as a group are better than 5 decibels (dB) below the limits. For the worst condition, Approach, the group averages almost 4 dB better; ~~since the~~ and for the worst aircraft, the mean noise level for the three conditions is 3.7 dB better than the proposed limits.

It may reasonably be inferred from these figures that application of modern technology readily to new the design and construction of new helicopter models would readily better the proposed FAA (and present ICAO) noise limits by at least 3 decibels, and ^a5 decibels superiority is not out of the question. Consequently, the proposed limits would appear to provide little incentive for manufacturers to develop and produce quieter helicopters that might result in genuine relief and protection to the public health and ^{future} welfare.

The Agency recognizes that technological feasibility is not the only factor that the FAA must consider in promulgating ~~new~~ new noise regulations for aircraft, including helicopters. Further, the EPA has neither the expertise nor the resources to properly assess the relative importance of the economic and international policy aspects of ~~aircraft~~ rulemaking on aircraft noise, versus the technological technology aspects. Consequently, the Agency does not now recommend that the proposed limits be ~~set~~ made significantly (or at all) more severe than the ICAO limits.

However, the Agency does take the position that the FAA should be more forthcoming in describing the relatively modest ^{anticipated} effects of its proposed rule on the ~~helicopter noise~~ ^{helicopter noise} ~~article~~ helicopter noise ~~to be expected~~ in the community environment of its future. Further, the Agency believes that communities and jurisdictions faced with ~~helicopter~~ increased ~~transit~~ transit of helicopters into and over their airspace and local environment should be encouraged - or at least allowed - to establish noise exposure limits in the vicinity of local heliports and helicopter flyways. Such limits should be consonant with local noise limits for noise exposure based on appropriate zoning considerations.

For example, a community might set a limit of 55 decibels as the ~~cont~~ allowable contribution of helicopter noise to the prevailing day-night average noise level (L_{dn}). Alternatively, if the community might limit the increase in prevailing L_{dn} in the vicinity to some stated (small) fraction of a decibel. The foregoing is suggested in the light of the stated operational goals of the EPA booklet "Noise: Toward a National Strategy for Noise Control"; the pertinent goals relevant to this discussion are:

- "C. To reduce (environmental) noise exposure levels to (L_{dn} = 65 dB) by vigorous regulatory and planning actions;
- D. To strive for an eventual reduction of (environmental) noise (exposure) levels to (L_{dn} = 55 dB);"

Sincerely

S / (Gog?)

2.3 RESPONSES TO COMMENTS FROM

Environmental Protection Agency, 3 August 1984

CODE: EPA

2.3 U.S. Environmental Protection Agency

OK A.1 Comment noted.

A.2(1) Greater detail has been provided regarding the feasibility and possible mechanism of implementation of the mitigation measures.

Implementation of mitigation measures will be the responsibility of the appropriate regulatory agencies. The purpose of the DEIR/EIS is to describe impacts and present a list of potential mitigation measures. The EIR/EIS is not intended to be the vehicle to implement the mitigation measures. It is the responsibility of the regulatory agencies in their staff reports and record of decision documents to identify mitigations which will be implemented and enforced.

If the agencies determine that violations may result from the project, as required by both State and Federal regulations, the agencies will require DACT and offsets as appropriate to reduce impacts to a permissible level. Such determination or commitment to require such mitigation is not the intent of an EIR or EIS document. Mitigations, if adopted, would be enforced (1), by MMS, for the offshore platform through frequent inspections and by requiring submission of monthly emissions inventories, (2) by the APCD, for the onshore facilities by spot checks and reporting as necessary.

OK A.2(2) Agencies responsible for requiring and implementing each of the mitigations have been identified in the revised Impact Summary Tables. These tables were mailed to 40 interested agencies for input and have been revised to reflect the comments of those who responded.

OK A.2(3) The DEIR/EIS has been revised to reflect the mechanisms which would be employed to implement given measures (wherever possible.) In addition, the Joint Review Panel intends to communicate during the preparation of their agencies' staff reports and recommendations to ensure consistency and thoroughness.

OK A.2(4) Federal process: See response A.2(1). CEQ Regulations Section 1505.2 require that the MMS Record of Decision document include the rationale for adoption or non-adoption of each measure and a summary of each monitoring and enforcement program. This discussion of the Federal Record of Decision document will be added to Chapter 1 in the FEIR/EIS. MMS will provide enforcement through frequent onsite inspections and reporting procedures.

State process: The State Lands Commission can incorporate specific conditions into its leases for the appropriate project components. This may include specific requirements of other permitting agencies.

