**Federated States of Micronesia**

**Updated National Implementation Plan**

**for the**

**Stockholm Convention**

**on**

**Persistent Organic Pollutants**



**The original twelve and sixteen more sneaky bad guys!**

**FSM Department of Environment, Climate Change and Emergency Management**

**September 2020**

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# ACRONYMS

BAT/BEP Best Available Technology/Best Environmental Practices

CCS Chuuk Conservation Society

CHK Chuuk

COM-FSM College of Micronesia – Federated States of Micronesia campuses

CSP Conservation Society of Pohnpei

DECEM Department of Environment, Climate Change and Emergency Management

EPA Environmental Protection Agency

FSM Federated States of Micronesia

GEF Global Environment Facility

HWAPWG Hazardous Waste Awareness Program Working Group

KCSO Kosrae Conservation and Safety Organization

KIRMA Kosrae Island Resource Management Authority

KSA Kosrae

MCT Micronesia Conservation Trust

NACPCM National Advisory Committee for POPs Chemical Management

NG National Government

NGOs Non-Governmental Organizations

NSWMPDTF National Solid Waste Management Policy Development Task Force

PICs Pacific Island Countries

PNI Pohnpei

POL Petroleum Oil Lubricants

POPCDTF POPs Curriculum Development Task Force

POPs Persistent Organic Pollutants

SAD Self Assessed Declaration (Customs Import Declaration form)

SPC Secretariat of the Pacific Community

SPREP Secretariat of the Pacific Regional Environment Program

SWOT Strengths Weaknesses Opportunities Threats

TNC The Nature Conservancy

TTPI Trust Territory of the Pacific Islands

UNDP United Nations Development Program

UNEP United Nations Environment Program

uPOPs Unintentional Persistent Organic Pollutants

WHO World Health Organization

WTO World Trade Organization

**FOREWORD**

Being a small island developing state (SIDS) with limited large industries such as manufacturing has its advantages. The Federated States of Micronesia (FSM), being one such SIDS, is blessed with a relatively pristine environment that is not subjected to the threats associated with such economic activities - and fortunately so - as the fragile environment is already facing enormous threats including the threat of climate change. Vulnerability of the FSM environment requires us to be diligent in doing our part in minimizing the threats while also collaborating with our global community to undertake collective efforts to address threats beyond our control – one of which is Persistent Organic Pollutants (POPs) being addressed under the global Convention: **Stockholm Convention on Persistent Organic Pollutants**.

The ratification of the Stockholm Convention embodies a country’s commitment towards the protection of global human and environmental health against the adverse effects of Persistent Organic Pollutants (POPs). By ratifying the Convention, FSM joins the global community (128 countries) in taking appropriate measures to reduce and eliminate the release of POPs chemicals into the environment. A requirement of the Convention is the development of National Implementation Plans (NIP) that provides an assessment of the current inventory and legal instrumental aspects of POPs management in a country. I am pleased to present this FSM NIP recently updated with the help of relevant stakeholders across the FSM.

Although the FSM does not have POPs-producing industries or factories for manufacturing synthetic chemicals, the current assessment of POPs inventory is based on new POPs through the amendments adopted up to COP 8. The NIP was prepared based on guiding documents provided by the Stockholm Convention Secretariat and serves as a framework for the future management of POPs (and other) chemicals in the FSM.

We consider the Updated National Implementation Plan as a living document subject to change to align with relevant national policies and strategies, taking into consideration any new future POPs chemicals added to the Stockholm Convention. The experience and lessons learnt in this process will be critical in future reviews of the National Implementation Plan, and its effectiveness in the FSM.

The cooperation and support of all the stakeholders, including state and national level government agencies and public utilities corporations has been critical in the successful preparation of the Updated NIP. Our gratitude to the United Nations Environment Programme (UNEP) and the Global Environment Facility (GEF) for the funding and technical support provided towards the development of this document.

I express my deep gratitude to key stakeholders at all levels and consultants in preparing the Updated NIP. I also acknowledge the crucial lead roles played by the State Environmental Protection Agencies (EPAs) and Kosrae Island Resource Management Agency (KIRMA) in the development of this NIP, a leadership role that becomes vital for the most important aspect of this plan which is its implementation to improve chemical and waste management in the country.

*Honorable Andrew R. Yatilman*

*Secretary, Department of Environment, Climate Change and Emergency Management*

# ACKNOWLEDGEMENTS – INDIVIDUALS WHO PROVIDED ASSISTANCE

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# EXECUTIVE SUMMARY

**Overview of Stockholm Convention and FSM’s relationship**

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted at a Conference of Plenipotentiaries on 22 May 2001 in Stockholm, Sweden. FSM ratified the Stockholm Convention on POPs on July 15, 2005. This current update and review of the National Implementation Plan (NIP) for the Stockholm Convention on POPs in the FSM is a project that will create the enabling conditions to allow FSM to comply with our obligations as a Party under the Stockholm Convention.

**Country Profile**

The Federated States of Micronesia (FSM) is a developing nation comprised of 607 islands spread across more than one million square miles of the Western Pacific Ocean, just north of the equator. While the FSM covers a large area of the ocean (the east-west dimension is approximately 2,000 miles), the total land area is small, about 271 square miles. A total of more than 2,776 square miles of lagoon areas exist among the islands. The country is divided into four states, Kosrae, Pohnpei, Chuuk, and Yap, with the national government offices located on Pohnpei. States are further politically (and in some areas culturally and linguistically) divided into municipalities and villages. Maps of the country and states are available on many websites.

Geologically, most of the inhabited islands of the FSM are volcanic in origin, and include both high island and low atolls. The high islands have rainforest covered mountains rising to more than 2,500 feet, with steep slopes and deep valleys, both broad and narrow coastal plains, mangrove swamps, and are fringed by coral reefs. Most of the “outer” islands of the FSM are low coral atolls, some tiny and a considerable distance (three or more days on the field trip ship) from the state centers. The climate throughout the FSM is tropical with an average daytime temperature around 80 degrees (F), a relative humidity from 70 to 90 percent, and, depending on location, an annual rainfall of up to 200 inches or more. The high islands of Kosrae, Pohnpei, and those in Chuuk State receive an average of eight to 12 inches of rain per month during most of the year. Yap Island has a bit less rain and more pronounced wet and dry seasons.

The nation’s atolls have fresh-water lenses, which can be threatened by drought, pollution, and, in times of severe storms, salt water contamination. Atoll populations must practice more serious water conservation than their neighbors on the high islands. The 1998’s El-Nino caused drought conditions on all of the FSM islands and atolls. Lack of rain for several months caused all but the largest flowing streams on the high islands and most water sources on the atolls to dry up. Low lying areas on the high islands, and all of the nation’s atolls, are susceptible to flooding during typhoons, tropical storms, and unusually high tides.

**Description of POPs**

POPs chemicals are toxic, persist in the environment, bio-accumulate in the food chain, and have trans-boundary transportation capabilities, often ending up in locations distant from their source locations. The ability to bio-accumulate and bio-magnify in human populations (and populations of animals near the top of the food chain), and the ability to travel in the environment to far-removed from the source of their generation makes these substances dangerous to populations that have nothing to do with these toxic substances.

The 28 POPs chemicals and groups of chemicals managed under the Convention (see the table on page 20) include pesticides, industrial chemicals, and unintentionally produced POPs (uPOPs).

These chemicals are listed under three Annexes as follows:

Annex A: These chemicals are mainly, but not exclusively, pesticides scheduled for elimination. Parties may register specific exemptions to continue the use of Annex A chemicals to allow for the time that may be needed to adapt and take necessary management measures required by the Convention.

Annex B: Parties must take measures to restrict the production and use of these chemicals. Parties may register specific exemptions or restrict use of Annex B chemicals to an “acceptable purpose” as listed under the Convention.

Annex C: These chemicals are produced unintentionally due to incomplete combustion, and during the manufacture of pesticides and other chlorinated substances. They are emitted mostly as a by-product of the incineration of hospital waste, municipal and other hazardous waste, from automobile emissions, and the combustion of biomass including coal and wood. Parties must take measures to reduce the unintentional release of chemicals listed in this Annex, with the goal of continuous minimization and, where feasible, ultimate elimination.

**The FSM’s obligations as a Party to the Convention**

Referring to Convention Article 3

Eliminate the importation, production, use, and export of chemicals listed in Annex A except where authorized under the Convention, and restrict the production and use of chemicals listed in Annex B.

Referring to Convention Article 5

Reduce or eliminate unintentional production and release of Annex C chemicals

Referring to Convention Article 6

Reduce or eliminate releases from stockpiles and wastes containing chemicals listed in Annexes

A, B and C, including identification of products or articles in use and sites contaminated with these chemicals

Referring to Convention Article 9

Establish mechanisms to exchange information on POPs between Parties and the Secretariat

Referring to Convention Article 10

Promote awareness of POPs among policy and decision makers and educate the public on the issue.

Referring to Convention Article 15

Participate in periodic reporting to the Conference of Parties (COP) Secretariat on the status and

measures on POPs reduction undertaken nationally

Referring to Convention Article 16

Participate in the Global Monitoring Plan on POPs for the national presence of chemicals listed in

Annexes A, B and C, as well as their global and environmental transport.

**How were the POPs examined?**

This document includes a full listing of the 28 POPs, including some that the FSM has not yet ratified. Information was gathered from several on-line sources, including the Centers for Disease Control and Prevention website, the Agency for Toxic Substances and Disease Registry, and the website of the Organization for the Sound Management of Chemicals. The document lists information about the following characteristics of POPs and UPOPs.

* Trade Names, Other Names and Synonyms
* Description of the physical characteristics of the substance
* Impact of the POP chemical on humans, animals, and the environment
* Status of the chemical, including national and international laws and regulations
* The status of the use of the chemical in the FSM
* Other matters appropriate to gain overview on the development of the updated FSM NIP which are relevant to the use and/or management of these substances.

**Gaps and/or Limitations**

One of the problems associated with the collection of POPs related data is that comprehensive surveillance systems have not been developed. The FSM, as explained above is a very small Pacific Island Country (PIC), with very limited land area, and a small, widely dispersed population. The collection of information about the import, storage, handling and use, clean up, and disposal is simply not done for almost all of the POPs chemicals. The reasons include the small amounts involved, systems for data collection focus only on select items with some significance that is either financial or a high profile negative health issue. The fact that island environments are extremely fragile and that POPs exposures can destroy marine and terrestrial locations is not understood by most of the population, so effective efforts are hard to maintain.

Additionally, addressing POPs related issues can be prohibitively expensive, well beyond the budget capacities of most PICs.

**Use of the Toolkit to quantify uPOPs emissions**

The collection of data related to POPs substances was planned to be completed in early 2020 and a trip to Kosrae State was completed in early March. During this week in Kosrae, visits were made to all the location where POPs might be found including the dumpsite, road construction company, hardware stores, the hospital, the dry-docking facility, the airport, laboratories at the high school and College of Micronesia Campus, and a small processing facility which manufactures paper and other items from banana plants. As was the case during the first POPs effort in 2006, very little of the import and/or use of POPs chemicals was discovered. Training on data collection was provided to an individual from The Environmental office KIRMA (Kosrae Island Resources Management Authority.

