

# **Kwinana International Motorplex**

---

**Western Australian Sports Centre Trust**

**Advice to the Western Australian Planning Commission  
in accordance with section 16(j) of the  
Environmental Protection Act**

ISBN. 0 7309 8156 8  
ISSN. 1030 - 0120

# Contents

05

	<b>Page</b>
<b>1. Introduction</b>	<b>1</b>
<b>2. Societal Risk</b>	<b>1</b>
<b>3. Land Use</b>	<b>3</b>
<b>4. Overall Summary</b>	<b>3</b>
<b>5. References</b>	<b>4</b>

## 1. Introduction

This report is submitted under section 16(j) of the Environmental Protection Act as an input to the land use decision-making process of the Western Australian Planning Commission in relation to a proposal by the Western Australian Sports Centre Trust to build and operate a motorsport facility (Motorplex) in the Kwinana area.

The matters covered in this report are societal risk and land use.

## 2. Societal Risk

The Kwinana Industrial Area (KIA) includes a number of industries which store or process hazardous materials, and even with the best environmental practices, there is always a risk of an industrial accident. In the event of such an accident the Motorplex site could be subject to impacts by hazardous gases, extreme heat, overpressure or falling debris capable of causing multiple fatalities or injuries. Such impacts could occur in less than ten minutes from the time of the accident. Industries provide their workers with protective clothing, respirators and safe refuges to protect them from the consequences of such accidents.

There are two aspects of risk which need to be considered in the context of this proposal:

*Individual Risk* is a measure of the chance per year that any one member of the public will be killed as a result of an accident.

*Societal Risk* is a measure of the chance of a number of people, or more, being killed as a result of an accident (this is generally defined as a curve referred to as a Frequency - Number (F-N) curve).

The EPA has addressed the issue of individual risk in its assessment of the proposal in accordance with Section 44 of the *Environmental Protection Act*, (Bulletin 948).

In relation to societal risk, EPA adopted the position that the issue is largely a planning matter and that it would not formally assess societal risk provided that the proponent made available to the public an adequate document addressing the issue, including emergency response.

The proponent issued a report on societal risk (ERM, 1999b) which also included a brief discussion of emergency response plans. In preparing the societal risk report, the proponent has used previous risk studies and data for the KIA undertaken by AEA Technology (AEA, 1995 and 1998), and a report by Environmental Risk Solutions (ERS, 1999).

The EPA sought a "peer review" of the proponent's societal risk report to ascertain whether it adequately addressed the technical aspects of risk to Motorplex patrons and whether the conclusions reached could be justified.

The peer review (DNV, 1999) considered that the societal risk report significantly underestimated the level of risk associated with the proposed Motorplex site for a number of reasons. These included:

- the cumulative risk studies (AEA, 1995 and 1998) upon which the societal risk report was based, focussed on existing residential populations and 'far field' scenarios, and therefore did not take into account a number of scenarios which could affect the Motorplex site which is closer to industry;
- the KIA has developed since the AEA 1995 study, now having new hazardous plants and an increased number of hazardous operations;
- the report did not take account of a significant increase in the transport of dangerous goods by nearby road, rail and pipeline since the 1995 study;
- site-specific risks such as the prevailing winds during summer evenings when most of the motor sport events are held were not taken into account;

- the Motorplex and residential populations have been considered mutually exclusive in the ERS analysis which is not the case; and
- industrial workers were not included as part of the affected population.

The peer review concludes that these factors would result in societal risk being significantly higher than that concluded in the proponent's societal risk report.

The peer review also concludes that:

- the Motorplex proposal would significantly hinder current operations, developments to existing facilities, development of unused land and future expansion of the KIA;
- the use of the buffer zone for activities which involve high populations is not consistent with best practice or the principle of "avoiding avoidable risks";
- the risk controls proposed in the proponent's societal risk report are very subjective and no analysis had been carried out to define their practicability; and
- the Motorplex would not probably satisfy the current KIA societal risk criteria (DNV 1990 and 1994) if a cumulative Quantitative Risk Assessment (QRA) was undertaken that would represent the current (1999) industry.

One of the key purposes of the proponent's societal risk report was to compare the estimated societal risk for the KIA with the Motorplex at the proposed site, with criteria adopted in other countries, and States of Australia. The report considered criteria for the Netherlands, Switzerland, Hong Kong and the UK.

The EPA notes that, even for the level of societal risk adopted in the proponent's report, which may be significantly underestimated, the Motorplex would not be consistent with criteria adopted for the Netherlands, Switzerland and Hong Kong. The proponent's societal risk report states that the societal risk for the KIA is not directly comparable with criteria adopted in these countries for a number reasons, but does not attempt to explain how a proposal such as the Motorplex would be considered in those countries. The EPA notes, in particular, that each of the three countries has adopted an "upper limit" on the maximum number of fatalities considered acceptable from a single industrial accident (1,000 people for Hong Kong and the Netherlands and 2,000 people for Switzerland), which is applied irrespective of the number of plants in the industrial complex. The Motorplex proposal would involve crowds in excess of these numbers on numerous occasions each year.

The proponent's societal risk report considered that the Motorplex would comply with the criteria proposed by the UK Health and Safety Commission Transport of Dangerous Substances Study (HSC, 1991). However, the upper F-N limit defined in the HSC criteria was developed for the Canvey Island port which is an extremely large complex and includes an extensive network for the transport of dangerous goods, much greater than Kwinana. The peer review also pointed out that the proposed site would not meet the Scaled Risk Integral which the HSC also applies when considering the acceptable level of societal risk for such developments.

The peer review states that, under the draft societal risk criteria widely used in Victoria over the past ten years, the proposal would not be approved.