Handwritten notes:
11-11-81
1505.2
mitigation
measures
for any other
sectors like
electricity

County process: The initial County permit decisions will include specific conditions on the Preliminary Development Plan. The applicant then incorporates the conditions into their project design (where applicable) and describes how other non-technical mitigations will be implemented. Once the County is satisfied that all conditions have been addressed, the County will approve the Final Development Plan. Currently, the County's enforcement capabilities are limited to site inspections by the Health Department, Department of Public Works (Building & Safety), Air Pollution Control District, and possibly others arranged as part of the permit approval.

Section 1.5 of the EIR/EIS provides additional information on how agencies will use this document.

OK B.1

Comment noted.

B.2

Exceedance of DOI significance levels is only one of several criteria used to judge whether an impact is "significant" for the purposes of this document. In the case described, "significance" did not relate to DOI regulated significance levels. The preliminary determination made by MMS under the DOI regulations is that NO_x and HC emissions resulting from cumulative, project-related activities will not exceed the DOI significance levels. DOI regulations would not require additional controls for off-shore sources unless significance levels are found to be exceeded.

OK

OK B.3

See response to EPA A.2 (1) above.

Probably not by that Reg 4 (Also has SO₂)

B.4

Graphic representation of impacts from NO_x are presented in Appendix F on pages 149-170. The illustrations show that the high pollutant concentrations are confined to areas of elevated terrain within a few kilometers from the source. Concentration will be greatest at the approximate elevation of the effective plume height. At all other elevations, concentrations will be considerably lower.

What about SO₂ PSD treatment circumstances and traffic PSD increase? Show realistic water injection?

B.5

In the DEIS the use of water injection for the platform turbines was treated as normal control operations, because both Chevron and Texaco committed to this as part of their application submission.

The water injection scenarios showed significant ozone impacts in the modeling analysis was report in the EIS/R. In the Air Quality Technical Appendix Section 10.6.5 the impacts of platform emissions without water injection were treated as a model sensitivity run. The results showed that without water injection the peak ozone level would increase by .01 ppm. Thus, a mitigation measure proposing the use of power lines from shore was analyzed. It is difficult to assess specific emissions tradeoffs for the utility grid scenario. Because of the complexity of the grid system, one cannot determine the specific sources of the power. There are a number of power plants in the

*Should have
discussed a unit of
cost + production*

system, including nuclear, that could be used. However, most of the power plants are running well below permitted capacity and could supply the needed platform power without causing increased emissions. *without exceeding permitted capacity?*

B.6 In the Project Emissions Estimates portion of Section 5.2.1 of the DEIS/EIR it is stated that all identified sources with emission rates, durations and likelihoods of simultaneous occurrences were included in the analysis. This included tugboats and supply boats servicing the platforms during installation and production. Section 6.2 of the DEIS/EIR states that future population growth induced by the oil activities would not be large in Santa Barbara County and that additional emissions from increased traffic and from other population-dependent sources would not be significant.

*What about
onshore product
transportation
emissions?*

B.7 Presently the monitoring stations in Santa Barbara County are sparse, especially near Pt. Conception and Pt. Arguello. Monitoring stations in the future will increase as applicants are required to conduct preconstruction monitoring for PSD review.

Existing monitoring stations have been sited to collectively provide a comprehensive indication of air qualities within rural, urban, inland and coastal settings. Funding constraints have reduced the number of long-term operating sites, but new regulations (Santa Barbara County APCD Rule 205.C) require 12 months of pre-construction on-site air quality monitoring before permit applications will be processed. It is hoped that the new monitoring requirements will greatly improve the air quality data for this region. Additional information can be obtained by contacting the Santa Barbara County Air Pollution Control District.

C.1 Data Gaps

The data gaps are discussed in summary form in Part 5 of Appendix H (last 4 pages of Appendix H). The EIR/EIS acknowledges that this information could make the analysis more precise, but its unavailability does not preclude a reasonably accurate impact assessment. The EIR/EIS discussions appropriately emphasize analysis based on existing information.

C.2 Produced Waters

Identified mitigating measures that involved treatment of Gaviota discharges included: (1) aeration of the scrubber water (for sulfite oxidation); (2) lagooning, activated sludge or other biological treatment of the produced water for COD and BOD removal; and (23) aeration or stripping of the produced water for ammonia removal. Such processes (if properly designed, built and operated) are capable of adequately treating the discharges and meeting the limits of the California Ocean Plan; the impacts are thus appropriately considered as Class II.

C.3 Marine Water Quality

The lack of desired baseline data was described and recommendations made for filling these data gaps. The data gaps do not pertain to what (under NEPA) is considered "essential" information, and thus worst case scenarios (for impact analysis) are not necessary.

The comment further suggests extending the analogy between possible project discharges and municipal discharges into the Southern California Bight. (See p. H-67 of Appendix H.) Any further extension of this analogy is deemed unnecessary, and - if undertaken - would have to be very carefully defined and described to avoid unfair comparisons.