On 16 March 2020, air travel to and from the various FSM and other Micronesian jurisdictions ceased, due to the COVID-19 situation. These restrictions prevented POPs inventory trip to visit Chuuk and Yap states. It was possible, however, to conduct the inventory work in Pohnpei State. Thus, similar activities were done as in Kosrae, with visits to locales where potentially POPs might be found. The tool inventory spreadsheets reflect what was found in Kosrae and Pohnpei. In some instances population ratio figures were used to determine estimates for Chuuk and Yap states for activities, such as power generation, and fuel consumption. This then enabled the calculations of national estimates of uPOPs and indicate our total gTEQ/a across all categories.

The POPs inventory spreadsheets are found in Annex 2.

**Related issues and our action plans**

Six revised action plans, based in the original six from 2006 were created. These are included in Annex 3. These plans are relevant to the existing circumstances in a small island nation like the FSM, with its small population, limited land area, fragile environment, and almost non-existent manufacturing sector. A time-framed spreadsheet listing the estimated financial costs and human resource needs for the project is also included in Annex 4.

# Introduction

The Federated States of Micronesia (FSM) is a developing nation comprised of 607 islands spread across more than one million square miles of the Western Pacific Ocean, just north of the equator. While the FSM covers a large area of the ocean (the east-west dimension is approximately 2,500 miles), the total land area is small, about 271 square miles. A total of more than 2,776 square miles of lagoon areas exist among the islands. The country is divided into four states, Kosrae, Pohnpei, Chuuk, and Yap, with the national government offices located on Pohnpei. States are further politically (and in some areas culturally and linguistically) divided into municipalities and villages.

As the variety and quantity of all chemical imports to the FSM increase, problems related to these chemicals are expected to increase as well. Most often, hazardous chemical problems have to be solved individually, and efforts must be focused on problems of priority concern. Given their long range transport, no government acting alone can protect its citizens or its environment from POPs. In response to this global problem, the Stockholm Convention requires its parties to take measures to eliminate or reduce the release of POPs into the environment.

The FSM Congress completed ratification of the treaty in February 2005. At ratification, The Federated States of Micronesia declared in accordance with the provisions of article 25, paragraph 4 of the Stockholm Convention on Persistent Organic Pollutants, that any amendment to Annex A, B or C shall enter into force only upon the deposit of the Federated States of Micronesia's instrument of ratification, acceptance, approval or accession thereto.

## 1.1 Stockholm Convention obligations

The Stockholm Convention on Persistent Organic Pollutants is an international treaty that was adopted in 2001 and entered into force in 2004. At that time, it identified twelve of the most dangerous chemicals, which have been labeled Persistent Organic Pollutants, or POPs. The Stockholm Convention calls for the halt in production, reduced use, minimization of emissions, and eventual elimination of these chemicals. Since 2004 up to 2017, 16 new POPs have been added to the Annexes of the Stockholm Convention, as presented in Table 1 below. The POPs listed in the Annexes to the Convention in 2015 and 2017 were not yet ratified by FSM.

**Table 1. *The 28 POPs chemicals and groups of chemicals listed in the Stockholm Convention (as of 2017)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | NAME/DESCRIPTION  (\* = Original Twelve)  (ᵻ = Not ratified by the FSM) | CAS # | ANNEX(S) | DATE LISTED | PESTICIDE | INDUSTRIAL CHEMICAL | BY- PRODUCT |
| \*1. | Aldrin | 309-00-2 | A | May 2004 | X |  |  |
| \*2. | Chlordane | 57-74-9 | A | May 004 | X |  |  |
| \*3. | Dieldrin | 60-57-1 | A | May 2004 | X |  |  |
| \*4. | Endrin | 72-20-8 | A | May 2004 | X |  |  |
| \*5 | Heptachlor | 76-44-8 | A | May 2004 | X |  |  |
| \*6 | Hexachlorobenzene (HCB) | 118-74-1 | A & C | May 2004 | X | X | X |
| \*7 | Mirex | 2385-85-5 | A | May 2004 | X |  |  |
| \*8 | Toxaphene | 8110-35-2 | A | May 2004 | X |  |  |
| 9 | Chlordecone | 143-50-0 | A | May 2009 | X |  |  |
| 10 | Alpha-hexachlorocyclohexane | 319-84-6 | A | May 2009 | X |  |  |
| 11 | Beta-hexachlorocyclohexane | 319-85-7 | A | May 2009 | X |  |  |
| 12 | Lindane | 58-89-9 | A | May 2009 | X |  |  |
| 13 | Pentachlorobenzene | 608-93-5 | A & C | May 2009 | X |  | X |
| ᵻ14 | Pentachlorophenol and its salts and esters | 87-86-5, 131-52-2, 27735-64-4, 3772-94-9, 1825-21-4 | A | May 2015 | X |  |  |
| 15 | Technical endosulfan and its related isomers | 959-98-8, 33213-65-9 | A | My 2011 | X |  |  |
| 16 | Perfluorooctane sulfonic acids and salts and Perfluorooctane sulfonyl fluoride | 1763-23-1, 307-35-7 | B | May 2009 | X | X |  |
| \*17 | Dichlorodiphenyltrichoroethane (DDT) | 50-29-3 | B | May 2004 | X |  |  |
| \*18 | Polychlorinated biphenyls (PCB) | 1336-36-3 | A & C | May 2004 |  | X | X |
| ᵻ19 | Decabromodiphenyl ether (commercial mixture, c-decaBDE) | 1163-19-5 | A | May 2017 |  | X |  |
| 20 | Hexabromodiphenyl ether and heptabromodiphenyl ether | 68631-49-2, 207122-15-4, 446255-22-7, 207122-16-5 | A | May 2009 |  | X |  |
| 21 | Tetrabromodiphenyl ether and pentabromodiphenyl ether | 5436-43-1, 60348-60-9 | A | May 2009 |  | X |  |
| 22 | Hexabromobiphenyl | 36355-01-8 | A | May 2009 |  | X |  |
| 23 | Hexabromocyclododecane | 25637-99-4 3194-55-6 | A | May 2013 |  | X |  |
| ᵻ24 | Hexachlorobutadiene | 87-68-3 | A | May 2015 |  | X |  |
| ᵻ25 | Polychlorinated naphthalenes | 70776-03-3 | A & C | May 2015 |  | X | X |
| ᵻ26 | Short-chain chlorinated paraffins | 85535-84-8 | A | May 2017 |  | X |  |
| \*27 | Polychlorinated dibenzo-p-dioxins (PCDD) | N/A | C | May 2004 |  |  | X |
| \*28 | Polychlorinated di-benzofurans (PCDF) | N/A | C | May 2004 |  |  | X |

The 28 POPs chemicals and groups of chemicals managed under the Convention (Table 1) include pesticides, industrial chemicals and unintentionally produced POPs (uPOPs), which are listed under three Annexes as follows:

• Annex A: these chemicals are mainly, but not exclusively, pesticides scheduled for elimination; Parties may register specific exemptions to continue the use of Annex A chemicals to allow for the time that may be needed to adapt and take necessary management measures required by the Convention.

• Annex B: Parties must take measures to restrict the production and use of these chemicals; Parties may register specific exemptions or restrict use of Annex B chemicals to an “acceptable purpose” listed under the Convention.

• Annex C: these chemicals are produced unintentionally due to incomplete combustion, and during the manufacture of pesticides and other chlorinated substances. They are emitted mostly as a by-product of the incineration of hospital waste, municipal and hazardous waste, from automobile emissions, and the combustion of biomass including coal and wood. Parties must take measures to reduce the unintentional release of chemicals listed in this Annex, with the goal of continuous minimization and, where feasible, ultimate elimination.

In addition to POPs, other potentially hazardous substances are imported into, used, stored, and disposed of, in the FSM. The majority of these chemicals are included as an ingredient in pesticides, cleaning agents, and many other imported items, however there is no production of these items in the FSM. For the most part, not quite as dangerous as POPs, these chemicals can still pose a threat to human health and/or the environment. From observation, we know that many of these substances are already being sold in the Micronesian islands.

## 1.2 NIP development process

The purpose of the FSM’s NIP is to, in compliance with the terms of the Stockholm Convention, provide the country with an effective and sustainable chemical management infrastructure in order to manage POPs chemicals at all stages of their life cycle. The efforts aim to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health or on the environment. Exposures to POPs lead to serious health issues: cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to diseases of the central and peripheral nervous systems.

The first submission of an FSM National Profile and the FSM National Implementation Plan was completed in 2006. The mechanism used to develop the original submission was to create a national working group to oversee the activity and secure the services of a consultant to collect information from the four states, and then compile the National Profile and suggest topics to be included in the NIP. The national working group, comprised of representatives of appropriate government and non-government entities, met in late 2006 to develop the FSM’s NIP.

For this 2019/2020 update of the FSM NIP, a similar mechanism was planned. A program coordinator was recruited at the national level and a consultant (same one as for the original NIP work) was retained. The coordinator and the consultant were able to visit Kosrae State to work with staff of KIRMA (Kosrae Island Resource Management Authority (similar to EPA) to complete a POPs inventory and meet with potential Kosrae State working groups members.

Unfortunately, at this time the early effects of the COVID-19 pandemic resulted in the shutdown of air travel in the FSM and surrounding jurisdictions, preventing visits to the FSM states of Chuuk and Yap. In April, May, and June inventory work was done in Pohnpei State since no air travel would be necessary.

Stakeholder groups were formed in each state to review the updated the NIP and to coordinate further POPs-related activities in each state. Members of each state’s stakeholders group would represent the state level at national meetings. Meetings in the states can be conducted face-to-face with representatives of the national government participating via video. National level meeting will be video based until air travel is once again an available option.

## 1.3 Structure of the NIP

This NIP contains three chapters including this introductory chapter.

Chapter 1 of the NIP sets the country context by providing an overview of the social, economic, and environmental conditions of FSM. Where relevant, the potential contribution of national activities to POPs releases and the potential impacts of POPs on national activities have been highlighted. Chapter 2 also summarizes the national policy, regulatory and institutional environment within which POPs are managed.

Chapter 2 of the NIP presents the findings of the national inventory on POPs, which was conducted as part of the NIP update process. Where necessary, inventory findings have been supplemented with additional desktop research and analysis to fill national data gaps.

Chapter 3 contains the Strategy and Action Plan elements of the NIP. Each Action Plan is costed and identifies a lead implementing agency, who will be responsible for driving the national implementation of the corresponding activities.

## 1.4 Gender considerations

It is now widely recognized that development and governance processes will not be effective or sustainable until women and men participate in and benefit from such processes on a basis of both formal and substantive equality. Despite this, women continue to be significantly under-represented in governance and development processes and experience discrimination and diminished opportunity in virtually all development sectors. Contrary to a wide range of commitments that Pacific Island governments have made to achieving equality between men and women, women’s needs, issues, perspectives and contributions continue in many cases to be on the periphery of development and governance dialogue (Secretariat of the Pacific Community, 2012[[1]](#footnote-1)).

