EDN FREQUENTLY ASKED QUESTIONS

Ethanedinitrile (EDN): An alternative to methyl bromide

Overview

This set of frequently asked questions (FAQs) has been prepared to answer your questions about EDN – a potential alternative phytosanitary fumigant to methyl bromide.

The Stakeholders in Methyl Bromide Reduction (STIMBR) has been seeking a suitable alternative for the fumigant methyl bromide which is currently used to treat about 22% of the logs exported from New Zealand. For the last four years STIMBR has been undertaking research to determine if ethanedinitrile (EDN) would be a suitable alternative. EDN is efficacious against forest insects, is cost effective, does not harm the atmosphere as methyl bromide does, it breaks down quickly, and does not accumulate in the environment. Hence STIMBR believes EDN is a sustainable treatment for logs and timber.

The EPA has publically notified that it has received an application from Draslovka, the manufacturer seeking an approval to import EDN for use on logs and timber in New Zealand. The EPA will accept submissions on the application until 12 April 2018.

Refer: https://www.epa.govt.nz/public-consultations/open-consultations/new-fumigant-for-logs-and-timber/

Since January 2011 STIMBR has led a research programme investing over $22 m seeking alternative phytosanitary treatments to methyl bromide, suitable physical treatments; and, tools and technologies to reduce methyl bromide emissions. When the EPA formulated the controls included in the 2010 Reassessment the expectation was that several alternative fumigants would be available by 2020. Only one has emerged – EDN.

Once EDN is approved by the EPA, the Ministry for Primary Industries will seek approval from our trading partners to allow the use of EDN as a phytosanitary treatment for forest products they import from New Zealand. STIMBR is providing robust scientific evidence to support market access negotiations for the use of EDN as a log fumigant.

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THE NEED FOR PHYTOSANITARY TREATMENTS

Q. Why are we using toxic fumigants in New Zealand?

A. New Zealand places requirements for certain treatments to be applied to produce and commodities imported into New Zealand to protect our environment. Similarly, other countries place requirements on goods that they import from New Zealand. Governments set and maintain phytosanitary standards that specify which products can be used to treat imported goods and commodities. Any changes to those standards require robust scientific evidence which must be accepted by the respective government agencies.

Q. What are the risks if we did not use fumigants as phytosanitary treatments?

A. Fumigants are important phytosanitary tools that enable us to sell our forest and plant products overseas.

Q. What would the effect be if fumigant use was banned in New Zealand?

A. If fumigants were banned from use we would not be able to sell approximately 70% of the logs we currently export. Markets to China and India would be closed resulting in a significant decline in New Zealand's export earnings. The total value of New Zealand's log trade in the year to June 2016 was about NZ$ 2.2 billion.

Q. Why are we not processing all of the logs we currently export in New Zealand?

A. New Zealand currently produces approximately 30 million cubic meters of logs annually of which just under 50% is consumed or processed in New Zealand. The balance is exported as logs. Saw milling is capital intensive. Prior to investing in saw milling operations, investors need to be assured that there is a market for their product. In a scenario where one new plant with the capability of processing 1 million cubic meters was built every two years, significant volumes of logs would still remain after nine additional mills of the same scale were constructed. One new mill recently closed after one year in operation underscoring the risk involved.

A NEW FUMIGANT

Q. Why is EDN being considered as alternative phytosanitary treatment to methyl bromide?

A. Methyl bromide is an ozone depleting gas. While it is recognised as a very effect fumigant international conventions require that it must be phased out and replaced with alternatives as they become available. In New Zealand methyl bromide use beyond October 2020 must include the use of recapture technologies.

An extensive review of scientific literature commissioned by STIMBR in 2014 found only one promising alternative to methyl bromide as a phytosanitary control measure. The review identified EDN as the most promising option available. Research to determine the efficacy of EDN confirms that it may be an effective phytosanitary treatment for insects associated with New Zealand forest products.

Q. Is EDN ozone depleting or a greenhouse gas?

Unlike methyl bromide, EDN is not an ozone-depleting gas (nor is it a greenhouse gas). Moreover, EDN dilutes more quickly and easily in the environment degrading to form ammonia and carbon dioxide. EDN does not remain as a residue in the environment nor does it accumulate in either the soil, or in plants or animals.