We are unaware of any published reports that have described the known marine water quality impacts resulting from current oil and gas operations in the Santa Barbara Basin. The MMS is currently funding studies which are designed to monitor the effects of platform discharge associated with the area study development.

C.4 Sodium Hydroxide (NaOH)

We would expect no significant water quality impacts (including excessive pH changes) due to the discharge of NaOH in the drilling fluids. Therefore, detailed analysis of this potential is not crucial for project decision making. (See Appendix H, p. H-16, for further discussion.)

C.5 Protection of Hard-Bottom Communities

Comment noted.

C.6 Groundwater

Discharged desalination brine, by itself is expected to be diluted sufficiently to comply with state Regional Water Quality Control Board standards. If this discharge is mixed with the other wastewaters, the density of the latter will be increased, and the discharge plume will be slightly less buoyant. This will affect the trajectory of the discharge plume and the initial dilution factor. Even if accurate data on the temperature, salinity and flow rate of this discharged brine were available, it might not be possible to reliably predict the effect on the discharge plume (trajectory and dilution) because of the difficulties in modeling such discharges.

The proposed desalination facility was described in Technical Appendix G of the DEIS. Section 5.2 of this response document, responses to Citizens Planning Association of Santa Barbara County, Inc.

C.7 Correction of Depth to 200 m

Correction made in text.

- D.1 The use of the Southern Pacific ROW was discussed at length in the course of the study. The greatest difficulties with this alternative are the degree of erosion threatening the existing ROW for the immediate future and over the next 50 years, and the need to replace existing trestle crossings of stream mouths at Alegria and Agua Caliente. Renovation of the RR tressels for use by pipelines would create a larger terrestrial/lagoon zone of disturbance. The use of this ROW would incur greater greater risk of accidents, including gas line rupture and oil spills near the intertidal zone and lagoons. The realignments and spanning proposed in table 5.6.1 of the DEIS were designed to avoid high value biological features and minimize impacts on wetlands and coastal lagoons. An old Texaco line on Hollister Ranch that spans creeks has shown that such an approach has merit, and remains the preferred mitigation for stream crossings at steep slope areas.

The removal of butterfly trees which would occur with clearing the Gaviota site for the processing facility and proposed access roads, appears unavoidable if the project is approved. Offsite compensation is the only potential mitigation but the feasibility of this is questionable as butterfly tree locations normally have characteristics which are very specific to the insects' needs. Alternative sites analyzed to date have total adverse impacts that would likely be equal to or worse than those at Gaviota.

- D.2 Response to comments on access roads and maintenance

The applicant indicates that existing roads and the 100 foot pipeline ROW are all the area required for this project. They have said that there will be no need for new access roads for maintenance, and that there will be no ROW or pipeline maintenance with the use of pesticides or other clearing methods.

- D.3 Response to comments on pipeline corridor revegetation

Oak woodlands and high value riparian areas, especially where revegetation will be a problem, should be avoided. The applicant has submitted a revegetation plan (see Chevron Comment #204 and ADL's response). The species suggested by Chevron's consultant would adequately revegetate most areas that would be crossed by the pipeline. However, woodlands and steep slopes would be permanently altered above and adjacent to the pipeline unless the pipeline route is relocated to avoid such areas as suggested in Table 5.6.1, section 5.6.5, and section 5.3, of the EIR/S. Without these, or very similar measures not yet proposed, impacts to biologically sensitive areas will be significant.

The text of the FEIR/EIS has been changed to reflect the need to have erosion control structures in place prior to the beginning of construction, compaction and revegetation to be part of an ongoing program to follow as each section of pipeline is laid; and placement and/or securing of spoil piles to be such that sudden rainfall will not wash them into streams. See Section 5.6.

- D.4 The area around Gaviota is noted for species diversity. At low elevations and on steep shale slopes, coastal sage scrub is scattered, with grassland confined primarily to the heavier soils of the coastal plain. The slopes behind Gaviota are covered primarily by chaparral vegetation. Dominant shrubs would include: Chamise (Adenostoma fasciculatum), big-pod ceanothus (Ceanothus megacarpus), hairy ceanothus (Ceanothus oliganthus), green bark (Ceanothus spinosus), Refugio manzanita (Arctostaphylos refugioensis), bush poppy (Dendromecon rigida), chaparral currant (Ribes malvaceum), bitter gooseberry (Ribes amarum, var hofmannii), among others. These communities are fire-adapted and fire-dependent.

