To the Environment Protection and Heritage Council

Dear Sir/Madam

I work on the issue of  plastic waste and have come across a common problem, that needs attention and might fall under EPHC jurisdiction.

It concerns the raw plastic resin pellets that manufacturers buy to make their plastic products from.    These are often bags of 25 kg plastic bags of loose pellets or larger containers.   The pellets vary in size from a few mm to 10 mm or so in diameter.  The 25 kg bags are insufficient packaging to handle transport mishaps and on site handling mishaps.

What is happening is these pellets are being released into the environment by either transport mishaps, careless handling by users or dumping.  The result is these pellets are showing up in many waterways and along beaches where they get mixed in with the sand.  The pellets are so prevalent along many beaches around big cities in Australia that there must be a considerable amount of pellets being released.  It is a majour problem overseas in other countries as well.

Plastic as you know takes 100’s of years to break down and hence these pellets are going to be a pollution problem on these beaches and in our oceans for a long long time.   The pellets float on water and will flow along with any moving water.   Wildlife can see them as food and eat them.  Some fish have been caught with over 80 pieces inside of them.  The pellets do not get digested and can affect the buoyancy of the fish causing them to die.   The pellets have a large relative surface area and can absorb contaminants in the water.  Then when eaten by fish these contaminants can become absorbed into the fish.   For humans the sight of these pellets on beaches is unpleasant to say the least.

There are no regulations governing the use of the pallets.  Anyone can buy them and use them how they wish.  Hence it is not possible to determine who are the careless users of these pellets and put a stop to their release into the environment.

Given the problem these pellets can cause, I would suggest these pellets be regulated as a hazardous good where by users have to be registered to import/sell and use these pellets.   Stronger packaging of the pellets should be considered.  Each type of pellet has its own characteristics and with the type of pellets registered, then when loose pellets are found in the environment, it would be possible to track down the importer and then the end user of them.    For users who use them in a responsible way this would only be a minor inconvenience for them with filling out some extra paperwork.  But for reckless users, then fines could be imposed for the damage to the environment they are causing.

Attached is an article in support of this from an organisation in Queensland.   You can see there are international agencies in other countries trying to address the problem in their counties as well.   Tangaroa Blue have spent quite a bit of time on this issue in QLD and WA, on trying to stop these pellets from being released into the environment.  But given the national spread of this problem, a national solution is needed.  I have covered this issue on my company website

[www.plasticwastesolutions.com](http://www.plasticwastesolutions.com)   as well

I hope this is an issue NICNAS and the Vic government can take on.  My research shows there are only about a dozen bulk importers of these pellets, plus a few local pellet manufacturers and then maybe 100-200 plastic manufacturers in Australia.  Hence it would not be a big cost to put this registration in place and stop a large environmental problem.

Should you have any questions please let me know.

Regards

Ross Headifen Ph.D

MARINE MICRO PLASTIC POLLUTION NEWSLETTER

INTRODUCTION

Welcome to the first issue of the Marine Micro Plastic Pollution Newsletter. This first issue is somewhat introductory in nature so first a few words about its purpose are in order.

There is a growing recognition in the public sphere about the escalating amounts of marine debris in the world's oceans and some awareness of its harmful and lethal impacts. There is much less awareness, however, about the global distribution of micro plastic particles in all their forms and varieties. At least in part public perception is compromised by the fact that micro plastics are not easily observed.

The study of micro plastics in the marine environment and their consequent impacts on life also holds its challenges but in the last decade or so important findings have been made. Researchers have shown that micro plastic particles pollute every ocean and all parts of the water column and are taken into the food web at many - perhaps all trophic levels. When researchers in Japan showed that persistent organic pollutants such as DDT and its breakdown products were being absorbed onto the surface of plastic resin pellets they quickly recognized that these pellets and micro plastics in general had the potential to transport high concentrations of these toxins around the oceans and into the food web.

Public, governmental and institutional awareness of the marine micro plastic problem is limited. This means industrial and commercial practices and processes which generate pre production micro plastic pollutants are largely unregulated. There is also a very limited awareness that post consumer plastic items and packaging once in the environment begin fragmenting into ever smaller pieces generating huge numbers of micro plastic particles over time.