Q. Where else is EDN registered for the treatment of forest products?

A. EDN is registered in Australia for interstate biosecurity treatments of logs. Registration for use as a soil fumigant and other uses are in the pipeline.

EPA – REGISTRATION PROCESS

Q. What role does the New Zealand Environmental Protection Authority play?

A. The New Zealand Environmental Protection Authority (EPA) protects people and the environment by delivering robust, objective decisions on environmental matters. It is also responsible for ensuring compliance with rules it determines. The EPA is informed by robust analysis of applications to register hazardous substances for use in New Zealand. The Authority also regularly reassesses hazardous substances that are registered for use in New Zealand. An open and transparent submission process provides opportunity for anyone who wishes to be heard by the Authority prior to making a decision.

Q. What is required to inform the EPA decision of EDN registration?

A. Before it can be used commercially, EDN must be approved by the EPA. A rigorous process is undertaken to identify risks associated with the substance and measures to manage any risk are determined. The evaluation of scientific data by specialists to determine impacts on the environment, economic costs, benefits and sustainability of the use of EDN is central to this process.

Q. Am I able to make submissions on the application for registration of EDN?

A. Yes. Any New Zealander is able to make a submission on the application to register EDN in New Zealand. Given the significance of EDN as being the only identified likely alternative fumigant to methyl bromide which meets the efficacy requirements for phytosanitary use, submissions supporting the use of EDN are expected.

Q. What level of detail must be included in the application for registration?

A. Draslovka (the manufacturer and applicant for the registration of EDN) has commissioned independent OECD[1] compliant trial data to define EDN's environmental and toxicological parameters. Detailed dossiers have been prepared to support registration. The dossiers describe the physical and chemical properties of EDN; toxicological and metabolism studies; fate and behaviour in the environment; eco-toxicological studies; the identification, assessment and evaluation of risks; and, the costs and benefits. The dossiers have also been prepared by Draslovka to inform applications for the registration of EDN in other countries including the EU and the USA.

Q. Has an application to register EDN been made previously in New Zealand?

A. A previous application to register EDN was made to the EPA in November 2011 by BOC, Australia. The application was incomplete and consequently was withdrawn by BOC.

[1] The Organisation for Economic Co-operation and Development (OECD) promotes policies that will improve the economic and social well-being of people around the world. The OECD Principles of Good Laboratory Practice (GLP) ensure the generation of high quality and reliable test data related to the safety of industrial chemical substances and preparations. The principles have been created in the context of harmonising testing procedures for the mutual acceptance of data by OECD member states.

METHYL BROMIDE

Q. What is methyl bromide?

A: Methyl bromide (CH_3Br) is a colourless, odourless, non-flammable gas that is produced both, industrially and by natural biological processes including the ocean, some plants, fungi and soil. Automobile emissions, burning of biomass and biofuel production also produce methyl bromide. Methyl bromide is manufactured for use at higher than the naturally occurring concentrations to kill unwanted pests associated with the movement of goods internationally. It is also an important input into a number of different industrial chemical processes.

Q. What international treaties and law govern the use of methyl bromide?

A. The use of methyl bromide is regulated by the United Nations Vienna Convention for the Protection of the Ozone Layer 1985 (ratified by New Zealand 2 June 1987), and the Montreal Protocol on Substances that Deplete the Ozone Layer 1987 (ratified by New Zealand 21 July 1988). New Zealand's obligations under the Montreal Protocol are implemented through the Ozone Layer Protection Act 1996 and the Ozone Layer Protection Regulations 1996. The use of methyl bromide in New Zealand is managed under the Hazardous Substances and New Organisms Act 1996 and the Resource Management Act 1991. Quarantine and pre-shipment use is allowed under both international and local laws for official treatments.

The EPA reassessed methyl bromide use in New Zealand in 2010 determining that from October 2020 on ward all methyl bromide fumigations would require the use of recapture technology.