Participation of women at the highest levels of decision making remains very limited in FSM. Women continue to be absent from the national legislature and have never served as President of Vice President. Over the years however, women have headed several executive branch cabinet departments including the Departments of Finance and Administration, Health and Social Affairs, Education, and Justice. Many of the nation’s health and education programs are managed by women. Currently, there are no female national cabinet members.

The FSM National Congress is composed of 14 seats; none has ever been filled by a woman, although women have been candidates in several elections during the last 25 years. In 2011, the FSM Congress introduced a bill (FSM Bill No. 16–10) to reserve four seats out of the 14 for women. At that time the initiative was not widely supported by women’s groups in that they did not want to accept a seat in Congress under special circumstances, but rather wanted to represent their constituencies based upon the same eligibility criteria as their male colleagues.

Women have fared somewhat better at the state level, although to date none has served as a governor or a lieutenant governor. State legislatures have seated women senators. There have been six women senators in Pohnpei, beginning in the mid-1990s and three serving in the current legislature. To date, the Chuuk State Legislature has seated one woman senator since the mid-1990s, Yap two, and Kosrae none.

Micronesian societies, with the exception of Yap and a few atolls in Pohnpei, emphasize matrilineal descent where identities, titles, rights and acquisition to property are traced through female hereditary lines. Women’s rights to land ownership and their access to resources have, however, changed under the various colonial authorities that have governed FSM, with most decision making related to land ownership and land use being retained by male members of the family. Other barriers to full participation in public decision making and participation at the higher government level include the lack of opportunity to undertake leadership training and the lack of support for women wanting to move into roles that have traditionally been dominated by men. Leadership at the national, state, and municipal levels is interwoven with a strong attachment to traditional forms of local leadership, in which women are not highly represented (Secretariat of the Pacific Community, 2012).

The first POPs in PICS program in the FSM was housed in the FSM Department of Health, Education and Social Affairs (as the department was known then) and headed by a woman. This current effort to complete a 2019/20 up-date of the program is housed by the new DECEM department and was originally managed by a woman, until she departed to another position. Women manage many of the DECEM activities and, as heads of the state EPA offices, are deeply involved in this project. The stakeholders groups include many women in several sectors and these groups also include representatives of women’s non-government organizations. Women are the priority populations for some of the POPs awareness activities. In these varying capacities women have been involved in the planning, designing, and review of the up-dated POPs program.

## 1.5 Socio-economic considerations

### 1.5.1 Background

Socio-economic impact analysis is one of the key components of the complex management process in which risks resulting from environmental contamination by chemicals are identified and assessed[[2]](#footnote-2). The aim of socio-economic analysis within the field of chemical risk management is to assist the decision-making process by making explicit the implications of choosing one risk management option over another. Within the NIP context, this helps inform decision makers of the social and economic costs and benefits of reduction in POPs use and exposure through implementation of the Stockholm Convention requirements[[3]](#footnote-3). A transparent socio-economic analysis can help inform decision makers and stakeholders of what will be involved in terms of positive and negative effects, both across social groups and across the economy[[4]](#footnote-4). A risk assessment helps characterize the risk posed by chemical exposure (to humans and to the environment) and a socio-economic analysis evaluates change within the socio-economic situation based on various combinations of potential risk mitigation measures. In the context of risk management of chemical exposure, the social and economic impacts may include impacts on human health; impacts on the environment; and impacts on economic development[[5]](#footnote-5),[[6]](#footnote-6). Whilst all three aspects are important, the minimization of the impact of POPs chemicals on human health is typically paramount, especially for the general population and for workplace exposure[[7]](#footnote-7).

### 1.5.2 Assessment methodology

A socio-economic impact analysis of POPs management under the Stockholm Convention should encompass:

1. The characterization of the societal problems leading to POPs use (identified during the NIP inventory baseline);
2. The characterization of the impacts of POPs use (identified during the NIP inventory baseline);
3. The assessment of the impacts (positive or negative) of producing or using specific POPs, or being exposed to unintentionally released POPs (identified during the NIP inventory baseline);
4. The analysis of alternative/best practice management options (identified during the NIP inventory baseline);
5. The analysis of the economic and social effects and the cost of POPs reduction or phase-out;
6. Recommendations on meeting the social and economic cost of controlling or banning POPs.

### 1.5.3 Socio-economic assessment in FSM

A systematic qualitative analysis, where the relative magnitude, significance and relative importance of the risks, costs and benefits are described but not quantified was used to complete the FSM NIP update assessment (Table 2).

Table 2. FSM socio-economic assessment summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **POPs** | **Risk** | **Proposed NIP management action** | **Human health benefit** | **Environment benefit** | **Relative cost implication** |
| POPs Pesticides | High, due to run off caused by heavy rains and fragile marine eco-systems | Monitoring of all aspects of POPs chemical life-cycle | This action protects human health from potential effects on endocrine and immune system, liver, reproductive system and the cancer impacts of POPs | This action will help to protect the environment from the impacts of POPs | ████  Need to establish more effective monitoring procedures |
| Agricultural Pesticides | High, due to run off caused by heavy rains and fragile marine eco-systems | Monitoring of chemicals to verify no POPs included | This action protects human health from potential effects of hazardous chemicals | This action protects the local environment from potential effects of hazardous chemicals | ████  Costs included in activity above |
| POP-PBDEs | Medium, due to small number of these items in-country | Improved domestic waste management; improved e-waste management; Improved end-of-life vehicle management; continued monitoring | These actions protect human health from potential negative health effects caused by exposure to these hazardous POPs chemicals | Prevent further loss of PBDEs to soil and water (rivers, groundwater, ocean) | ████  Listed improvements will require near-future funding |
| HCBDs | Medium, due to small number of these items in-country | Testing of potentially contaminated soil and water sites; Clean up and storage for eventual disposal of HCBD contaminated substances as necessary | These actions protect human health from potential negative health effects caused by exposure to these hazardous POPs chemicals | Prevent further loss of PBDEs into soil and water environments (rivers, groundwater, near-shore marine, and ocean) | ████  Additional funds required if testing and clean-up is necessary |
| PCNs | High, due to relatively frequent open burning of domestic waste at the household level | Minimize uPOPs releases from incineration and open burning | Minimize exposure to dioxins, furans, and other uPOPs | Minimize release of dioxins, furans, and other uPOPs to the air/water environments | ████  Current burning practices are increasing exposures at this time |
| SCCPs | Low, due to small number of these items in-country | Monitoring of imports to ensure that SCCPs chemicals are not introduced. Testing of potentially contaminated sites | Minimize exposure, possible carcinogen | Prevent further loss of SCCPs into soil & water environments (rivers, groundwater, near-shore marine, and ocean) | ████  Costs included in activity above |
| DDT | Low, due to very infrequent in-country demand | Monitoring of import and use, proper notification when use exemption is requested | Prevent human exposure to DDT | Prevent any loss of DDT into terrestrial/soil and water/marine environments | ████  No anticipated use of DDT |
| PFOS | Medium, due to small number of these items in-country, however PFOS continued to be produced intentionally and unintentionally | Monitoring of imports to ensure that PFOS chemicals are not introduced. Testing of potentially contaminated sites | Eliminate or minimize exposure, due to serious negative health effects and possible carcinogen | Prevent any loss of PFOS into terrestrial/soil and water/marine environments | ████  Additional funds required if testing and clean-up is necessary |
| uPOPs | Medium, due to small number of these items in-country, however PFOS continued to be produced intentionally and unintentionally | Minimize open burning; increase e-waste recycling; minimize incineration; minimize cooking with treated wood; strengthen motor vehicle pollutant emission standards; reduce national tobacco smoking rates | Eliminate or minimize exposure due to serious negative health effects | Minimize unintentional uPOPs loss into environment | ████  Additional funds required if testing and clean-up is necessary |

* \*Green: no additional cost; Orange: eventual cost increase; Red: immediate cost increase

# Country baseline

## 2.1 Country profile

### 2.1.1 Geography and population

The Federated States of Micronesia (FSM) is a developing nation comprised of 607 islands spread across more than one million square miles of the Western Pacific Ocean, just north of the equator. While the FSM covers a large area of the ocean (the east-west dimension is approximately 2,000 miles), the total land area is small, about 271 square miles. A total of more than 2,776 square miles of lagoon area exists among the islands. The country is divided into four states, Kosrae, Pohnpei, Chuuk, and Yap, with the national government offices located on Pohnpei. States are further politically (and in some areas culturally and linguistically) divided into municipalities and villages. Maps of the country and states are included in Annex 3. Geologically, most of the inhabited islands of the FSM are volcanic in origin and include both high islands and low atolls. The high islands have rainforest covered mountains rising to more than 2,500 feet, with steep slopes and deep valleys, both broad and narrow coastal plains, mangrove swamps, and are fringed by coral reefs. Most of the “outer” islands of the FSM are low coral atolls, some tiny and a considerable distance (three or more days on the field trip ship) from the state centers. The climate throughout the FSM is tropical with an average daytime temperature around 80 degrees (F), a relative humidity from 70 to 90 percent, and, depending on location, an annual rainfall of up to 200 inches or more. The high islands of Kosrae, Pohnpei, and those in Chuuk State receive an average of eight to twelve inches of rain per month during most of the year. Yap State has a bit less rain and more pronounced wet and dry seasons. The nation’s atolls have fresh-water lenses, which can be threatened by drought, pollution, and, in times of severe storms, saltwater intrusion and contamination. Atoll populations must practice more serious water conservation than their neighbors on the high islands. The El Nino Southern Oscillation (ENSO) of 1998 caused drought conditions on all of the FSM islands and atolls. Since that time until the present there have been repeated, but less severe, El Nino-related weather conditions in all of the states. Lack of rain for several months causes all but the largest flowing streams on the high islands and most water sources on the atolls to dry up. Low lying areas on the high islands, and all of the nation’s atolls, are susceptible to flooding during typhoons, tropical storms, and unusually high tides.

The FSM’s 2010 population and housing census indicates that 102,843 people inhabit 67 of the islands in the country. The census revealed that the nation’s population has decreased by 0.4% over the past decade. 46.7 percent of the total population is 24 years or younger, approximately 5.4 percent over 65, and the population is almost evenly split between male and female (50.8% males per 49.2% females). The average household size is 6.1 persons. The average population density for the nation is approximately 379 persons per square mile, with some islands very sparsely populated, and the “urban” state centers ranging to over 1,100 people per square mile. In some areas the population lives in relatively concentrated village settings with other areas (or islets) set aside for agricultural purposes. The number of inhabited islands occasionally changes as families on the small outer atolls may move from one islet to another. Per WHO statistics, the national average life expectancy is 68.1 years for males and 70.6 for females and has improved dramatically since the end of WWII. In 2010, the crude birth rate (births/ 1000 population during the preceding year) was about 25.3. In the last three decades the actual population growth rate has significantly slowed due to emigration to Guam, Hawaii, and the mainland US, not a decrease in births.

