

SPREP

South Pacific Regional
Environment Programme



PROE

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Kiribati POPs Project Country Plan **(Prepared by SPREP, January 2003)**

1. Introduction

The Australian Agency for International Development (AusAID) several years ago identified the mismanagement of hazardous chemicals in the Pacific Island Countries as a serious environmental concern, and hence the Persistent Organic Pollutants in Pacific Island Countries (POPs in PICs) project was developed as an AusAID funded initiative, to be carried out by SPREP. POPs are a group of twelve particularly hazardous chemicals that have been singled out by the recent Stockholm Convention for urgent action to eliminate them from the world. They include polychlorinated biphenyls (PCBs), which are mainly found in transformers, and several pesticides that are very persistent and toxic to the environment.

Phase I of the project involved predominantly an assessment of stockpiles of waste and obsolete chemicals and identification of contaminated sites, for 13 Pacific Island Countries. Other Phase I activities included education and awareness programmes in each country and a review of relevant legislation.

Kiribati was a participant in Phase I of this work. A comprehensive report of this Phase I work was prepared and circulated, and significant quantities of hazardous wastes were identified in the countries visited, including estimated figures of 130 tonnes of PCB liquids and 60 tonnes of pesticides (although only about 3 tonnes of POPs pesticides). Many other hazardous wastes were also identified as well. In addition, quite a large number of contaminated sites were discovered, including six locations of buried pesticides. On the basis of this report, it was decided to proceed to the Phase II of the project, which involved the preparation of a more detailed inventory, and then collecting, transporting and disposing of the wastes, to a suitable Australian facility.

The first part (Component 1) of the Phase II work is now nearly complete, and has involved visits to each of the countries involved in the project, including Kiribati, for detailed inventories to be carried out, including testing of all stockpiled transformers.

Other work was also carried out during these visits, including improving the temporary storage arrangements where necessary, and obtaining written agreement from each country for the project to proceed. A copy of Kiribati visit report is contained in Appendix 1 below.

The most significant conclusion found from this next stage of the work is that the estimated amount of PCB contaminated oils was far too high. Instead of the expected 130 tonnes, only 12.5 tonnes were found. This presented an opportunity to include additional wastes in the project, and it was decided to collect and dispose of all the pesticides, rather than only the POPs pesticides (as well as all the PCB transformer oils that were confirmed positive). A total of 50,265 kg of pesticides will now be dealt with, including 1825 kg of POPs pesticides and 6542 kg of unknowns, some of which may be POPs pesticides.

A full inventory of all pesticides and PCB contaminated oils was prepared in November 2002 as the basis for bid invitations to appoint an Australian Management Contractor (AMC) to carry out the rest of the Phase II work. As a result, the Australian company GHD Pty Ltd was appointed as AMC. GHD is expected to start work shortly and it is important that all countries agree to a confirmed plan for implementing the rest of the Phase II work. The wastes will all go to the BCDT / SRL Plasma plant in Narangba, north of Brisbane.

AusAID have engaged the Australian legal firm of Blake Dawson Waldron ("**BDW**") and instructed them to provide advice in relation to aspects of the POPs Project. As part of this process BDW has asked SPREP to obtain from participating countries some information as presented in Section 4 below.

2. Country Inventory

(It is possible that more wastes may be found in the categories below, prior to the time of pickup. If so, these could be added to the inventory, subject to negotiation with AusAID and the AMC.)

Kiribati has no **PCB Contaminated Oils** in stockpiled transformers. Three stockpiled transformers, two switchgear units and 11 drums of transformer oil were tested with Dexsil Chlor-N-Oil 50 test kits and only one switchgear unit tested positive. It was also decided to send samples away for testing, of two transformers and the other switchgear unit, as their field tests were close to being positive. Four samples were therefore sent, and all were confirmed as negative by Hill Laboratories in New Zealand. The Dexsil kits test for all chlorine and not just chlorine in PCBs, so they are susceptible to "false positive" results.

Kiribati has had a policy of draining old transformers of their oil, dumping the transformers, and storing the oil in drums. Fortunately therefore, none of the oil in the

drums tested positive or there would have been concerns about the dumped transformers being contaminated.

