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4 BEFORE THE STATE OF WASHINGTON
5 ENERGY FACILITY SITE EVALUATION COUNCIL

6 In the Matter of)
7 Application No. 99-1) EXHIBIT _____ (DML-T)
8 SUMAS ENERGY 2, INC.)
9 SUMAS ENERGY 2 GENERATION)
10 FACILITY)
_____)

11
12 WHATCOM COUNTY ' S PREFILED TESTIMONY
13 WITNESS # _____ : David M. Lipscomb, Ph.D

14 Q: Please introduce yourself to the Council.

15 Ans: My name is David M. Lipscomb. I hold a Ph. D. in Hearing Science earned in 1966 from
16 the University of Washington, Seattle. I am a visiting professor in the Department of
17 Communicative Science and Disorders, at Western Washington University, Bellingham,
18 Washington. I am a Consulting Audiologist and President of Correct Service, Inc. which is based
19 in Stanwood, Washington. I have more than three decades of experience in the laboratory study
20 of noise and its effects upon the ear; sound measurement and analysis; determination of
21 adequacy of warning sounds in their alerting capability; and I have extensive experience in
22 pertinent application of psychoacoustical principles regarding human reaction to environmental
23 sound. To further underscore my background, experience and training applicable to this case, a
24 copy of my curriculum is attached to this report (*see*, Exhibit DML-1). In the early stages of
25 Federal Governmental activity pertaining to noise in the environment, I served during the
summers of 1973, 1974 and 1975 as a Bioacoustician for the U. S. Environmental Protection
Agency, Office of Noise Abatement and Control. In that capacity, I participated in generating
the Noise Criteria Document (Published July, 1973) and as a technical reviewer of the Levels
Document (Published March, 1974). These documents formed the foundation for many of the
factors under consideration in this action, and, incidentally, are cited in the DEIS. My
professional and consulting activities have included the evaluation of community noise and

1 consulting with various jurisdictions at the local, county, state and national level concerning
2 various questions regarding noise in the environment.

3 Q: What are the subjects of your testimony?

4 Ans: I will discuss acoustical and psychoacoustical parameters attendant to the noise generated
5 presently at the Sumas Generating Plant. Further, I will comment upon the acoustical predictions
6 for noise levels projected for the expanded (SE2) facility. I will then discuss the unique
7 problems concerned with the noise broadcast from the Power Generation Plant with respect to
8 the intensity of low-frequency noise. Particularly, I will describe how the shells of buildings are
9 hardly a barrier to such low pitched sound.

10 Q: What information related to this particular project have you reviewed to date?

11 Ans: I have reviewed Section 4.1 and the related data tables (Appendix B) of the Sumas
12 Energy 2 Application; Section 3.3 of the DEIS, and certain data which was made available to me
13 compiled by Petur Sim of Whatcom County.

14 Q: Did the information give you cause for concern?

15 Ans: Yes, I noted that the anticipated sound emissions from the new facility are conservatively
16 predicted to increase 2 to 4 dBA. Based on my review of the project information, I would expect
17 to see a greater increase than that projection.

18 Q: Why does this fact concern you?

19 Ans: The present day sound levels contain intense low-pitch sound energy. The low frequency
20 components of this industrial noise penetrate buildings, such as homes, with very little loss of
21 sound energy. This can be seen in the data compiled by Mr. Sim which compared exterior and
22 interior sound levels, with windows opened and closed, using C-weighted and A-weighted
23 measurements taken recently at two locations near the project site (described as the Jager
24 "farmhouse" and "residence" by Mr. Sim). The present day measured sound levels frequently
25 exceed those that are recommended for an adequate sleep environment. For example, Dr. Leo
Beranek's noise criterion data (L. Beranek, Noise Reduction, McGraw-Hill, 1960, cf. pg. 523)
suggests that noise levels in sleeping areas should not exceed 45 dBA (*see*, Exhibit DML-2). To
increase these levels would worsen an already unfortunate environmental condition. In fact, the
data suggests that the expected sound increase would be akin to the difference in sound level
which one might currently experience in opening a closed window in a nearby residence.