During the last 30-40 years, a population shift towards the state centers has occurred. This migration is driven by the desire for access to services and a more “modern” lifestyle. For some families, with this move comes a daily struggle to obtain the basic necessities that were readily available back in the rural areas. A decrease in the quality of life, increased stress levels within the family, and a weakening of the extended family support system are the unfortunate results of this demographic trend.

The FSM is also a population in social transition. In less than two generations, people who were solely involved with subsistence level activities must now interact with a social and economic system that is overwhelming, confusing, and uninterpretable in many aspects. The extended family arrangement has eroded as young adult family members, who have entered the cash economy and become “bread winners,” supplant the elders who traditionally held the positions of authority. Associated with the disintegration of the extended family is the breakdown of the effective kindred support system that it provided. A high suicide rate is a result of this situation.

With regards to health status, the FSM’s populations often suffer from the worst of two worlds. Throughout the country, many of the traditional tropical and developing world infectious diseases and under-nutrition problems continue to burden the population (particularly children). At the same time, many of the lifestyle diseases associated with more developed nations, problems of over-nutrition, inactivity, injury, and substance abuse, are placing a heavy toll on the health of many citizens. Each state’s health services infrastructure has a hospital, a public/primary health care division which includes various prevention and health promotion programs, and a dispensary network. Due to the wide dispersion of islands and villages, some very geographically isolated with very small populations, the logistics of providing comprehensive and quality health care services to all of the FSM’s residents are challenging. Shortages of staff and medical supplies are common.

The leading causes of death among infants and young children are respiratory infections, prematurity, and under-nutrition. With the addition of diarrheal diseases, these health problems are also the leading causes of child morbidity as measured by outpatient visits and hospitalizations. Among older children, teenagers and young adults, injuries become the predominant cause of death, as they are in most parts of the world. Among unintentional injuries, numbers of water-associated deaths are about equal to motor vehicle-related deaths. Among intentional (violent) injuries, the high suicide rate is particularly notable, and is thought to be due to the burden of cultural and economic dislocation, particularly for young adult males. Suicide rates for young adult males in Micronesia are among the highest in the world. Alcohol is often a contributing factor in violent incidents.

In the FSM cancer has now been recognized as a significant disease burden on the citizens, the health providers, and the governments. Cancer is the leading cause of death in Yap, the third leading cause in Pohnpei, and Chuuk, and fifth in Kosrae. For women in the country, cervical, breast, uterine, and lung cancers cause over 50% of the mortality due to cancer. For men, lung, liver, and prostate cancers account for nearly half of the cancer deaths.

Among adults, heart disease and stroke have become the leading causes of death. The very high rates for adults aged 25 to 55, is two to four times the U.S. rate for similar age groups. This high rate of premature cardiovascular mortality suggests that the combination of lifestyle (high fat/sodium/calorie diet, lack of exercise, and tobacco and alcohol use) and genetics have created an unusual burden on the FSM population that otherwise would only show patterns of disease similar to other developing countries in the world. Diabetes is a major underlying contributor to morbidity and mortality. Indeed, the fact that these high rates of non-communicable diseases exist in the FSM in the face of the continued high incidence of tuberculosis, Hansen’s disease, rheumatic fever, rheumatic heart disease, etc., indicates that the FSM, in a situation similar to other Pacific island countries, has not completed an epidemiological transition, but rather, is in the unenviable position of being doubly afflicted by disease patterns of both a developing and a developed country.

Each state center island has a partially paved road system, with each state at different stages of paving additional miles. Pohnpei’s roughly 55-mile circumferential road was completely paved in 2005. The 2010 census reported that nationally, 36.9 percent of households owned at least one vehicle (car r truck) and about one quarter of those households owned more than one. This computes to about 10,000 vehicles in the country if government owned cars and trucks are included. About half of all the FSM’s vehicles are located on Pohnpei, while Kosrae has about ten percent. The balance is about evenly split between Chuuk and Yap.

### 2.1.2 Political profile

The capital of the FSM is located at Palikir on the western side of Pohnpei island. The national government is composed of three branches, with a unicameral legislature from which the president and vice-president are selected. The state governments have a similar set up, except for Chuuk which has a bicameral legislature. At the state level, governors and lieutenant governors are popularly elected. Each state is further divided into municipalities, most with the three branch government systems. In rare cases a very small municipal or village population (several hundred persons) is governed by these three levels, resulting in the unusual situation where government employees outnumber the citizens that they serve. In general, national government offices are responsible for: 1) interfacing with external entities such as foreign countries and international agencies, 2) professional licensure and standards in the education and health sectors, 3) immigration matters, and 4) the coordination of national plans and policies. State governments deal with the actual implementation and provision of public services, such as schools, health facilities, utilities, and public safety.

Coordinating environmental protection efforts is the FSM Department of Environment, Climate Change and Emergency Management. DECEM serves as a liaison with external organizations and programs dealing with environmental quality issues and provides programmatic assistance to the states. In its executive branch, each state maintains an Environmental Protection Agency, or an office which may carry a different name (KIRMA in Kosrae), but which provides similar functions.

The states are comprised of a main “state center” island and outer islands, except for Kosrae, State, which is composed of only a single island. The state government offices are all situated on the largest island in the state, which is also the center of commerce, post-primary education, transportation (airport and dock facilities), and the location of the state hospital. No area in the FSM can be considered truly “urban” in the sense of a big city environment, but the state centers often have a town setting with streets laid out in blocks. No building in the country is more than five stories tall. Health Service dispensaries and primary schools are located in most of the municipalities and on the more heavily populated outer islands.

### 2.1.3 Economic profile and economic sectors in the context of the POPs issue

The FSM’s economy is based largely on funding received from the US Government under the terms of the Compact of Free Association. Fishing fees and a limited number of food and materials (handicrafts and copra) augment the “Compact” funding. Many FSM citizens living abroad send funds to the family “back home” in the islands. The 2010 census estimated that approximately $7.7 million annually arrives via this informal system. The selling of fishing rights to foreign countries, and income from the tourism and handicraft industries are making an increasing contribution to the economy. However, these industries can be subjected to significant variations, which are beyond local control.

The FSM’s 2018 Statistical Report indicates an estimated national gross domestic product (GDP) of US$251 million for the FSM, with imports of $183.4 million, and exports of $46 million. The report also lists the per capita GDP (2018) as $2,408. Household median income was $8,485 in 2018, and about 90 percent of all the FSM’s households had a member with a cash income. Considerable variability exists between individual islands and communities, as large portions of outer island populations are involved only with subsistence livelihoods. The government is a major employer, while agriculture and fisheries, tourism, handicrafts, construction, retail/wholesale, and services provide the bulk of the private sector employment.

Industry in the FSM is limited to those operations which can be financially viable in spite of the nation’s geographical isolation and distance from suppliers of raw materials. Most production processes in the country are home-based “cottage industry” operations creating carved or woven handicraft items or packaged agricultural items. Larger industrial activities in each state are related to either the maritime/fisheries sector, construction, or power generation. The copra industry is of significantly less importance than in past years. It now constitutes a minor portion of the country’s exports. Coconut oil products (soap, shampoo, body and cooking oils, and biofuel) for local sale and export are manufactured and small scale furniture production shops operate supply local demand. In Yap, a small operation processes coral into lime for commercial sale to betel nut chewers. Each state has various sizes of construction companies making roads and/or erecting buildings. Asphalt plants provide paving material in Kosrae and Pohnpei. A number of cement batch plants and concrete block productions facilities exist in the nation, with most states having two or more.

Other small industries include printing shops, and sign/banner shops which also print shirts. Several private medical clinics are now operating in Pohnpei and Chuuk.

All four FSM states have one power generating facility in the state center, while both Chuuk and Yap also have plants on their outer islands with the larger populations. The hospitals, telecommunications offices, government offices, banks, and numerous larger commercial enterprises have various sizes of generators for use or to provide back-up power. These run from thousands of small portable units, to larger stationary units providing island-wide power.

Each FSM state is involved to varying degrees in the fishing industry. Fish is caught by both foreign fishing vessels licensed to fish in the FSM’s vast ocean area and by local fishermen. No canning operations exist in the country; however, some fish processing is done in-country (mostly cutting loins, etc). Most of the commercial catch is exported to Japan.

In 2017, the FSM’s transportation related industry included three regional airline headquartered outside of the country and two local air services. Each state has one airport in the state center capable of accommodating “737-size” jets, and smaller landing strips on a few of the larger outer islands/atolls. With regard to land transportation businesses, private fleets and some individuals’ cars and trucks provide taxi services in the state centers. In Chuuk, small boats provide ferry services within the main lagoon, primarily to and from Weno.

Petroleum products storage and distribution facilities are located in each of the state centers, while numerous gas stations (with electric pumps) are also located on the main islands. Fuel dispensing in the more distant locales is often by hand pump or siphon. One major supplier of petroleum products operates in the FSM, and Pohnpei has a distributor of LP gas.

Numerous vehicle and small engine repair shops operate in each state as well as general home repair and air conditioning services. Each state has at least one printing service in the private sector, plus some printing is done by the state Departments of Education. No operation employs more than 15 people.

At the present time, no mining operations exist in the nation. Extraction activities, limited to quarrying for rock and other fill materials (primarily dirt), are done in each state. Some of the quarrying operations are private, while some are run by the state governments. Dredging for coral as a road base and fill is also done in each state. During the Japanese period, phosphate was mined on the outer island of Fais, in Yap state.

The vast majority of the FSM’s population that is involved in agriculture does so mainly for subsistence demands, only selling if financially necessary. When there is a need for cash, farmers will harvest whichever of their crops is in season at the time, or go fishing, and sell at the local markets. Citrus grown on Kosrae, bananas and sakau grown on Pohnpei, and betel nut from Yap are the major agricultural exports. A small number of local markets buy from the farmers, pack, and then ship to off-island buyers, mostly in Guam. There are no commercial farms in operation that employ more than 15 people. Methods employed by most farmers do not always involve the clearing of tracts of land, and thus measurement of farm size is not possible. Breadfruit, bananas, taro, yams, tapioca, potatoes, and coconuts are among the crops grown and consumed as dietary staples.

Specialized support for increasing and expanding local agriculture production (and the anticipated subsequent reduction of the consumption of imported foodstuffs) is provided by each state’s Agricultural Division, with technical assistance provided by several international projects and local non-governmental organizations. The expected results of these programs are decreased imports, and improved nutrition leading to better general health of the population.

Subsistence fishing follows the same pattern as agriculture. Fishermen usually use their catch to feed the family, but when cash is needed, the fish are sold at the market. Due to an increased desire for imported foodstuffs and other items, often more fish have been sold instead of consumed by the family. Other marine environment exports include black pearls, coral and tropical fish for aquariums, and natural sponges.

No local industries produce or formulate chemicals in the FSM, with the exception of the LP gas business which produces oxygen. They also import and store nitrogen, argon, helium, carbon dioxide, and acetylene for distribution to local users. Information on the safe handling and use of these substances is available from the businesses, and they oversee the condition of the various canisters and other containers used. The nation’s importers and retailers are responsible for the import of general use chemicals, such as solvents, paint additives, etc., and most can provide MSDS’s as required. Overall, the relevant activities of the FSM’s industrial sector are generally not geared towards chemical management beyond what is necessary to safely conduct its various operations.