A number of rare and/or declining species are thought to be in the Gaviota area. The following rare and/or endangered species (based on the 1982 CNPS List) might be found:

Arctostaphylos refugioensis
Baccharis plummerae
Calochortus catalinae (removed from list in 1984)
Chorizanthe wheeleri
Calcium cliftonsmithii
Polygala cornuta subs pollardii
Sanicula hoffmannii
Solanum xanti, var hoffmannii

Impacts of high SO₂ levels from sulfur plant failure could impact an area of the hills behind the site in the range of 100-1000 acres.

It is assumed that the larger the area, the more dilute the SO₂ concentrations. The maximum impacts would occur in a localized area approximately 300 meters north of the facility and covering approximately 60 acres.

The maximum levels could be as high as 10 to 20 times the short-term Federal SO₂ standards under upset conditions. At this date, Chevron has not² proposed fire breaks for the perimeter of the Gaviota Facility, but the County Fire Department may require fire breaks of an as yet undetermined width.

D.5 Response to EPA Comment 5: Growth Inducing Impacts

The text has been modified with general reference to secondary impacts due to cumulative projects induced population growth impacts on habitat loss. Without specific plans, it is difficult

to project the specific nature of habitat loss or extent. One can only point out its likelihood for the purpose of providing lead time to allow preparation of plans that could minimize such impacts. The nature of the Santa Barbara area makes transfers of experience from other offshore development locations, e.g., Gulf Coast, unlikely to be relevant.

E.1 The Final EIR/EIS will be reused to include discussion of the role of the Pacific Strike Team, USCG Strike Team and limitations of the clean-up equipment due to weather conditions. Ongoing evaluation of equipment is made by MMS and USCG with each application. Additional equipment namely, the onsite response vessel, has been proposed by Chevron/Texaco to address the needs of this project.

E.2 Offshore Pipeline Alternative

The EIR/S text of sections 4.5 and 5.5 have been expanded to enable a more detailed comparison of the offshore habitats affected by the Platform Hermosa to Gaviota alternative.

NPDES PERMIT COMMENTS

F.1(a) Maximum Concentration of Trace Metals

Comment on table 5.4.17 acknowledged.

F.1(b) Limit on Oil and Grease Concentration

The regulations published in the FEDERAL REGISTER on Dec. 8, 1983 (p. 55029) say that the oil and grease limit is applicable after initial dilution, i.e., the 72 mg/L limit is not an end-of-pipe limit.

F.1(c) Editorial Comment: "General Permit"

Correction made to text on p. 5.4-3.

F.2 Review Suggested of Prior/Existing OCS Operations

Available literature studies of the sizes of areas affected by both explorative and development drilling were reviewed for this EIR/S (See Literature Cited in Appendices H and I).

An original field study as suggested would be of interest, but is beyond the scope and budget for this EIS.

F.3 Specification of Discharges Modeled

Subheadings have been added to the text on p. 5.4-2 to clarify that the modeling focused on discharges other than drill fluids; details are provided in Appendix H, Part 1, p. 33. The comment correctly points out that the dilution factor assumed for the

calculations shown in Table 5.4-21 of Appendix H is probably significantly larger than might be expected for dilution at the edge of a mixing zone (unless the discharge contained a large component of once-through cooling water).

F.4 Iron as a Potentially Significant Pollutant

Data on produced water from the Buccaneer Field (cited by C.A. Menzie, ENVIRON. SCI. TECHNOL., 16(8): 454A-472A, 1982) indicated that iron would be present at up to 1.9 mg/L, and that this concentration exceeded the concentration in seawater by a factor of 560-2340. While there are no State or Federal Water quality standards for iron in seawater, the National Academy of Sciences did state, in 1972, that a marine water concentration of 0.3 mg/L might be hazardous to aquatic life (see Appendix H, Par 4, p. 10 for details and reference).

F.5 Drilling Muds and Metals

We do not believe this represents an inconsistency between the DEIS and the Technical Appendix (H) on this issue, as both say essentially the same thing about the significance of any metal increases that may be observable. The comment correctly points out that there is a potential for some metals (e.g., Ba, Cr) to increase in relation to natural concentrations.

F.6 Toxic Organics

Comment noted. Some of these compounds merit closer attention and, if the identified monitoring programs (including effluent monitoring) are undertaken, effluent data would be useful for predictive modeling on future projects. Based upon data from other oil fields, it appears that the expected initial dilution will lower concentrations of chemicals such as benzene to values below those considered to be of concern (e.g., for benzene 5.1 mg/L for acute effects and 0.7 mg/L for chronic effects - per Table 4 in Part 4 of Appendix H).

F.7 Onshore vs Offshore Facility

The Gaviota processing facility will be located onshore; as such, it can be referred to as an "onshore" facility. It is acknowledged that the facility would fall into EPA's "offshore" discharge category, but it is worth noting that it will discharge into a nearshore receiving environment.