Q. What effort has been made to identify sustainable alternatives to methyl bromide?

A. A number of alternative substances have been assessed as a possible replacement for methyl bromide. The Stakeholders in Methyl Bromide Reduction (STIMBR) invests in research seeking alternatives to methyl bromide, reduction in rates used, and technologies and tools to manage methyl bromide emissions.

Q. How is STIMBR funded

STIMBR raises its funds through a voluntary levy on the use of the fumigants methyl bromide and phosphine. These funds are supplemented with co-funding from government, industry and trust funds where possible. Over the last seven years over $22 million has been invested in research.

More detail about Stakeholders in Methyl Bromide Reduction Inc. (STIMBR) and its activities can be found here: http://www.stimbr.org.nz/

Q. Why is methyl bromide used in New Zealand?

A. The use of methyl bromide for biosecurity and phytosanitary treatments is permitted by international agreements. These agreements however require countries to seek and use alternatives where possible and as they become available.

Our trading partners determine what treatments are required for logs exported from New Zealand. Some partners, India for example does not accept any other treatment. On the other hand China permits the use of phosphine, which is cost effective, and debarking as a risk reduction measure. Debarking is more expensive than the use of phosphine or methyl bromide. New Zealand needs to continue to use methyl bromide until suitable alternative phytosanitary treatments for our logs are found that are technically and economically feasible. That quest has proven to be very challenging.

Q. Why are alternatives to methyl bromide being sought?

A. In 2010 the New Zealand Environmental Protection Authority (EPA) reassessed the use of Methyl bromide as a phytosanitary[2] treatment, and imposed greater controls on its use to improve environmental and health protections. A major consideration and area of concern during that reassessment was that methyl bromide is an ozone depleting gas. For that reason the EPA required that all methyl bromide fumigations require recaptured technologies from October 2020 onwards.

Further questions regarding methyl bromide are available by clicking on this link

[2] Treatment to remove pests and diseases

EDN – BACKGROUND

Q. What is EDN?

A. Ethanedinitrile (EDN) is a fumigant (gas) which is suitable as a biosecurity and phytosanitary treatment. EDN is a gaseous substance (boiling point -21°C). It is produced naturally (approximately 15,000 tons per year) when organic matter is burnt, smoked or decomposes. It is a colourless, flammable, toxic gas at room temperature and atmospheric pressure. It has no ozone depleting properties and no known global warming potential.

EDN is a fumigant that shows potential as a possible replacement for methyl bromide.

Q. How long has EDN been known to science?

A. EDN is not new. It was discovered in 1815 but was not manufactured on a large scale until the late nineteenth century. EDN was patented in 1960 for use in the nitrate fertiliser industry. It was patented as a fumigant in 1996 by CSIRO, an Australian government research organisation.

Q. What other uses are there for EDN?

A. EDN is a promising soil fumigant. Research and field trials have shown that it can be used as a soil fumigant to kill soil borne pathogens, nematodes and weed seeds prior to planting crops. EDN is also used in the production of nitrocellulose, a material with a wide range of applications including but not limited to: medicine as an active ingredient in wart remover, molecular biology to help detect gene sequences, cosmetics in nail polish, theatre in magician's flash paper, as an ingredient in explosives and for holding office staples together prior to their use.

Q. When was EDN identified as a possible fumigant?

A. In 1996, Australia's CSIRO patented EDN internationally as; "*a fumigant*… [that] *provides a viable alternative to conventional fumigants, such as methyl bromide, phosphine, and carbonyl sulphide*." Although there were a number of preceding patents on EDN uses and production, the CSIRO et al. (1996) patent was the first to identify EDN specifically as a fumigant.

Q. How was EDN identified in New Zealand as a possible alternative to methyl bromide?

A. An extensive review of scientific literature commissioned by STIMBR in 2014 identified EDN as the most promising alternative fumigant to methyl bromide as a phytosanitary control measure. Efficacy test results to date suggest it is an effective phytosanitary treatment for insects associated with New Zealand forest products.