The petroleum industry is the primary importer of petroleum products which are distributed and then sold on a wholesale and retail basis. The industry also handles the bulk storage of petroleum products at facilities in each of the four states. These businesses are international in scope and have existing procedures established for all aspects of the management of their chemical products. Training on safety and emergency procedures for the employees of these companies is provided on a regular basis.

The transportation sector is one of the major users and handlers of petroleum products. Each state’s airport and seaport have storage and dispensing facilities for use by airplanes and ships. The airlines which serve the FSM are international or regional carriers and also have established international guidelines which are followed. Employees of these businesses also receive safety and emergency procedures training. The local shipping services are operated by the national and state governments and have been providing services to the outer islands of the country for several decades. The expertise to safely manage the chemicals typically used on board the ships exists within the staff responsible for the day-to-day operations.

Numerous vehicle and small engine repair shops operate in each state as well as general home repair and air conditioning services. Each state has at least one printing service in the private sector, plus some printing is done by the state Departments of Education. None of these operation employs more than 15 people.

At the present time, no mining operations exist in the nation. Extraction activities, limited to quarrying for rock and other fill materials (primarily dirt), are done in each state. Some of the quarrying operations are private, while some are run by the state governments. Dredging for coral as a road base and fill is also done in each state. During the Japanese period, phosphate was mined on the outer island of Fais, in Yap state.

Today, the majority of the FSM’s population that is involved in agriculture, does so mainly for subsistence demands, with the exception of black pepper export and the locally sold cash crops of sakau (kava) on Pohnpei, and betel nut in each state. When there is a need for cash, farmers will harvest whichever of their crops is in season at the time and sell them at the local markets. Citrus grown on Kosrae, bananas and sakau grown on Pohnpei, and betel nut from Yap are the major agricultural exports. A small number of local markets buy from the farmers, pack, and then ship to off-island buyers, mostly in Guam. There are no commercial farms in operation that employ more than 15 people. Methods employed by most farmers do not always involve the clearing of tracts of land, and thus measurement of farm size is not possible. Breadfruit, bananas, taro, yams, tapioca, potatoes, and coconuts are among the crops grown and consumed as dietary staples.

Specialized support for increasing and expanding local agriculture production (and the anticipated subsequent reduction of the consumption of imported foodstuffs) is provided by each state’s Agricultural Division, with technical assistance provided by several international projects and local non-governmental organizations. The expected results of these programs are improved nutrition and improved general health of the population.

Subsistence fishing follows the same pattern as agriculture. Fishermen usually use their catch to feed the family, but when cash is needed, the fish are sold at the market. Due to an increased desire for imported foodstuffs and other items, often more fish have been sold instead of consumed by the family. Other marine environment exports include black pearls, coral and tropical fish for aquariums, and natural sponges.

Industrial entities are few in number within the FSM and are limited to light industry, small shops (auto repair, cement block, printing, fiberglass, coconut processing), construction, and power generation. The fish processing industry is also active in the country, but primarily is focused on trans-shipment of fish to destinations in Asia. No canning of the product is performed. The dry-docking facility in Kosrae is involved primarily with vessel repair work.

No local industries produce or formulate chemicals in the FSM, with the exception of the LP gas businesses which produce oxygen. They also import and store nitrogen, argon, helium, carbon dioxide, and acetylene for distribution to local users. Information on the safe handling and use of these substances is available from the businesses, and they oversee the condition of the various canisters and other containers used. The nation’s importers and retailers are responsible for the import of general use chemicals, such as solvents, paint additives, fire retardants, etc., and most can provide MSDS’s as required. Overall, the relevant activities of the FSM’s industrial sector are generally not geared towards chemical management beyond what is necessary to safely conduct its various operations.

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### 2.1.4 Environmental overview

The FSM consists of a mix of a few high islands and many low-lying flat coral atolls. The low elevations above mean sea level (15 – 20 feet maximum) make the atolls very susceptible to climate change and sea level rise. Some of these islands are elongated and so narrow that it is possible to see both the ocean and lagoon sides of the island from the middle of the island. The atolls are fairly uniform in composition, mainly sand of coral origin, resting on a reef platform. Fresh water is obtained by capturing rainwater or tapping the fresh groundwater lens. Once an atoll’s fresh water lens is contaminated by sea water, as a result of a typhoon or by an unusually high tide, much time and effort is required to rehabilitate this water source.

The FSM’s high islands are also vulnerable environments. Landslides occur on steep slopes, and some streams often flood in heavy rainfalls. Loss of natural vegetation in the watershed areas of some high islands is of concern, as is the resultant erosion and silt deposition in the mangrove swamp and on the reefs. Threats to the country’s environment include climate change, population pressure, overfishing, destruction of reefs, sand and gravel dredging/mining, clearance of natural vegetation, freshwater pollution, improperly handled solid waste, hazardous waste, and invasive species.

In 2020, rising sea levels, ocean acidification, and soil erosion are the top priority environmental concerns in the nation. The flooding of seaside properties, the destruction of coral reefs, and sediment deposits that smother mangrove based marine life, all have a detrimental effect on people’s health.

#### 2.1.4.1 National Infrastructure related to chemical management

**Transportation**

Travel between the islands in the FSM is by either ship or plane. For intrastate travel, each state government provides passenger and freight transportation by means of a “field trip” ship. In general, each outer island receives a visit less than once per month. These ships are sometimes also utilized for interstate travel.

In Pohnpei, Chuuk, and Yap states small planes provide regular services to the few outer atolls which have landing strips. International air transportation until 2019 was provided by three international airlines, one of which lands on each island on an average of once per day, alternating directions to destinations to the east and west. The other international airlines serviced Pohnpei and Chuuk states once a week from Port Moresby, PNG and the Republic of Nauru. As of the date of this writing, restrictions on international air travel have been made due to the COVID-19 pandemic.

Transport of imported goods is primarily by container ship. Several shipping lines serve the four states under varied schedules, with a rough average arrival at Pohnpei and Chuuk of one ship every two weeks. Average arrivals for Kosrae and Yap are slightly less frequent. Imported goods arriving via air freight comprise less than 1 percent of the total volume of imports.

Each state center island has a partially paved road system, with each state at different stages of paving roads distant from the main town. Nationally, the 2000 and 2010 censuses indicated that just over one-third of households owned at least one vehicle. In 2015 the national total of registered vehicles was estimated at 9,000 units, and it is reasonable to expect that another 1,000 vehicles have arrived in the past five years. About half of all the FSM’s vehicles are located on Pohnpei. Each state has a number of repair facilities including government facilities for school busses, ambulances, police cars, fire trucks, etc., and smaller private shops which might handle one to five cars simultaneously. There are fewer than 50 repair shops national-wide.

Disposal of old, broken vehicles is a related issue. Hundreds of such junk items are scattered along the roads and driveways of the nation. These items are dangerous, from both a physical trauma (lacerations, puncture wounds), but the possibility of exposure to toxic substances is also a very real risk. The discarding of junk vehicles is not regulated by any of the states.

The importation and nation-wide distribution of fuel to operate the generators which provide electrical power for every electrical device on island is handled by a semiprivate corporation. They also provide kerosene, aviation fuels and lubricants.

**Energy Generation/Consumption**

Access to electricity has expanded over the last 40 years. In 1980 28% of houses had power. In 2010 about 55% of houses were connected to the power grid. State centers (urban areas) have almost full coverage, while the more rural areas have about 45% coverage. Only about 4% of power is generated by non-diesel fuel (solar). In 2015 the total amount of electricity produced in the FSM was 20.1 MW.

Island power - All four FSM states have one power generating facility in the state center, while both Chuuk and Yap also have plants on the outer islands with the larger populations. In 2018, 67% of households had access to electricity. The hospitals, telecommunications offices, government offices, banks, numerous commercial enterprises, and many private citizens have various sizes of generators for use, or to provide back-up power. These run from hundreds of small portable units, to an estimated total 400 midrange size (50–200 KVA) units, to a reported 23 larger stationary 400-600 KVA units in the country. In 2015 the total produced in the FSM was 20.1 megawatt (MW), 96% of which was made from diesel fuel. The remaining 4% sources from hydro and solar systems.

Solar – Solar panels are becoming a more common site in the FSM over the past decade, both in the state centers and outer islands. In Yap Sate 22% of energy is produced by non fossil fuel methods. The largest arrays are located on schools and government buildings, but a growing number of private homes are also being topped with solar panels.

Other Cooking Energy – The kinds of energy used for cooking purposes includes electric stoves, microwaves, and other electric kitchen appliances. Kerosene is also a popular heating agent for those outside of the power grid. Wood is the traditional source of cooking energy and bundles of firewood are sold in the markets. The industry is sustainable at the present, but the danger of mismanagement is ever-present. Butane canister stoves have become popular for their convenience, non-reliance on plugging into electrical, or lugging around bulky containers of kerosene. Bio-mass cooking is rarely practiced. A biogas system utilizing pig manure is gaining in popularity as many pilot systems are now operating around the island of Pohnpei.

By dollar value, fuel is the second largest commodity imported into the FSM after food. Other import categories that may impact the volume of in-country POPs include transportation of equipment and parts, non-household machinery, and construction materials.

**Solid Waste Management**

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Increased levels of imported goods will obviously result in more solid waste for the nation’s dumpsites and landfills. The disposal of solid waste is a particularly challenging activity for residents of small islands and atolls. In these geographical situations economic development must be planned with an effective waste management component.

Municipal – State centers and every other inhabited island in the FSM struggle to properly address the constantly growing problem of the disposal of municipal solid waste. The situation, state to state, varies in amount of waste processed, but the processes involved are generally limited to disposal in a dump/landfill site, and in some cases (about 4%), incineration. Collected data suggests that the per capita generation rate for municipal solid waste is approximately one half of this rate in the US. This is clearly not a sustainable situation and thus reduction of the waste stream is an urgent challenge to be addressed in the FSM.

To properly operate a dump/land fill is an expensive undertaking for small island governments, but not to address this critically important aspect of the health of the community could cause a public health crisis or result in an environmental disaster. No state at the present time has an operational incinerating system that can properly handle all of the hazardous wastes, so the best available technology is employed. On Pohnpei, the burning of the item is in a dedicated container, located at the dump, using a mixture of diesel and waste oil to assist the combustion. Waste oil is stockpiled in drums awaiting removal by ship. Data collection concerning incoming waste is now being done in the states. Besides oil and the biological material from the hospital, it is not known what waste chemicals might be hazardous. Certain items are segregated at the dumpsite including e-wastes, used oil, tires, and discarded vehicles. Waste management activities in the three other FSM states are similar to Pohnpei’s effort, but less comprehensive.

Outer island municipal waste management usually consists of a designated convenient locale being utilized. Recyclable and reusable items with enough value may be brought back to the main island, but this effort does not translate into much removed waste. All of the FSM’s approximately 60 inhabited outer islands have a solid waste problem. The larger the population, the larger the problem.