One of the switchgear units (the one that initially tested positive) was located at Bikenebeu Power Station. All the other units and drums were at the Betio Power Station.

Kiribati has the following **Pesticides** to be collected:

Location	Chemical	Active Agent	Quantity	Comments
			kg	
Tawara Agricultural Store	Zinc phosphide	zinc phosphide	130	
	Unknown Liquids		400	
	Methyl bromide	methyl bromide	70	10x10kg full or party full cylinders
N.B. This material is kept in secure storage in the Tarawa Argicultural Store				
Quarantine Station	Ag 500	Diazinon	150	Liquid, packaging in poor condition
Kanton Island	Sevin	Carbaryl	236	Powder, packaging in poor condition
	Malathion		75	Liquid, packaging in very poor condition
N.B. This material is kept in an insecure store on Kanton Island.				

3. Other Project Work

There is serious waste oil contamination at both power stations (Betio and Bikenebeu). These contaminated sites were inspected and should be remediated, although are unlikely to be remediated, because of lack of funding. The environmental agency MEET regularly receives complaints about both sites and especially the Betio one, as it is in the middle of a built up area. Most of the problems have been caused by poor housekeeping and there is no excuse for the mess.

The waste bitumen at the end of the airport runway was inspected, and is a serious problem. This bitumen was abandoned by the Chinese contractors together with a pile of unwanted equipment, when they finished building the airport runway. In total there are about 1000 drums, or 500 in each in two locations, one on each side of the runway at the seaward end. Most drums have rusted and leaked forming two very large sticky slow moving black pools of bitumen. The situation has been worsened by the local Works Department removing quite a lot of bitumen from both pools and dumping it right on the

beach in two locations. The bitumen is causing both health and nuisance problems, and is polluting local village water supplies.

Several visits were made to the main hospital where there is a large amount of unwanted chemicals stored. Among other things 3 litres of diethyl ether and 2 litres of picric acid were found, and due to the potentially explosive nature of these chemicals, it was decided that they needed to be destroyed by explosion. The picric acid was the more dangerous as it was old and crystals were forming. Eventually these chemicals were exploded with the help of the Kiribati Police Force. A large amount of chemicals remain, however, and many are dangerous although not potentially explosive.

There are also surplus chemicals stored at the King George V School and possibly other schools and laboratories. Numerous non-agricultural chemicals are also being stored at the Tawara Agricultural Store.

4. Domestic Laws on Collection, Packaging, Transportation and Export of Hazardous Waste

AusAID have engaged the Australian legal firm of Blake Dawson Waldron ("**BDW**") and instructed them to provide advice in relation to aspects of the POPs Project. As part of this process BDW has asked SPREP to obtain from Kiribati (as well as all other participating countries) the following information:

- a) What are the legal responsibilities in Kiribati for persons involved in collection, packaging, transportation and disposal of hazardous wastes and who are those responsibilities allocated to by the laws in Kiribati.
- b) Who is the owner of the hazardous wastes in Kiribati.
- c) Does Kiribati have domestic legislation which allocates responsibility for POPs waste during collection, packaging and export? If so, how is this responsibility allocated? Please consider that liability and responsibility may arise from:
 - requirements to comply with clean-up notices or Government directions relating to the waste;
 - requirements to meet safety, environmental and other standards in relation to the waste; and
 - requirements to compensate others for damage to property, human health or the environment.
- d) Does Kiribati have a domestic policy in relation to providing or withholding consent under the prior informed consent provisions of the Waigani Convention (Article 6) for:

- Kiribati
 - any other Pacific Island Countries planning to 'transit' wastes through Kiribati.
- e) Has Kiribati developed a national hazardous waste management strategy in accordance with Article 4(4)(e) of the Waigani Convention? If so, how is the strategy relevant to:
- the collection, packaging, transportation and exportation of POP waste; and
 - responsibility for and ownership of the POP waste at each of the steps in (i).

Should you have any enquiries, please contact the following relevant Blake Dawson Waldron staff, Tony Hill on (02) 9258 6185 or Joanna Perrens on (02) 9258 6401 in Sydney, Australia.