EDN – MANUFACTURE

Q. Who manufactures EDN?

A. EDN[3] is currently manufactured exclusively by Draslovka, a family-owned company based in the Czech Republic. Draslovka purchased the sole rights to EDN from Linde AG at the end of 2014, followed by a significant investment to develop EDN into a commercially and environmentally-accepted broad spectrum fumigant.

Q. How is EDN manufactured?

A. Draslovka use a process refined by chemists working in their Kolin, Czech Republic manufacturing facility which specialises in cyanide chemistry. Natural gas is used to form ammonia which is transformed in a chemical process to hydrogen cyanide which acts as the building block for EDN and a range of other products, from rubber plasticisers, plant growth substances, animal feed additives and high quality perfume essences.

[3] Active ingredient Ethanedintirile (EDN)

Q. Why is cyanide relevant?

A. EDN breaks down within the target pest to form the cyanide ion and cyanic acid. The mode of action of EDN within the target organism is consequently the same as that of hydrogen cyanide. As the pathways of EDN and cyanide poisoning are the same, the toxicological data of chemicals within this group can be applied to both chemicals in what toxicologists refer to as a 'read across approach'.

The following information about cyanide is provided as cyanide is a well-known and widely used compound closely related to EDN. Hydrogen Cyanide manufactured by Draslovka is already currently registered in New Zealand as a fumigant, and is also available in New Zealand as a pellet or paste for pest control. EDN is only available in the gaseous form.

Q. Tell me more about naturally occurring cyanide?

A. Hydrogen cyanide and related substances are naturally present in a wide range of foods[4]. Cyanide is also released during the burning of organic matter and plastics in fires and incinerators; and when smoking. People who smoke, place themselves at risk of cyanide exposure. Animals have evolved chemical processes that convert cyanide and related compounds to less toxic materials in the liver which are then secreted from the body via the kidneys.

Q. What foods contain cyanide?

A. Low levels of cyanide are found in almonds (both sweet and bitter), apple pips, spinach, lima beans, soy, millet sprouts, cassava (including tapioca) and bamboo shoots. The seeds of peach, apricot, plum and cherry all contain substantial amounts of chemicals that metabolise to cyanide. It is well known that eating a few kernels (seeds) of these fruits is OK eating too many should be avoided.

Q. Won't cyanide remain in food stuffs and cause issues for consumers?

A. Hydrogen cyanide breaks down very quickly to non-toxic products. The Food and Agriculture Organisation of the United Nations considers that following fumigation any residual cyanide in fumigated food stuffs would be at very low levels and will present no hazard to human consumers. Human beings and animals have evolved with low levels of hydrogen cyanide and related substances being present in the environment and plants. Consequently our bodies (and those of other animals) have evolved natural processes that quickly and effectively break down these chemicals. Following the ingestion of low levels of cyanide and related compounds they are rapidly converted in the liver to thiocyanate and excreted from the body.

For example there is enough cyanide in three apricot or bitter almond kernels to harm the average adult. On the other hand 2,100 sweet almond kernels would need to be eaten at once to harm an average adult. Cassava (also called manioc or tapioca) is a staple food for many people in Africa. Some people living on a subsistence diet in remote parts of the African continent have no choice but to rely on cassava as a major source of carbohydrate as it is easily grown and relatively cheap. Where cassava forms a major part of the diet of low income people they can suffer from a form of cyanide poisoning known as konzo. A simple method of treating the cassava flour prior to cooking significantly reduces the amounts of residual cyanide compounds found in cassava flour.

[4] According to the U.S. Agency for Toxic Substances and Disease Registry the following foods naturally contain cyanide: almonds, millet sprouts, lima beans, soy, spinach, bamboo shoots, and cassava. Additionally cyanide is found in most any fruits that have a pit, or core, like cherries, apricots, and apples. The site reports that no foods are consumed in large enough quantities to be toxic. Cyanide can also be produced by certain bacteria, fungi, algae, and as a by-product of industrial manufacturing and waste.

Q. Hasn't cyanide been used to kill people?
A. Yes, sadly cyanide has been used as a genocidal agent. Hydrogen cyanide is used in some states of the United States of America and elsewhere to execute condemned prisoners. However, like any toxic substance, safety and care is of the utmost importance.