**Water supply**

Each of the high islands in the FSM has one or more local water distribution systems which utilize water from either underground water accessed by wells, or by reservoirs created by constructing dams on some of the larger streams. The systems may include filtration and storage tanks and distribution lines and may be large enough to serve an “urban/town” population of several thousand, or a village population of several hundred. These smaller water systems are not always tested for contamination. At time states may experience shortages of purifying agents (chlorine, other chemicals, and laboratory reagents). When this occurs, public announcements advising that household drinking/cooking water should be boiled are broadcast on the radio.

An additional source of water is from shallow “wells” dug short distances, approximately two meters, from the bank of a stream. Relatively clean water seep from the stream to these wells. Depending on conditions upstream from the well location, the water may not be safe. Thus, frequent testing is advised.

Residents of atolls must rely on rain catchment systems or on the underground freshwater lens found in atoll environments. Lens water maybe brackish and not taste very good, but useable for washing. Drinking and cooking with lens-water is possible, but some form of decontamination process (boiling) may be needed. Both rain and lens systems can be damaged in storms or run dry in drought conditions. Sea water inundation can also ruin the “lens” reservoir.

Water testing is a state responsibility which is conducted by the EPA/KIRMA offices. Expanded, improved, surveillance systems are a need in some locations. Surveillance of the clinical manifestations of water-borne diseases and comparison with water testing results can provide clues to disease incidence and distribution. Water testing results information is maintained at the state level.

**Sewage Treatment**

Only state centers have a sewage system with household hook up. All other sewage on the high islands is handled at the household or community level. Outer islands with small populations have a community designated location for defecation. The larger outer islands may have community facilities.

Sewage treatment facilities vary from state to state and are found only in the state centers. The state EPAs report that the chemicals utilized in the sewage treatment process are not found on any POPs list.

**Communications**

Local and international connectivity in the FSM is the responsibility of a semi-private corporation, the FSM Telecommunications. At present, the services in most locations in the FSM are comparable to any other location worldwide, the only differences being speed and cost. With regard to the disposal of “hand-held”, portable, and tabletop electronics, e-wastes are a problem due to the harmful emissions released during burning. E-wastes need to be segregated from other municipal waste and receive special disposal handling when available.

## 2.2 Institutional, policy, and regulatory framework

### 2.2.1 Policy and regulatory framework

The legal instruments in the FSM that pertain specifically to chemical management almost entirely target the toxic substances that are found in pesticides and insecticides. The 2018 FSM’s State of Environment (SOE) report states that, “While the FSM has many laws, policies, and regulations that promote sustainable use and protection of its environment, there are still many gaps.” Informational gaps relate to the kinds and amounts of chemicals that are identified in-country. Resource gaps include not enough trained staff, insufficient materials and equipment, and inadequate funding support. Organizational gaps deal with jurisdictional issues and regulatory activities. Research from the original POPs in PICS project, 15 years ago, revealed that the scope of the FSM’s legal framework for chemical management was reasonably comprehensive with regard to the various chemical items listed for import ban or restriction, but that gaps exist in procedures, communications, skilled human resources, budgetary/financial matters, and jurisdictional cooperation between the national and the four state governments.

The FSM Constitution does not specifically use the word “environment”, causing the interpretation of the constitutional text to mean that this is a state-level issue. While the implementation of the monitoring and enforcement of chemical-related laws and regulation is primarily an activity conducted at the state level, it is necessary that some degree of coordination and standardization be established by the national government. It would be nonsense to allow one state to import a POPs chemical, while a sister state is denied.

Prior to 2008, there was no national entity specifically charged with environmental management. The Office of Environment and Emergency Management (OEEM) existed within the Department of Health Services. At the present time, FSM-Department of Environment, Climate Change and Emergency Managementis the entity holding responsibility for Chemical Management at the national level. Within DECEM, the coordinating role for chemical management-related activities rests with the Division of Environment and Sustainable Development.

The approaches and procedures to chemical management are efforts primarily conducted at the state level. Each of the four FSM states has an office responsible for EPA-related activities, (3 EPA’s and KIRMA in Kosrae). The actual implementation activities, regardless of the sector, usually occur at the state level. Concerning the control of chemicals, limited information exists since, to date, this matter has not been one of the high priority topics of discussion in the nation. Pesticide registration is the only major chemical management work being done by the states at this time. Registration forms that collect information concerning the import and use of pesticides have been developed by each state. Since state level staff are responsible for efforts protecting the local environment and possess the most extensive and accurate knowledge of the situation in their particular state, it is reasonable for most of the monitoring and enforcement activities to be handled by the state governments. The EPA Administrator holds the power to suspend and revoke licenses, have access to records, inspect shipments, restrict and ban use, seize materials, and issue “stop sale, stop use, or removal” orders. However, without sufficient resources and support from the national level devoted to the state monitoring and enforcement activities, the effort will be weak.

The information in table below provides an overview of what legal mechanisms exist to control various aspects of importation, sale, storage, application, handling, use, distribution, disposal, and removal of chemicals used in pesticides and insecticides. The regulations also identify certain investment activities which are prohibited anywhere in the territory of the country due to the chemical associated risks involved. The examples provided here are from the national government and from Yap State. Each state has very similar regulations.

* The regulations under numbers 1, 2, and 3 refer to Insecticide Control, Water Pollution Control, and Pesticide Control, respectively.
* Item number 4 is a more recently developed piece of national legislation, being created to facilitate the implementation of the FSM’s Foreign Investment Act of 1997
* Numbers 5, 6, and 7 of Table 4A reflect the types of legislation that exist at the state level.

**Table 3. References to Existing Legal Instruments which Address the Management of Chemicals**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Legal Instrument (Type,**  **Reference,**  **Year)** | **Responsible**  **Ministries or**  **Bodies** | **Chemical Use Categories Covered** | **Objective of Legislation** | **Relevant Article / Provisions** | **Resource**  **Allocated** | **Enforcement Rank 1=effective 3=weak** | |
| 1 Regulation – FSM Code (from TT Code – 1974) | Health Services | Insecticide Control | Control of Banned & Restricted Insecticides | Title 41  Parts 165 to169 | None specifically listed | | 3 |
| 2 Regulations – FSM Code (from TT EPA Board Regulations 1975) | FSM-DECEM | "Chemical Wastes" | Water Pollution Control | Title 25 | None specifically listed | | 3 |
| 3 Regulations – FSM Code (from TT EPA Board Regulations)  Effective Date: 1 Aug 1980 | State EPA’s | Pesticides | Pesticide Control: Importation, Distribution, Sale, and Use | Title 63  Chapter 13  Subchapter IV | None specifically listed | | 3 |
| 4 Regulations for Foreign Investment Act of 1997 - FSM Public Law No. 10-49 | Secretary of the FSM Department of Economic Affairs | Biological & Chemical Warfare Components | Economic Sectors in which Foreign Investment is Prohibited or Restricted | Title 32 | None specifically listed | | 2 |
| 5 State Level Regulations Example: Yap State Environmental Quality Protection Act (YSL 3-73), 29 Nov 94 | State EPA’s | Transportation Sector and Consumer Use  Land & Water Emissions | Oil Spill Reporting | Example: Title 18 Yap State Code Section 1507(a) | None specifically listed | | 2 |
| 6 State Level Regulations Example: Yap Environmental Quality Protection Act (YSL 3-73) 15 Feb 95 | State EPA’s | Pollution to Air and Water | Environmental Impact Statements (EIS) | Example: Title 18 Yap State Code Section 1509(a) | None specifically listed | | 1 |
| 7 State Level Regulations Example: Yap State Pesticides Regulations,  10 Oct 01 | State EPA’s | Pesticides | Control of Pesticides - Importation, through to Disposal | Example: Yap EPA Regulation No. 2001-1 | None specifically listed | | 2 |

The following information is sourced from Part 2 of the Kosrae State Code and provides explanations about air quality and the control of hazardous substances and pollution.

**September 2014 update of the KOSRAE STATE CODE – PART 2**

**TITLE 12 - Chapter 12 – Section 12.1205: Indoor Clean Air Act**

Section 12.1601. Title. This Act shall be known as the Indoor Clean Air Act of 2010.

Section 12.1602. Definitions. For purpose of this Act, the following terms shall have the meaning stated below:

(1) “Smoking” means the activity of inhaling and exhaling smoke from tobacco and other substances that are lit in cigars, cigarettes, and pipes, and to possess or transport cigars, cigarettes, pipes and smoking articles while lit.

(2) “Public place” means that portion of any building or vehicle used by and open to the public, regardless of whether the building or vehicle is owned in whole or in part by private persons or entities, the Kosrae State Government, or other public entity, and regardless of whether a fee is charged for admission or use.

**TITLE 19 - Chapter 12**

**Chapter 5 – Hazardous Substances and Pollution**

**Subchapter A – General Provisions**

**Subchapter B – Pollution**

Section 19.502. Littering.

Section 19.503. Fouling of public rivers and public water supply.

Section 19.504. Polluting.

Section 19.505. Contamination of fishery waters.

**Subchapter C – Persistent Organic Pollutants**

Section 19.506. Title: Persistent Organic Pollutants Acts of 2009.

Section 19.507. Purpose. Protect the environment and the health of persons of Kosrae

Section 19.508. Definitions.

Section 19.509. Hazardous Substances Covered by this Act.

(1) Aldrin (7) Furans

(2) Chlordane (8) Heptachlor

(3) DDT (Dischloro –diphenyl trichloroethane) (9) Hexaclorobenzene (HCB)

(4) Dieldrin (10) Mirex

(5) Dioxins (11) Polychlorinated Biphenyls (PCBs)

(6) Endrin (12) Toxaphene

Section 19.510. Additions to the Priority List.

Section 19.511. Sale, Use, Possession and Discharge of Substances on the Priority List.

Section 19.512. Labeling Requirements.

Section 19.513. Permits.

Section 19.514. Violation, Warning Notices and Penalties.

Section 19.515. Liability.

Section 19.516. Cooperation.

Section 19.517. Authority to Inspect.

Section 19.518. Exemptions.

Section 19.519. Community Education.

Section 19.520. Implementation of the Stockholm Convention.

**Chapter 6 – Waste Management and Recycling**

**Subchapter A – Kosrae Recycling Program**

Section 19.601. Recycling Program Established.

Section 19.602. Recycling Agent.

Section 19.603. Regulation.

Section 19.604. Recycling Deposit Fee.

Section 19.605. Recycling Fund.

Section 19.606. Payments by Recycling Agent.

Section 19.607. Reimbursements to Recycling Agent or Recycling Operator.

Section 19.608. Reporting.

Section 19.609. Recycling Offenses.

At this time, other than the above-mentioned laws and regulations, no further control measures on chemicals are in place in the FSM. Control efforts are often out-of-date, sometimes obsolete, and for the most part, relevant data bases in each state are limited to the pesticide registries in the EPA offices. The Tax and Revenue Office of the FSM Department of Finance also has a data base of import information collected from the submission of the Self Assessed Declaration (SAD) forms by importers. Unfortunately, the data collected usually does not identify whether or not the product’s ingredients includes any POPs substances. There are some strategies that might be used to increase the sensitivity of the data collected from the SADs but improving the system to this level may not be a priority activity in the Tax and Revenue division. Improved coordination between offices would serve to increase the chances of illegal and/or dangerous chemicals being identified.