5. Discussion

There have not been any transformers identified in Kiribati with PCB contaminated oil. There may, however, still be PCB contaminated oil in some of the "in service" transformers. Test kits, safety gear and sample bottles were left, to enable these transformers to be tested when shutdowns permitted, and two transformers have since been tested and found to be negative.

The pesticides stored at the Tawara Agricultural Store are all being kept securely in soundly constructed sheds. These consist of 130 kg of zinc phosphide and about 400 kg of unknowns. It is possible that not all the unknowns are agricultural chemicals, as numerous non-agricultural chemicals are also stored in the several sheds that make up the Tarawa Agricultural Store. There are also 10 x full or partly full 10 kg of cylinders of methyl bromide. If the full amount is finally taken, about 10 drums will be needed, allowing for packaging etc.

About 461 kg of various chemicals (diazinon, carbaryl and malathion) are stored in an unlocked and deteriorating shed on Kanton Island. The pesticides are in severely deteriorating packaging and much has spilt out onto the floor of the shed. These pesticides are in an old quarantine station. Kanton Island is a very remote island and is a 6-7 day boat trip from Tarawa. There is no regular shipping service and it will be necessary to charter a boat. Initial discussions with the Kiribati environmental agency MEET have indicated that the Kiribati Government may be prepared to assist with providing transport for the packaging crew to the island, as well as return transport for both the packaging crew and the packed drums. This needs to be investigated further. About 10 drums will be needed, allowing for packaging and the possibility that some contaminated soil may also need to be picked up.

6. Stockpiles of used chemicals were identified in several locations, such as schools, the main hospital, and the Tarawa Agricultural Store (which also has a stockpile of non-agricultural chemicals).

7. Actions

1. The pesticides for collection need to be isolated and secured. It needs to be confirmed with the owners / managers that these pesticides are definitely to be removed as part of the project.
2. A local management plan will need to be prepared for all local operations, including the determination of the location of the container while the collection operations are going on. This plan will need to address such issues as local transportation arrangements, local contact focal point, and the best way of carrying out consultation with Kiribati public on the local implementation of the project. This plan needs to be developed in conjunction with the AMC.
3. Local systems need to be put in place to ensure effective processing of the application from the AMC to export hazardous waste from Kiribati to Australia. This application will be lodged under the Waigani Convention. A SPREP workshop is planned for April this year to assist countries with these procedures, and a Kiribati representative should attend this workshop. (Financial assistance will be provided.)
4. Advise the relevant Agriculture Dept offices of the results of the inventories.
5. Note that it would be appropriate to do further testing to establish properly the full extent of the contamination by waste oil at the two Tarawa power stations and the bitumen at the end of the airport runway. This should be done as soon as a suitable opportunity arises, which will probably be during the preparation of the National Implementation Plan (NIP) for the Stockholm Convention. Substantial funding is available from the GEF for the preparation of the NIP.
6. Continue to safely stockpile used chemicals that are not to be picked up by the current AusAID project. It would be appropriate to find a suitable central locked storage area with proper shelving for these chemicals, and also to ensure that proper segregation of incompatibles (e.g. acids and alkalis, oxidizers and reducers, acids and cyanides) is achieved. The suggestion was made during the recent inventory visit that the Tarawa Agricultural Store could be the appropriate location for this central store as it is secure, remote and of very sound construction. It is understood, however that the Dept of Agriculture may be reluctant to give their permission for this to happen because of the fact that the chemicals may stay there for a long time before arrangements can be made for their removal.

7. Provide SPREP with appropriate responses to the BDW questions regarding Domestic Laws on Collection, Packaging, Transportation and Export of Hazardous Waste

Appendix 1

REPORT OF THE VISIT OF JOHN O'GRADY (SPREP) TO KIRIBATI FOR THE POPS PROJECT

Travel Report for MESD – Kiribati 12 – 22 April

Friday 12 April

Flew from Nadi to Tawara, Kiribati. Was met at the airport by *Noketi Karoua*, and taken back to the offices of the *Ministry of Environment and Social Development (MESD)*. At the MESD office, had meeting with Noketi, Farran Redfern, Koin Intaaki, and Paul Neilson, an Australian volunteer under the Australian Volunteers International (AVI) scheme. Went over the inventory of hazardous wastes in Kiribati, and particularly South Tarawa, and worked out a rough plan of action for the following week, including agencies and people to meet.