Q. Is cyanide used for any other purposes?
A. Cyanide is a chemical with a wide range of uses in many industries. For example it can be used in electroplating processes, jewellery making, photography processes and significantly for the recovery of gold in mining operations. It is also used in chemical manufacturing processes to form related compounds that are used in medicine, as plasticisers for rubber, plant growth substances, animal feed additives, food stabilisers – in table salt for instance - as an anticaking agent, and fragrances.

Q. Is cyanide used as a fumigant?
A. Hydrogen cyanide was one of the first fumigants to be widely used and is now used in some countries for fumigation including some horticulture produce, ships, aeroplanes and structures to kill pest species. As other fumigants which were easier to apply became available, hydrogen cyanide lost its place. However, since methyl bromide has been phased out as a soil fumigant and suitable alternatives are being sought for methyl bromide use as phytosanitary treatments, EDN has emerged as a strong contender as a possible replacement for soil, biosecurity and phytosanitary uses.

Q. What products are treated with hydrogen cyanide in New Zealand?
A. Hydrogen cyanide use in New Zealand as a fumigant for pests on bananas, pineapples and other products imported into New Zealand to eliminate pest species that we do not want in New Zealand.

Q. What other uses are there for hydrogen cyanide?
A. Internationally hydrogen cyanide is used in the aviation and shipping industries to fumigate aircraft and vessels because it kills vermin and then dissipates and breaks down quickly leaving no residues.

Q. Isn't cyanide also used to kill possums and wallabies in New Zealand?
A. Cyanide is registered in New Zealand for the control of introduced possum and wallaby. Both species are a threat to conservation efforts. The possum also spread tuberculosis. It is used in conjunction with baits that are applied from the ground. Cyanide is relatively cheap and is used as a paste or pellet. It has low environmental persistence and the risk of secondary poisoning is low. Those wishing to use cyanide must be permitted by the Department of Conservation and are required to undergo training to ensure that it is used safely.

Q. Is EDN safe?

A. All fumigants are toxic gases. They are successful fumigants because they kill target pests that may reduce crop yields, damage and consume stored products, or damage wooden structures. EDN is toxic when target pests are treated with the fumigant in a confined space. The EPA approves the use of hazardous substances such as EDN setting controls that manage and reduce the risks to users and the environment.

Q. Where has EDN been registered for use?

A. EDN is registered for use in Australia as an interstate biosecurity measure for use on logs and sawn timber. Application has been made for permission to use EDN for soil use. Approval to do so is expected in 2018.

Q. Will EDN be freely available for use in New Zealand?

A. No. EDN will not be freely available for use. As a hazardous substance, it is expected that the EPA will require that EDN will only be sold to and used by approved licensed applicators. The supplier will be required to provide training to the users for the safe use of this fumigant.

Q. Will EDN use put humans at risk?

A. When EDN is registered EPA will require that the controls to manage and reduce risk are complied with. Bystanders will not be put at risk. EDN is not significantly more toxic to humans than methyl bromide and exposure to it is not cumulative meaning that when someone uses EDN repeatedly they are not at risk of it building up in the body.

Q. How will EDN be applied?

A. EDN is a 'drop in' replacement for methyl bromide. The same equipment that is used to apply methyl bromide will be used. Logs will be covered with a tarpaulin that is secured with water snakes around the base of the log stack. The EDN is then delivered into the stack through a series of delivery tubes that are placed in the stack prior to it being covered. When the fumigation is finished the covers are removed allowing venting. The vented EDN dissipates quickly in the atmosphere.

Q. Is resource consent required to use EDN?

A. All fumigation service providers must apply for resource consent for their activities. Resource consents are granted by regional and unitary councils.

Q. Where will EDN be used to treat export logs?

A. Logs are fumigated at the ports where they are to be loaded onto ships. Ports where methyl bromide is currently used i.e. North Port, Tauranga and Napier are likely to be the first to use EDN once it is approved as a phytosanitary treatment.

Q. What personal protection devices will be available to those working with EDN?

A. Draslovka, in conjunction with a number of manufacturers, has worked on the development of hand held monitors that will be available for use by those applying EDN.