As is indicated in Table 4 below, a similar situation exists with regard to the FSM’s involvement in a number of regional and international agreements, conventions, and treaties. Some of the agreements to which the FSM is a party directly address chemical safety and management, while others have a focus more on the protection of natural resources and the environment. The country’s status with respect to the different agreements varies, some have been signed, some “entered into force,” some ratified, and for some accession status has been achieved.

**Table 4. FSM Participation in International Agreement/Protocols/Conventions related to Chemical Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **International Agreements** | **Primary Responsible Agency** | **Ratification Date** | **Relevant National**  **Implementation Activities** |
| Compact of Free Association between the FSM and US. | FSM Dept. of Foreign Affairs | 03 Nov 86 | Government Operational Relationship |
| Agenda 21 - Commission for Sustainable Development | DECEM | N/A | Sustainable Development Initiatives |
| Stockholm Convention on POPs | DECEM | February 2005 | Persistent Organic Pollutants Project - National Implementation Plan |
| Convention on Biological Diversity | DECEM | 20 June 94 | Biological Diversity Issues |
| Cartagena Protocol on Biosafety | DECEM | 1 Jan 03 | Safe handling, transport and use of living modified organisms (LMOs) |
| London Guidelines/United Nations Environment Program  (Set of voluntary procedures) | DECEM | 1989 | Process of increasing chemical safety in all countries through the exchange of information on chemicals in international trade. |
| Food and Agricultural Organization (UN) Code of Conduct  (voluntary procedure) | FSM Dept. of Economic Affairs | 2014 | Establish voluntary standards of conduct for all entities associated with the management of pesticides and other substances |
| Vienna Convention (1985) | FSM Dept. of Economic Affairs | 06 Sept 95 | Control Import & Use of Ozone-Depleting Substances |
| Montreal Protocol (1987) | FSM Dept. of Economic Affairs | 06 Sept 95 | Control Import & Use of Ozone-Depleting Substances |
| Waigani Convention (1995) | DECEM | 23 May 97 | Ban Imports & Control Transport of Hazardous and Radioactive Wastes |
| Basel Convention (1989) | DECEM | 06 Sept 95 | Control of Transboundary Movements of hazardous substances |
| Convention for Protection of the Natural Resources and Environment of the South Pacific Region (Noumea Convention) | DECEM | 29 Nov 88 | Natural resource and environmental protection issues |
| Chemical Weapons Conventions (1997) | Dept. of Foreign Affairs | 21 June 99 | Nuclear and Chemical Weapons Ban |
| Convention on Biological Diversity | Dept. of Economic Affairs | 20 June 94 | Biodiversity Issues |
| US Environmental Protection Act | DECEM / State EPA Offices | On-going - Compact support | Technical and Funding Assistance for Environmental Protection Activities |
| Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer | DECEM | 17 May 17 | Control Import & Use of Ozone-Depleting Substances |
| Paris Agreement under the United Nations Framework Convention on Climate Change (2016) | DECEM | 15 Sept. 16 | An agreement within the UNFCCC), dealing with greenhouse gas emissions |
| Pacific Regional Pesticide Registration Scheme (PRPRS), approved in Vanuatu 2017 | DECEM | 2017 | Pesticide registration systems |

### 2.2.2 Institutional framework

#### 2.2.2.1 Departments, Agencies, and Other Institutions that Manage Chemicals

As with many social issues, the management of chemicals in the FSM requires the involvement of a number of government departments at the national and state levels. This situation described in the table below has been in place for a number of years; only the name of the office has been changed. Not every office/department is involved with every stage of every POPs chemical. In some instances, such as with the state agricultural offices, the chemicals are managed by their staff for the simple reason that the chemicals are used in the programs which they operate. Problems related to overlapping responsibilities and responsibility gaps can emerge the same as with many government operations. Despite the coordinating mechanisms which may exist, human elements and attitudes can influence the performance of these mechanisms, causing less than favorable results.

**Table 5. Responsibilities of Government Ministries, Agencies and other Institutions**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Stage of Life-cycle→**  **Department Concerned ↓** | **Importing** | **Productionn** | **Storage** | **Transport** | **Distribution / Marketing** | **Use & Handling** | **Disposal** |
| Environment | X |  | X | X | X | X | X |
| Health Services | X |  | X | X | X | X |  |
| Agriculture | X |  | X | X | X | X | X |
| Trade / Commerce |  |  |  |  |  | X |  |
| Finance / Customs | X |  |  |  |  |  |  |
| Transport | X |  | X | X | X | X |  |
| Justice | X |  | X | X | X | X | X |
| Foreign Affairs | X |  |  |  | X |  | X |

Indicated in the table above are the various stages of the chemical’s lifecycle during which one or more government sectors might be actively involved during the management of a particular chemical throughout its lifecycle. As has been previously mentioned, there is room for improved coordination between the various state and national offices and other departments which are involved with chemical management and regulation. When any program is implemented by a number of agencies or departments, overlapping and duplication of activities are inevitable unless boundaries of responsibility are clearly defined. Responsibilities must be appropriately assigned, and this is possible through effective inter-departmental dialog.

Other local and regional non-government institutions that may have on-going, frequent, or occasional involvement with chemical management in the FSM include: the Chuuk Conservation Society, the Conservation Society of Pohnpei, Yap Community Action Agency, Kosrae Conservation and Safety Organization, Micronesia Conservation Trust, The Nature Conservancy.

#### 2.2.2.2 FSM Inter-departmental Commissions and Coordinating Mechanisms

As a result of the 2006 POPs in PICS project, specific groups were created to focus solely on the matter of POPs and chemical management. Each state established a POPs Task Force operating out of the EPA (or equivalent) office, and the national government established a National Steering Committee. At both levels, membership was broad-based and included representation from the appropriate departments. That no NGO representation was included is an oversight. It appears that most of these groups have not been active. Most likely the responsibilities have been folded into some other office’s work, and perhaps are considered low priority.

To provide long-term commitment, these task forces must evolve into a more effective instrument. There must be on-going surveillance related to chemical management, utilizing up-to-date techniques and information. The government must encourage and support the continued involvement and participation of a wide cross section of government department representatives, include the business sector, and also NGOs. In some FSM states, traditional and possibly religious leadership should also play an important role in the functioning of the Task Force, as the leaders are important stakeholders. These individuals have a traditional responsibility to protect their land and people and have the power to influence people to adopt sensible attitudes and new behaviors.

In addition to the POPs-related groups, there are a number of other national and state mechanisms that attempt to facilitate effective communication among the various chemical management stakeholders. These include national/state government offices and Civil Society Organizations (NGOs) that are active in environment and health issues. The following table lists some of these organizations.

**Table 6. Overview of Inter-departmental Commissions and Coordinating Mechanisms**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name of Mechanism** | **Responsibilities** | **Secretariat** | **Members** | **Legislative Mandate / Objective** | **Effectiveness 1 = excellent**  **3 = poor** |
| National Sustainable Development Council | Coordinate government activities | Department of Economic Affairs | All executive department heads | Presidential Order | 3 |
| POPs National Steering Committee | Coordinate government POPs-related activities | Department of DECEM | Mixed | Presidential Memorandum | 3 |
| POPs Task Forces in each FSM State | Plan and implement POPs NIP activities | State EPA (or equivalent) | Varies | Executive Order from Governor | 3 |
| KSA Consumer Protection & Safety Interagency Collaboration | Promote awareness of consumer protection and safety issues | State Dept. of Commerce & Industry | Mixed | Executive Order from Governor | 3 |
| Pohnpei Resource Management Committee | Provides conservation guidance to state resource agencies | State Forestry Office & CSP | Mixed. Chaired by Lt. Governor | None | 3 |
| Yap - Environment Stewardship Consortium | Links government agencies, NGOs, and communities in areas of environment conservation and natural resource management | Yap Community Action Program (Yap CAP) | MIXED environment & natural resource related agencies and community representatives | Mandate from the Council of Pilung (Council of Traditional Leaders of Yap) | 3 |

International bi-lateral support has been received from other sources. One of the most notable projects is the technical support received from the Government of Japan. Support has included technicians and administrative support to conduct a “waste volume and content” survey in recent years.

Table 7. Solid Waste Management Strategy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Pohnpei** | **Kosrae** | **Chuuk** | **Yap** |
| **Waste Generation Rate** | 2.54 lbs/person/day | 2.48 lbs/person/day | 2.02 lbs/person/day | 2.85 lbs/person/day |
| **Composition by Volume** |  |  |  |  |
| Kitchen waste | 8.50% | 10.30% | 8.50% | 46.30% |
| Grass/Wood | 7.20% |  | 7.20% |
| Cardboard | 15.60% |  | 15.60% | 13.00% |
| Paper | 4.60% | 17.60% | 4.60% | 3.40% |
| PET Bottle | 3.90% | 34.20% | 3.90% | 2.70% |
| Other plastic | 39.70% | 39.70% | 18.60% |
| Aluminum Can | 3.30% | 5.50% | 3.30% | 1.10% |
| Canned Food Tin | 2.80% | 9.30% | 2.80% | 3.90% |
| Other Metal | 3.30% |  | 3.30% | 3.00% |
| Glass | 2.40% | 2.10% | 2.40% | 0.40% |
| Textile | 1.30% | 0.20% | 1.30% | 2.50% |
| Ceramic/Stone | 0.20% |  | 0.20% |  |
| Diaper | 3.50% |  | 3.50% |  |
| Rubber/Leather | 0.90% | 20.90% | 0.90% |  |
| Others | 3.00% | 3.00% | 5.00% |
| **Total** | **100.20%** | **100.10%** | **100.20%** | **99.90%** |

https://www.sprep.org/j-prism-2/report-and-materials

### 2.2.3 Stakeholders’ roles

As with many social issues, the management of chemicals in the FSM requires the involvement of a number of government departments at the national and state levels. In some instances, such as with the state agricultural offices, the chemicals are managed by their staff for the simple reason that the chemicals are used in the programs which they operate. . Vendors also should be represented in the stakeholders group as they are often involved with chemical import, storage and use, and explaining the important aspects of handling potentially dangerous chemical properly

The major chemical management work being done by the states at this time focuses on pesticide control. “Notification of Import” forms that collect information concerning the import and use of pesticides have been developed by each state. . It has been noted, however, that due to the routine and repetitive nature of the imports, this has led to these import forms not being given the full attention that they deserve.

At the FSM National level, the management of POPs substances falls under the responsibilities of the Department of Environment, Climate Change and Emergency Management, while at the state level the entities responsible for environmental protection are located in EPA (or equivalent) offices under the executive branch. as semi-autonomous government agencies overseen by boards of directors. While legislation exists regarding pesticides, these entities have a mission that includes protection of the environment. Thus, their sphere of interest includes all stages of the chemical lifecycle, except production. Other offices at the national level which play a role in environment-related activities, include the Departments of Health and Social Affairs, Education, Resource and Development, Foreign Affairs, and Justice. Other offices at the state level include Agriculture, Public Safety, Health Services, Land and Natural Resources, and Economic Development. Each state’s executive branch has departments with similar functions.