Picked up a rental car and then had a meeting with the *Australian High Commissioner Colin Hill*. Discussed the POPs in PICs project and AusAID's activities in Kiribati. Also discussed Christmas Island and Japan's establishment of a rocket launching site there (currently underway). The High Commission AusAID representative was unfortunately away for a week, but Colin advised that the HC was willing to assist in any way they could while I was in Kiribati.

Had a tour around South Tarawa with Paul Neilson as tour guide, and was shown some areas of environmental concern.

Monday 15 April

Had further meeting with MESD staff on the programme for the week and what the strategy should be.

Visited the *Kiribati Public Utilities Board (PUB) Betio Power Station, and met Kiriati Birita, Acting Engineering Manager*. Had meeting regarding the risks of PCBs and the importance of not throwing away transformer oils until they had been tested. (Kiriati had advised that they had only a few transformers in storage, and that they had thrown out several transformers, while keeping the oil as waste oil. We tested three old stockpiled transformers and one stockpiled switchgear unit, and all tested negative. Kiriati showed us numerous 200 litre drums of waste transformer oil, which may be contaminated with PCBs. We tested four of them and they were all negative. Paul and Koin were also trained to do the testing. The power station was heavily contaminated with waste oil, due to poor housekeeping and improper management of waste oil. MESD later in the week

received a complaint from a neighbouring resident about waste oil contamination of his property.

Visited the **Ministry of Health (at the hospital) and met Tianuare Taeuea, Senior Health Inspector** (Ph 28100x231). We discussed the POPs in PICs project and also the plans to purchase a clinical waste incinerator, as part of the SAPHE project. Tianuare asked us to return the next day when the right people were around, so we could inspect the store of lab chemicals and the quite large stocks of expired pharmaceuticals.

(The SAPHE or “Sanitation, Public Health and Environment” project is a project funded by an ADB loan, to construct new refuse disposal facilities, and upgrade sewage disposal on South Tawara.)

Tuesday 16 April

Went back to the hospital to meet Tianuare Taeuea but he wasn't there. Went to the main secondary school on the island, **King George V School and met Mere Teaabo, Lab Technician**. She had numerous boxes of chemicals stored in her laboratory, so we agreed to return in the weekend and inspect them. It was possible that other schools had similar stockpiles of chemicals, but it was agreed that I could train up a local team to do the inspection and they could visit the other schools.

Went to **Bikenebeu Power Station**, accompanied by Paul, Noketi and Farren, and tested for PCBs the one unit they had, namely a large 11 kV switchgear unit. It tested positive. Inspected the rest of the power station. Noketi and Farran were trained to do the testing. The power station was heavily contaminated with oil over large areas, because of poor maintenance practices, poor housekeeping, and mismanagement of waste oil. A Japanese contractor was constructing a new generating house for two new generators that would largely replace the existing generating capacity. I was advised that at the start of the construction work there were several old transformers stored on the site, which had been removed and dumped, but none of the power station staff knew where.

Then we went to inspect the **waste bitumen**. This waste bitumen had been abandoned by the Chinese contractors who had constructed the runway. They had left the bitumen against the wishes of the Kiribati Government. The contractors had also abandoned quite a lot of machinery that had become a liability.

The waste bitumen site was located right at the end of the runway, adjacent to the sea and right next to a village. There were about 500 drums in a very rusted condition, and most of the contents had spilt out. The bitumen was very sticky and was slowly flowing towards the village. Some of the small houses had been moved several times, away from the advancing bitumen. It was reported that one man had died recently and his death was being blamed on the well contamination from the bitumen. It was reported to be causing bad tastes and contamination in the neighbouring wells. It was apparently a reasonably frequent occurrence for cats, dogs, poultry etc, to get stuck in the bitumen and die. Probably an area of over 2000 square metres was directly contaminated at present. The

bitumen had been flowing over the road that ran alongside the runway, and the Works Dept had scraped quite a bit of it onto the nearby beach, until this practice was stopped by the Dept of Environment, so parts of the beach were heavily contaminated as well.