Q: Are you familiar with the effects of noise on public health?

Ans: Yes. In addition to my work with the U. S. EPA, I have attended and made presentations
to numerous International Congresses on Noise as a Public Health Problem. They include 1968
(Washington, D.C.); 1973 (Dubrovnic, Yugoslavia); 1978 (Friburg, Germany) and 1982 (Turin,

1 Italy). These were gatherings of active researchers on the topic from around the world.
2 Proceedings of the Congresses were produced and are contained in my library.

3 Q: Could you describe some of these effects?

4 Ans: Yes. The effects include loss of sleep, hearing damage, irritability, exacerbation of
5 nervous and cardiovascular disorders, and frustration stemming from loss of control of one's
6 acoustical environment.

6 Q: Is a person able to control the physical reaction within their body to sound?

7 Ans: Only to a limited extent. Dr. Samuel Rosen, formerly physician at New York City's Mt.
8 Sinai Hospital stated: "You may be able to ignore noise – but your body will never forgive you."
9 The truth in this statement is that "coping" is a fatiguing activity. Therefore, the energy spent in
10 coping with environmental noise or the frustrations it produces, is robbed from energy desired
11 for other forms of activity.

10 Q: At what sound levels would you expect to see reactions of effects of noise?

11 Ans: Surprisingly small sound levels can cause certain reactions. For example, sleep studies
12 have shown that subjects will shift two or three levels of sleep when the environmental sound is
13 increased only 5 dB. Thus, a person in the Rapid Eye Movement (REM), the fifth stage of sleep,
14 when the bedroom sound level is 35 dBA, will shift out of that essential level of sleep when the
15 sound increases only to about 40 dBA. As a result, this negative health effect is known to lead to
16 chronic fatigue and irritability.

15 Q: Could you please explain the effect of noise at night in residential areas?

16 Ans: Yes, recall that I mentioned low-frequency noise entering a house almost unimpeded. If
17 that noise source is the predominant sound in a bedroom, any change in the sound level can
18 influence a person's sleep level, therefore, reducing the adequacy of rest afforded by sleep.
19 Further, the noise source, if it is from the power generation plant, serves as a masking noise.
20 That is, it covers up other sounds to which one may need to attend. For example, sounds from a
21 child's bedroom.

20 Q: Could you please explain the effect of low frequency noise and how it travels?

21 Ans: Yes, but to do so, I must introduce the term "wave length". This is the distance covered
22 by a sound during one cycle. For example, a mid-frequency 1000 Hz sound has a wave length of
23 slightly more than 1-foot. Lower frequency sounds have longer wave lengths. Thus, a 100 Hz
24 sound has slightly more than a 10-foot wave length. The longer the wave length, the more
25 efficient the sound is in penetrating barriers such as walls of a structure. For the purposes of this
investigation, I would define low frequency sounds as those falling below 100 Hz. Perhaps you
have experienced life in an apartment when a neighbor plays a stereo loudly. The sound that

1 penetrated to your quarters was the bass (low frequency sound). Also due to the wave length
2 characteristics, low frequency sounds dissipate less over distance than do sounds of higher
3 frequency. I noted that some of the lowest frequency sounds in parts of the power plant were
4 nearly 130 dB. That means that these intense low pitched sound stimuli are reaching out great
5 distances beyond the boundaries of the power plant. A concern which the Council should
6 address.

7 Q: Is there a difference in effects between noise that is experienced occasionally and noise
8 that is constant?

9 Ans: Yes, there are several features that distinguish constant and intermittent noise. Some
10 intermittent noises can be alerting or aggravating due to the sudden occurrence of the sound.
11 These are infrequent, therefore, they are more easily accommodated. Constant low level, but
12 bothersome sound, is much like a slight headache or slight toothache. Eventually, one will go to
13 just about any length to eradicate the source of such discomfort.

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END OF TESTIMONY

I declare under penalty of perjury that the above testimony is true and correct to the best of
my knowledge.

Executed at _____, Washington, on this _____ day of June, 2000.

By: _____
David M. Lipscomb