Q. Will EDN move through the tarpaulins used to cover log stacks?

A. Tests undertaken by Dr Husein A. Ajwa, University of California, Davis, Salinas, found that the tarpaulins used in New Zealand do not allow EDN to move easily through the fabric. The same tests confirmed that EDN is the least likely fumigant to move through the fabric used to cover log stacks in New Zealand.

Q. What levels of EDN are present during the fumigation of commercial log stacks?

A. Sullivan Environmental service a respected consultancy has modelled the atmospheric concentrations of EDN that are likely to occur at the Port of Tauranga during fumigation and venting. Emissions during fumigation and on venting have been found to be low. Detail is available on in the application. Refer also next section: Q. *How does EDN act as a log fumigant*?

EDN – MODE OF ACTION AND TOXICITY

Q. How does EDN act as a log fumigant?

A. When released into the fumigation space EDN is rapidly absorbed by the logs. Trials have shown that only 1% of the applied EDN remains in the fumigation atmosphere after 24 hours. When EDN is absorbed by the logs it breaks down quickly forming cyanide and from there cyanide ions which act on the target organism's metabolic processes killing the pest species present. Trials have shown that very little EDN is released from the logs on venting.

Q. What happens to EDN in the human body?

A. In the body EDN dissolves in the aqueous solutions in the lungs. The rate of hydrolysis of EDN is very fast once in the lungs where it breaks down to form hydrogen cyanide and from there hydrogen, cyanide and cyanic acid (HOCN). Cyanide and cyanic acid prevent the absorption of oxygen from the blood in the normal manner. If the process continues the cells die. The process is reversible. If poisoning does occur a person who has lost consciousness as a result of cyanide poisoning, but whose heart is still beating, may recover if the appropriate antidotes and management practices are applied in time.

Q. What is the break down pathway for EDN?

A. EDN has the same mode of action as other compounds with cyanide like toxicity such as hydrogen cyanide or acetonitrile (a solvent used amongst other things for removing artificial finger nails). As the pathways of EDN and cyanide poisoning are the same the toxicological data of chemicals within this group can be applied to both chemicals in what toxicologists refer to as a read across approach.

Q. Are antidotes available for use if EDN poisoning occurs?

A. Yes antidotes are available for use if needed. Antidote chemistry, administration and patient management are well documented and known. However, an antidote is really the last resort and is applied only in the case of acute exposure to high concentrations. In most circumstances exposure to EDN can be mitigated by moving the effected person to fresh air and allowing them to rest.

EDN – TOXICOLOGY

Q. Is EDN harmful to humans?

A. Yes. However, EDN is not significantly more toxic to humans than methyl bromide and exposure to it is not cumulative meaning that when someone is exposed to EDN repeatedly they are not at risk of it building up in the body.

Q. Is EDN harmful to other life forms?

A. EDN is harmful to living organisms if they are exposed to lethal concentrations for sustained periods. However, EDN does not remain as a residue in the environment or accumulate in; either the soil, plants or animals. EDN or its breakdown products do not disrupt the endocrine system of animals including humans nor does it have reproductive effects on microbial, vertebrate or invertebrate organisms.

Q. How can I know that EDN will not harm my family and the environment?

A. Certified European and North American laboratories have been contracted by Draslovka to independently carry out soil, water and atmospheric studies; terrestrial and aquatic animal toxicity tests; and Ames tests. The EPA experts will consider the data and provide advice to the EPA Decision Making Committee (the Authority) during the decision making process.

Q. What is the Ames test?

A. The Ames test is a widely employed method that uses cell cultures to test whether a given chemical can cause mutations in the DNA of the test organism. More formally, it is a biological assay to assess the mutagenic potential of chemical compounds.

Q. How does the toxicity of EDN compare with methyl bromide and phosphine?

A. A table comparing the toxicological data for EDN with the two fumigants (methyl bromide and phosphine) currently in use in New Zealand can be found in the Application (refer Appendix p212-216) posted on the EPA web site.