In the afternoon I met the **MESD Permanent Secretary Mrs Karibaiti Taoaba**. I explained the POPs in PICs project and we discussed its relevance to Kiribati. She agreed to get the Letter of Agreement signed, but she explained that it would have to be agreed to by Cabinet, which was meeting on Thursday. I offered to prepare a draft cabinet paper to accompany the LOA, and this was prepared immediately after the meeting.

Noketi and I then re-visited the Betio Power Station and tested the remaining nine drums of waste transformer oil for PCBs. They all tested negative.

Wednesday 17 April

In the morning Koin and I visited the hospital again, and met **Tebuka Toatu, Lab Supervisor and Ariane Kienene Chief Pharmacist**. We inspected the store where the expired chemicals were stored and discovered we could access only a few of them. I inspected what I could, and discovered two old containers of diethyl ether (one large and one small) – about 3 litres in total.

We then went to the Dept of Agriculture store out past the airport, and met **Nakabuta Auriaria, the Plant Protection Officer**. Nakabuta showed us the two stores of waste agricultural chemicals. It was evident that a large adjacent store would be ideal for a hazardous waste store for the whole of South Tarawa, as it had a good roof, solid walls and could easily have a lock fitted. I suggested the idea to Koin and she and Paul later that day drafted a letter for the MESD Permanent Secretary to sign, for the Permanent Secretary of Natural Resources Development, suggesting this store to be used for keeping safely all the hazardous wastes on the South Tawara.

I spent the afternoon in bed with a stomach infection.

Thursday 18 April

Visited the hospital again with Paul and disposed of the larger diethyl ether container. The smaller bottle had a crown top so I decided to leave that for disposal by a safer method. Then inspected the remaining chemicals that had been uncovered, and discovered about 50 kg of a large variety of mixed chemicals, including nitric, phosphoric and sulphuric acids, caustic soda, phenol, xylene, xylol, ammonia, potassium dichromate, acetone, many salts, about 200 gms of trichloroacetic acid, and 2.5 litres of chloroform.

Also discovered about 2 litres of a saturated solution of picric acid in a 2.5l container. Arranged a meeting with the police explosives expert to dispose of this, as well as the small bottle of diethyl ether.

Went back out to the *Dept of Agriculture* store with Paul and made an inventory of the stocks of chemicals and expired agricultural chemicals kept there. The most significant were about 35 plastic pails (in bad condition) of CCA timber treatment chemical, with an average of about 10 kg in each pail. There was also about 400 kg of coumarin based rat poison, which was still being used. There were many smaller bottles and containers of chemicals that did not appear to have originated at the Dept of Agriculture, including a range of acids, alkalis and salts, formic acid, acetic acid, propanol and glycerol. There was about 50 kg of zinc phosphide, 40 kg of derris dust, and about 10 full or partly full cylinders of methyl bromide gas.

In the afternoon we met the *police explosives expert Ioanne ??* and discussed the picric acid and diethyl ether at the hospital. We agreed to meet the next day at the hospital.

Then we visited the *Kiribati Oil Company (KOIL)*, which has a management contract with Mobil Oil, and met *Taka Erasito, the Depot Manager*. The site was well run and tidy, and we discussed Mobil's environmental and OSH policies, which included accepting the return of used oil. KOIL had about 300 drums of waste oil stockpiled, mainly from the PUB and small amounts from others. At present, PUB at its two power stations, were generating about 10 drums of waste oil per month, and with the new generating units coming on line in a few months, this was expected to increase to up to 20 drums a month. Taka had been advised that the Fiji Steel Mill was no longer receiving waste oil, and KOIL had been exploring the possibility of purchasing a waste oil reprocessing unit from Australia at the cost of about \$160,000. The unit heated the waste oil up to about 350⁰C, distilled off a usable diesel product, and flared off the off-gases. Apparently it left a residue of only about 1% of the original product (refer www.globalspill.com.au). A phone call to Mobil in Fiji clarified the Steel Mill situation, however. The mill had recently been taken over by Fletcher Steel and the change in ownership had temporarily halted the acceptance of the waste oil. The mill was now, however, accepting waste oil as before.

Friday 19 April

Today was a holiday in Kiribati – Health Day

Met the Kiribati explosives expert Ioanne on site at the Hospital, inspected the picric acid and diethyl ether and agreed upon a plan of action for the disposal.