What we hope to achieve with this newsletter is to provide a focus for these issues with articles and reviews covering research and governance developments as well as industry and community perceptions and activities around the micro plastics issue. There will be an emphasis at least initially on plastic resin pellets as these can be seen with the naked eye and a fair amount of research has been carried out on them but we stress that in the microcosm stretching downwards from 5mm there is a problem of vast dimensions involving micro plastic pollutants and manmade toxic substances.

A BRIEF DESCRIPTION OF MARINE MICRO PLASTIC POLLUTANTS

Marine debris is generally divided into two fractions - the macro marine debris fraction and the micro marine debris fraction. Plastic in the sense of plastic material made from petroleum based products is the most prevalent material in both fractions and the convention has evolved whereby micro plastic marine debris or the abbreviated micro plastics refers to any plastic item 5mm or less in size.

Micro plastic pollutants take many forms. Pre production plastic resins come in pellet and powder form ranging from 5mm to a few hundred micro meters. Plastic scrubbers are usually ground or shredded pieces of plastic measured in microns. Plastic films breakdown into micron sized shredded pieces while the abrasion on synthetic rope produces micron sized filaments. Synthetic filters in cigarette butts Tangaroa Blue Ocean Care Society Marine Micro Plastic Newsletter No 1 February 2011 Page 2

produce nicotine saturated fine hair like fibres in their billions. And then there are nano-polymers about which very little is known as to their environmental behaviour and impact. All plastics if remaining in the marine environment long enough will fragment down toward their individual molecular parts - their individual monomers.

PLASTIC RESIN PELLETS - HOW BIG IS THE PROBLEM?

People are largely unaware of plastic resin pellets both regarding what they are and what they are used for and also the fact that there are vast numbers of them circulating in the world’s coastal and ocean systems and inside the food webs in those environments. A brief excursion into some of the developments in the plastics industry can offer some insight into why there are so many.

The first fact to consider is that total world plastic production in the first decade of this century has roughly equalled the total plastic production of the entire 20th century. In the decades following World War 2 there was a growing explosion of plastic consumer and other products in forms as varied as kitchenware, motor vehicle parts, baby products and medical items, and alongside them all a large and growing array of plastic packaging.

Following just one type of packaging item gives a glimmer of the explosive growth. In 1977 in the United States production of plastic drink bottles for soft drinks stood at zero. By 1999 10 billion plastic soft drink bottles were being produced annually. Another plastic drink bottle statistic shows current annual global consumption of plastic water bottles at 200 billion.

A natural parallel development to this kind of explosive growth was the growth in and technologic development of the plastic resin manufacturing and processing industry. Imagine the transport space required to ship 200 billion plastic drink bottles. This kind of logistic spurred the development of cheaper easily transported and installed blow mould and other plastic fabricating machinery. To feed these machines plastic resins are produced and transported in powder and pellet forms. The plastics industry had decentralised the production of plastic consumer and packaging goods and at the same time created a transport network of plastic resin powders and pellets to most major population centres throughout the world.

Because of their small spherical and lightweight nature plastic powders and resin pellets have been spilling into or deliberately dumped into the environment at rates corresponding to the growth of the industry. A little over half of plastic resins are negatively buoyant - there is not much information on where this fraction ends up in the environment. The remaining buoyant fraction pollutes drains, rivers, estuaries, coasts and the open ocean globally.

The first decade of this century has been characterised in economic terms by the shift of industrial activity - especially labour intensive and polluting industries from western economies to China, India and other developing economies. Coupled with the rapid growth of western style consumerism in these countries the demand for plastic products components and packaging has skyrocketed. The market for plastic resins in these countries is huge.

Picture each continent and all the major towns and cities on their coasts, now picture a constant stream of tiny plastic pellets varying in quantity but coming from each of them day and night in some cases and more episodically in others. This constant leakage of pellets globally has been gathering strength and scope ever since World War 2. There are a lot of plastic resin pellets out there and they are capable of doing a lot of harm. Tangaroa Blue Ocean Care Society Marine Micro Plastic Newsletter No 1 February 2011 Page 3

GOVERNANCE

SWAN RIVER MEETING

In a meeting that may be a first in Australia the issue of tackling the loss of plastic resin pellets into the environment was tackled by representatives from the Swan River Management Trust, Department of Environment and Conservation, Perth Natural Resource Management (NRM), the cities of Belmont and Bayswater and Tangaroa Blue Ocean Care Society (TBOCS).