EDN – ENVIRONMENTAL EFFECTS

Q. Will EDN persist in the environment?

A. Unlike many chemicals used in a wide range of applications EDN does not persist in the environment.

Q. What do we know about the impact of EDN?

A. We know the following about EDN:

1. EDN is not an ozone-depleting gas nor is it a greenhouse gas.
2. EDN is not significantly more toxic to humans than methyl bromide.
3. Exposure to EDN is not cumulative.
4. EDN is more volatile than methyl bromide; and,
5. Decomposes more readily in the environment.
6. EDN degrades to form ammonia and carbon dioxide.

Q. Have the environmental effects of EDN been assessed?

A. Yes.

Q. Does EDN damage the environment?

A. Unlike methyl bromide, EDN is not an ozone-depleting gas (nor is it a greenhouse gas) and it is more volatile so decomposes more quickly and easily in the environment. EDN degrades in water, sediment and soils to form ammonia and carbon dioxide.

Q. Will EDN move into water during or following fumigation?

A. Modelling has shown a negligible amount of EDN (0.000125%) is transported to water from air and from there into the sediments (0.0000002%). Given the low measured levels of free EDN expected at a fumigation site any effect on an aquatic environment at greater than 1 metre from the log stack is regarded as highly unlikely.

Q. Will EDN move from the air into soils following fumigation?

A. Modelling has shown negligible amount of EDN (0.005%) is transported to soil from air. Given the low measured levels of free EDN expected at a fumigation site and the industrial nature of the sites any effect on soil organisms are regarded as almost impossible.

Q. Will EDN use result in the immediate death or adverse effects to animals?

A. No. If the EDN is used in accordance with the manufacturer's directions and the controls determined by the EPA birds and other terrestrial vertebrates close to the stack being fumigated are unlikely to be affected by the substance unless they are under the tarpaulin. Only a small fraction of the fumigant passes through the tarpaulin and what does dissipates quickly. Furthermore animals have the ability to break down the cyanide molecule in the body. Moreover; given the industrial nature of the site – few birds and other terrestrial vertebrates are present – it is unlikely they will be affected.

Q. Will EDN use result in the immediate death or adverse effects to beneficial insects?

No. Due to the industrial nature of the fumigation site and lack of growing plants the number of beneficial insects (e.g. bees) present will be very low limiting any effect to a small number of individuals if any.

EDN – MĀORI VALUES

Please explain how EDN sits with each of the following four Māori values?

Taha Ohanga
Tangata whenua have a large ownership interest in forestry land and are also a significant proportion of the forest industry workforce. During the reassessment of methyl bromide, tangata whenua land and forest owners noted the importance of fumigation to their ability to continue to capitalise on the return of these assets both in terms of employment and timber exports. Given methyl bromide is subject to the Montreal Protocol relating to ozone-depleting substances, EDN provides an alternative that we believe is equally effective, but safer on the environment.

Taha Hauora
EDN is not significantly more toxic to humans than methyl bromide and has no cumulative effects. Draslovka places a high priority on the safe production and use of EDN. Draslovka is not only studying the effects of EDN but is also developing a range of equipment and monitors so that it can be safely used anywhere.

Kaitiakitanga
There may be some concern that the use of EDN could lead to the deterioration of the mauri of taonga flora and fauna species, and that its use could impact negatively in relation to the kaitiakitanga role of tangata whenua over waterways. EDN is specifically designed to control agricultural pests and the use of fumigants such as EDN on logs and timber destined for export overseas is important to ensure the biodiversity of importing nations is protected. This means that for the insect species present on the timber at the time of fumigation, EDN is toxic enabling their removal. However, given the strict rules that apply to the fumigation process, and what we know already about EDN including that it degrades rapidly in the environment, significant impacts to flora and fauna near the site of fumigation are not anticipated.

Manaakitanga
Given that a substantial level of fumigation occurs at ports, there may be concern that any negative impact from the use of EDN might pose a risk to kaimoana species important to the ability of tangata whenua to harvest for them-selves or to host their manuhiri appropriately and safely. EDN is more volatile than methyl bromide and does not easily enter water and degrades quickly so we do not anticipate any significant impact.