Also caught up on reports and emails.

Saturday 20 April

Kept an appointment at the King George V School with Mere Teaabo, to sort out her surplus chemicals. Unfortunately she did not turn up. We went and visited her house, but she had gone away for the day. I agreed with Farran and Noketi that they could arrange another meeting with Mere later, together with Paul, to do this work, and the chemicals could be taken to the central hazardous waste store, once this was set up.

Then went to the hospital for the pre-arranged meeting with Ioanne, to destroy the picric acid and the ether. Eight policemen showed up, but unfortunately Ioanne did not.

While we were waiting at the hospital, Paul and I noticed how the clinical waste at the hospital was being disposed of. Holes were being dug on the beach, and infectious and other dangerous clinical wastes were dumped in these holes and set on fire. In the incident we observed, the wastes were left unburnt and unattended for quite a while, and children and dogs were close by. When the wastes were set on fire, this was not done in a very thorough fashion.

Sunday 21 April

We tried again with the picric acid and ether destruction and this time succeeded. Paul and I met Ioanne and several policemen later in the afternoon, and took the chemicals to the end of the airport runway where they were successfully exploded.

We also found another area of *bitumen contamination* on the opposite side of the runway to the first pile we had inspected, and this rusted stockpile of drums was at least as large as the one on the other side (i.e. about 500 drums). The area of contamination was about 1000 square meters, and some of the bitumen had also been removed to the nearby beach. This old stockpile was right next to the large rusting asphalt production plant that was used to construct the runway. Clearly the Chinese contractors had just abandoned everything they no longer wanted when they had completed the project.

Monday 22 April

Arrived at the Airport early and checked in. Then went back to the MESD and left test kits, safety gear and sample bottles with Paul, so that in-service transformers could be tested and surplus chemicals packed up.

Later on the plane to Fiji, I sat next to Karibaiti Taoaba for a while and she signed the LOA, as the Cabinet had agreed to this being done, on the previous Thursday. We also discussed environmental problems in Kiribati, and especially waste management problems.

Recommended Actions

- 1. Test all the in-service transformers for PCB contamination, whenever PUB shutdowns permit. Make an inventory of all the transformers on a spreadsheet,***

- and take oil samples from the transformers that test positive. Send the inventory and the samples to John O'Grady at SPREP. (MESD)*
- 2. Secure permission to use the Dept of Agriculture Store as a hazardous waste store for all the stored and surplus chemicals and other hazardous wastes (e.g. batteries) as appropriate. For example all the surplus chemicals from the hospital and the schools could be sent to this store. (MESD)*
 - 3. Investigate all feasible options for disposing of the bitumen, and check out the possible environmental impacts of the current situation. (ALL)*
 - 4. Prepare and implement a waste oil collection scheme for shipment of waste oil to Fiji, in conjunction with KOIL. (MESD and KOIL).*
 - 5. Aim to prevent further serious waste oil contamination from Betio and Bekenibeu power stations (MESD), and investigate ways in which the existing contamination could be cleaned up (ALL).*
 - 6. Sort out the surplus chemicals at the KGV School and any other secondary schools that may have these chemicals stored. Send these chemicals to the hazardous waste store, when this store has been obtained. (MESD)*
 - 7. Encourage the hospital to commission one of the JICA incinerator units stored at the hospital, and use it at the hospital until a larger unit is provided by the SAPHE Project. This will solve the immediate problem of unsatisfactory clinical waste disposal, and will provide real operational experience with the JICA units before they are sent to the outer islands. (MESD)*
 - 8. Once a satisfactory hazardous waste store is obtained, place the Hospital laboratory chemicals into safe storage in this store. (MESD)*
 - 9. Assess how many old batteries have been collected on the outer islands, and what type they are. If a large enough hazardous waste store can be obtained, (and if it is feasible), arrange for these batteries to be brought to this hazardous waste store. (MESD)*
 - 10. Try to make contact with someone on Kanton Island, to determine whether any pesticides have been abandoned there. (MESD)*
 - 11. Once all the data is available, prepare recommendations to AusAID, regarding removal of POPs and other hazardous wastes from Kiribati. (JOG, SPREP)*