The meeting listened to a presentation covering the issue and a report on the occurrence and distribution of pellets in the Swan River system between the Port of Fremantle and Belmont.

Several practical actions were discussed. The first issue was as to whether existing regulations and acts were suitable for managing compliance regarding pellet discharge into the environment. Second was an existing programme - the Light Industry audit programme run by Perth NRM - which had the capability to record the presence of pellets for use in small to medium enterprise premises. Monitoring for the presence or absence of pellets in the river and drainage system could be included in the water monitoring processes as the third action. These are preliminary measures to assess the scale of the problem and to gather baseline data.

Photo Courtesy Rebecca Gunner

Blue plastic scrap intermixed with plastic resin pellets found in a drain at Bayswater W.A.

These wine coloured pellets were amongst the blue plastic scrap and clear plastic resin pellets from Bayswater pictured below.

**We would very much like to hear from any catchment or management bodies around the country about existing programmes they have regarding the loss of plastic resin products and other micro plastics into the wetland, river and marine environments.**

MONITORING ACTIVITIES

The following summary provides an overview of Plastic Resin Pellet (PRP) presence in parts of Australia and New Zealand.

TBOCS has been actively monitoring PRPs on the south west coast of Western Australia since 2006. In that time we have found pellets on almost every beach surveyed covering approximately 1000 km of coastline. Three remote sites suited to trapping and accumulating pellets have been estimated to hold close to, or in excess of 1 million pellets in certain seasonal conditions

Recently a Victorian catchment Management Authority co-ordinator related the collection of 500 PRPS to be sent to International Pellet Watch.

At the end of 2010 TBOCS had an opportunity to present a display at each of musician Jack Johnson’s Australia and New Zealand concerts. When the opportunity arose Heidi Taylor TBOCS co founder looked for pellets in the cities visited, finding pellets on Cottesloe Beach WA, abundant pellets in Melbourne Victoria both in the Yarra River and on the city Tangaroa Blue Ocean Care Society Marine Micro Plastic Newsletter No 1 February 2011 Page 4

waterfront of Port Phillip Bay and in the Brisbane River, Brisbane Queensland (subject to devastating floods weeks after the tour). Pellets have also turned up in low numbers at Port Douglas on Queensland's far north coast.

These pellets were collected near Kerferd Pier in Melbourne. They show a wide range of colours with uncoloured pellets showing low, medium and high degrees of staining.

On the New Zealand leg of the tour pellets were found in Auckland Harbour where a few weeks later a skipper working for the Waitemata Harbour Cleanup Trust told of heavy concentrations on Takapuna Beach just north of the entrance to Auckland Harbour. He related how concentrations of many thousands of pellets per square foot were being found as far back as 1972.

**If you find pellets on your local beach or in rivers or drains please let us know. By mapping pellet occurrence and estimating concentrations we will be able to begin identifying their sources and informing local management organisations.**

INTERNATIONAL

INTERNATIONAL PELLET WATCH

Japan based International Pellet Watch aims to collect plastic resin pellet samples from throughout the world. The purpose is to test for different organic pollutants absorbed on the surface of pellets and by mapping the results, show the global distribution of these pollutants. The international pellet watch website is www.pelletwatch.org

**For guidelines on collecting samples to send to Japan, please refer to the website or contact TBOCS for further information.**

5TH INTERNATIONAL MARINE DEBRIS CONFERENCE

This conference will be held in Honolulu, Hawaii in March 2011. Scientists, researchers and representatives from an array of organisations involved in the marine debris issue will discuss every aspect of the marine debris problem with a focus on solutions.

We will bring you news and developments on the micro plastics issue straight from the conference.

EDITORIAL TEAM

**Your input in the way of articles, photos or comments are very welcome.**

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*When submitting articles please make them relatively brief. We are especially looking for practical information that can be shared or helps broaden knowledge about research, governance and other practical matters related to marine micro plastic pollution.*