The proponent's report on societal risk provided only a very brief discussion of the requirements of an emergency response plan (ERM, 1999b; section 6.6). The proponent has committed to develop an emergency response plan and states that "*it is unusual for such a plan to be developed prior to granting approval for a project*".

The proponent has subsequently further developed a conceptual emergency response plan which outlines some of the measures which would need to be taken:

- the more vulnerable population (ie. small children, elderly and disabled people) would be provided with shelter within the Motorplex complex while other patrons take shelter in their cars;

- increased presence of medical services on stand-by would go toward providing the necessary assistance to susceptible groups of people;
- the provision of simple emergency response procedures, for example evacuation instructions printed on entry tickets, would give patrons forewarning of what actions to take in case of an emergency;
- the presence of external emergency services at the complex is vital during major events.

In its submission to the EPA on the Public Environmental Review for the Motorplex, the Fire and Emergency Services Authority of Western Australia advised that it did not consider an effective emergency plan could be put in place and therefore could not support locating the Motorplex at this site. The key reasons for this position were:

- the short time available for notification, crowd control and evacuation;
- there is no practical protect-in-place evacuation alternatives;
- insufficient provision of evacuation routes out of the facility;
- risk of a dangerous goods transport incident immediately adjacent to the Motorplex.

The DNV peer review also concluded that it was unlikely that an effective emergency response system could be developed to provide safe evacuation or sheltering of spectators in the event of an accident.

### **3. Land Use**

The issue of the appropriateness of having the facility located in the Kwinana industry buffer zone was raised strongly in submissions from the Department of Resources Development, the Kwinana Industries Council and various industries in the Kwinana industrial area. In particular, they have advised that locating the facilities at the proposed site would be likely to hinder current operations, and constrain further development in the KIA.

The Kwinana buffer zone was originally delineated on the basis of air quality but has subsequently been recognised by planners, industry and local government as essential to separate high population areas from the normal hazards associated with a heavy industrial area. It has been generally recognised that, despite the introduction of international best practices into industry there is potential for occasional upset conditions which may result in off-site impacts from industrial processes. The buffer zone is designed to absorb the impact of such occurrences and to provide a measure of protection for the community against the unlikely but ever-present possibility of a severe accident.

The FRIARS report (WAPC, 1999) recognises that the buffer zone is appropriate for uses such as warehousing, light industry and some commercial activities. All these activities have the advantage that, in the event of an industrial incident, staff and customers have recourse to refuge within the buildings associated with premises – Motorplex patrons have no such recourse. The EPA notes that the preferred strategy set out in the FRIARS report emphasises the need for land uses to co-exist without having negative impacts on one-another and states that there is a need for new industries not to “create unacceptable noise impacts for the residents of Kwinana, Rockingham and Wattleup”.

### **4. Overall Summary**

The EPA makes the observation that there remains considerable uncertainty concerning the level of societal risk which would be imposed by locating a Motorplex facility at the proposed site. Added to this, there are no consistently adopted criteria against which to judge societal risk. However, in those circumstances where societal risk criteria have been applied, both

overseas and in Australia, it appears likely that a Motorplex facility located close to the Kwinana Industrial Area would not meet those criteria.

The EPA draws attention to its view on land use in relation to the appropriateness of locating such a facility within the industrial buffer zone, particularly, that the proposed facility would be likely to constrain further development in the Kwinana Industrial Area.

## 5. References

- AEA Technology (1995) *Kwinana Cumulative Risk Study*. Prepared for the department of resources Development.
- AEA Technology (1998) *Update of Kwinana Cumulative Risk Study*. Prepared for the Department of Resources Development.
- DNV Technica (1994) *Public Risk Criteria for the Kwinana Industrial Area*. Final report September 1990.
- DNV Technica (1994) *Societal Risk Study, Kwinana*. Final report April 1994.
- DPUD (1992) *North-West Corridor Structure Plan*. Department of Planning and Urban Development.
- EPA (1992) *Criteria for the Assessment of Risk from Industry*. EPA Guidelines; Bulletin 611.
- EPA (1998a) *Draft Guidance for the Assessment of Environmental Factors No. 8 - Environmental Noise*. Environmental Protection Authority, June, 1998.
- EPA (1998b) *Risk Assessment and Management: Offsite Individual Risk from Hazardous Industrial Plant*. Guidance for the Assessment of Environmental Factors, No. 2, Interim, July 1998.
- ERM (1999a) *Kwinana International Motorplex, Public Environmental Review*. Western Australian Sports Centre Trust; June 1999.
- ERM (1999b) *Kwinana International Motorplex, Societal Risk Report*. Western Australian Sports Centre Trust; July 1999.
- ERS (1999) *Kwinana Motor Sports Complex Societal Risk Sensitivity Analysis*. Environmental Risk Solutions, 1999
- Government of Western Australia (1997) *Environmental Protection (Noise) Regulations*. Department of Environmental Protection, Government of Western Australia, October, 1997.
- Government of Western Australia (1998) *Perth's Bushplan; "Keeping the Bush in the City"*. WAPC, November 1998.
- Health and Safety Commission, *Major hazard aspects of transport of dangerous substances, 1991, London*
- Miedema, Henk M E (1998) *Revised DNL-Annoyance Curves for transportation Noise*. Noise Effects '98, 7<sup>th</sup> International Congress on Noise as a Public Health Problem, Sydney; Vol 2.
- NSW EPA (1985) *Environmental Noise Control Manual*. Chapter 152, Noise Control Guideline, Motor Sport
- Western Australian Planning Commission (1999) *Fremantle-Rockingham Industrial Area Regional Strategy (FRIARS)*. WAPC, March 1999.