The FSM Department of Health and Social Affairs and the four state Departments of Health Services focus on health promotion, disease prevention, and primary/secondary medical care. The national level health services office is primarily responsible for coordination with external financial arrangements, licensure, and standards of care. The state hospitals and clinics are where the provision of health services actually occurs. Chemicals are utilized in the diagnosis and in the treatment processes, to restore the health of the patient. The medical support staff, including medical supply technicians, radiologists, and laboratory staff have received training concerning the various uses of chemicals that they handle.

Chemicals may also be the cause of disease or injury and when a physician determines that exposure to a chemical substance has had a negative health impact on a patient, the doctor must determine if notification of the state EPA or Agriculture Office is in order. The exposure may have occurred as a result of improper storage, transport, distribution, handling, or disposal of hazardous chemicals. The physician’s decision must be made based on whether or not the exposure is a threat to the public health. The State Departments of Health are also responsible for the emergency medical response should a major incident involving exposure to toxic substances occur.

In the FSM, the agriculture departments serve to improve the production of locally grown food stuffs. This goal has dual benefits of providing additional nutrition to the diets of residents of the FSM and also reducing the need to import sometimes expensive and typically less nutritious foods from external sources. Agricultural agents assist farmers to improve crop yields and, in some cases,, may recommend the use of pesticides. These experts are thus involved in all aspects of the life cycle of agricultural chemicals except their production. Each state agriculture office employs fewer than ten persons.

The Pacific Community (SPC) maintains an Office on Pohnpei in which, at present, facilitates access to key services provided though its Land Resources Division including: genetic resources, sustainable forests and landscapes, sustainable agriculture, markets for livelihoods which include biosecurity and plant protection support services, with a contingency planning project for dealing with avian influenza among farm animals in the near future. The Plant Protection program assists the FSM government with quarantine efforts to identify and confiscate potential agricultural threats at the airports and seaports of the country.

This office also assists local efforts to identify and eradicate invasive species. The office maintains a plant health laboratory in Kolonia, Pohnpei, and provides training and oversight for activities which involve the use of chemicals in the eradication process. Those labs were used before under a FSM-SPC-LRD matching fund initiative as an immediate basic diagnostic facility. Activities include rearing of field collected arthropods for ID purposes. Lab reared specimens were then sent overseas for authentication. SPC could resume a similar engagement but facility would require an overhaul as it has been badly rundown.

One of the responsibilities of the Division of Trade and Investment under the FSM Department of Resource and Development is to facilitate the development of overseas markets for FSM products. Since many of these products are in the agricultural sector, the office is concerned that any chemical used by the farmer, be used correctly so that no compromise is made affecting the quality of the exported product. The Economic Development Offices at the state level have similar interests.

The FSM Department of Finance, through its Division of Tax and Revenue, has the responsibility of collecting import tax on all items imported into the nation. The Division’s duties also extend to the classification of all imported goods. The Customs Tariff Code System (Self Assessment Declaration, SAD) wasintroduced into the import paperwork. It has been proven to be a useful, but limited, resource for the collection of data regarding the amount and value of chemicals imported into the FSM. The further development of inspection/flagging of imports is an essential component to improve the control of potentially dangerous chemical imports into the country. . Unfortunately, the identification of POPs chemicals is not always possible from the information submitted/ collected on the SAD, and customs inspectors are not trained in the identification of imports that might contain hazardous substances, either containing POPs, or not.

The FSM national and the state level Departments of Justice have a responsibility to enforce the laws and regulations relevant to all aspects of the chemical life-cycle. They also serve to assist in the interpretation and clarification of the various laws regulating the management of chemicals. Both national and state legislative bodies responsibility to create relevant laws dealing with all aspects of chemical use in the country.

The FSM Department of Foreign Affairs has an indirect role with regard to the importation of chemicals from certain countries, particularly those nations not fully aware or otherwise unable to provide all of the necessary information about the substances that they are exporting to the FSM. The requirement that warnings and directions for use must be in English poses a current problem. The Department of Foreign Affairs can facilitate the proper exchange of information which would remove this obstacle to trade between the two nations.

Limited resources for chemical management activities impact the capacity to successfully perform roles and responsibilities. As the FSM’s demand for more chemical products increases, it will be necessary to provide additional financial and logistical support for all offices involved in the management of chemicals. It will also be necessary to provide a higher level of training for the numerous personnel engaged in chemical management. Training for Customs personnel who would inspect imports for dangerous chemicals is essential.

## 2.3 Assessment of the POPs issue in the country

## 2.3.1 Assessment of POPs pesticides (Annex A, Part I)

*1. Aldrin – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: A pesticide applied to soils to kill termites, grasshoppers, corn rootworm, and the other insects. Aldrin can also kill birds, fish, and humans. Aldrin is a white or tan to dark brown crystalline (sand-like) material. It also comes in a liquid form. It has a mild chemical odor. Aldrin can affect people when breathed in and by absorption through the skin.

Health Impact: It may decrease fertility in males and females. Low level exposure can cause skin and eye irritation and may damage the liver. High exposure can cause headache, dizziness, nausea and vomiting, muscle spasms, severe seizures, and death. In one incident, aldrin-treated rice is believed to have killed hundreds of shorebirds, waterfowl, and passerines along the Texas Gulf Coast when these birds either ate animals that had eaten the rice or ate the rice themselves. In humans, the fatal dose for an adult male is estimated to be about five grams. Humans are mostly exposed to aldrin through dairy products and animal meats. Aldrin builds up in the body and after years of exposure can begin to affect the nervous system.

Status: In the U.S., aldrin was completely banned in 1987. Other names for aldrin include: Aldrec, Aldrex, Aldrex 30, Aldrite, Aldrosol, Altox, Compound 118, Drinox, Seedrin, Octalene, and HHDN.

*2. Chlordane - Listed in Annex A, without specific exemptions/acceptable purposes*

Description: Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops, chlordane remains in the soil for a long time and has a reported half-life of one year. It is a combination of many chemicals and is a thick liquid whose colors ranges from colorless (clear) to amber which may be odorless or have a mild irritating smell. When used as a spray, Chlordane is mixed with emulsifiers which give it a milky-looking mixture.

Health Impact: Chlordane may affect the human immune system and is classified as a possible human carcinogen. It is believed that human exposure occurs mainly through the air, and chlordane has been detected in the indoor air of residences in the US and Japan. The lethal effects of chlordane on fish and birds vary according to the species, but tests have shown that it can kill mallard ducks, bobwhite quail, and pink shrimp. Chlordane exposure comes from skin contact, breathing contaminated air, or by digesting contaminated food. High exposure to Chlordane damages the nervous system, the digestive system and the liver. Large amounts swallowed will cause convulsions and death. Exposure to small amounts by ingestion or breathing can cause headaches, irritation, confusion, weakness, vision problems, stomach upset or cramps, vomiting, diarrhea, and jaundice.

Status: Chlordane’s use in the U.S. was stopped in 1988 but manufacture for export continues. Other names: Octachlor, Velsicol 1068, Aspon, Belt, Chloriandin, Chlorkil, Corodan, Cortilan-neu, Dowchlor, HCS 3260, Kypchlor, M140, Niran, Octaterr, Ortho-Klor, Synklor, Tatchlor 4, Topichlor, and Toxichlor

*3. Dieldrin – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: Used principally to control termites and textile pests, Dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils. Its half-life in soil is approximately five years. The pesticide Aldrin rapidly converts to Dieldrin, so concentrations of Dieldrin in the environment are higher than Dieldrin use alone would indicate. Thus, the characteristics of dieldrin are the basically the same as aldrin. Some brand names for dieldrin include Alvit, Dieldrite, Dieldrix, and Quintox.

Health Impact: Dieldrin is highly toxic to fish and other aquatic animals, particularly frogs, whose embryos can develop spinal deformities after exposure to low levels. Dieldrin residues have been found in air, water, soil, fish, birds, and mammals, including humans. Food represents the primary source of exposure to the general population. Dieldrin was the second most common pesticide detected in a US survey of pasteurized milk.

Status: Production banned in 1987 for all purposes. Some brand names for dieldrin include Alvit, Dieldrite, Dieldrix, Illoxol, Panoram D-31, and Quintox.

*4. Endrin – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control rodents such as mice and voles. Animals can metabolize endrin, so it does not accumulate in their fatty tissue to the extent that structurally similar chemicals do. It has a long half-life, however, persisting in the soil for up to 12 years. Endrin is a solid, white, almost odorless substance which has not been sold in the U.S. since 1986. Since endrin can remain in soil for as long as 10 – 12 years or more, it can be found in plants grown in contaminated soil. It is found in the tissues of organisms that live in water, and also in human breast milk.

Health Impact: In addition, endrin is highly toxic to fish. When exposed to high levels of endrin in the water, sheepshead minnows hatched early and died by the ninth day of their exposure. The primary route of exposure for the general human population is through food, although current dietary intake estimates are below the limits deemed safe by world health authorities. Exposure to high doses may result in headaches, dizziness, nervousness, confusion, nausea, vomiting, and convulsions. Swallowing very large amounts of endrin may cause convulsions and death in a few minutes or hours. Exposure to endrin usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site.

Status: Banned and has not been sold in the U.S. since 1986. Other names for endrin include: Compound 269, Endrex, Hexadrin, Isodrin, and Nendrin.

*5. Heptachlor – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: - Primarily used to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes. Heptachlor, in its pure form, is a white powder that smells like camphor. Commercial, less pure grades may be tan.

Health Impact: A possible human carcinogen. Heptachlor is believed to be responsible for the decline of several wild bird populations, including Canadian Geese and American Kestrels in the Columbia River basin in the US. The geese died after eating seeds treated with levels of heptachlor lower than the usage levels recommended by the manufacturer, indicating that even responsible use of heptachlor may kill wildlife. Laboratory tests have also shown high doses of heptachlor to be fatal to mink, rats, and rabbits, with lower doses causing adverse behavioral changes and reduced reproductive success. Heptachlor can damage the nervous system, and people who have swallowed it, or had skin contact, became dizzy, confused or had convulsions. Exposure is usually from eating contaminated foods and milk, or skin contact with contaminated soil. Heptachlor can remain in soil for many years and builds up in the fatty tissues of fish and cattle, and also shows up in dairy products. Exposure usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site. Heptachlor is found in human breast milk of mothers who have had high exposures.

Status: Use of the substance stopped in 1988. Trade names include: Heptagran, Basaklor, Drindrox, Soleptax, Termide, and Velsicol 104, Aahepta, Agroceres, Heptachlorane, Heptagranox, Heptamak, Heptamul, Heptasol, Heptox, Rhodiachlor, Veliscol heptachlor.

*6. Hexachlorobenzene (HCB) – Listed in Annexes A, without specific exemptions/acceptable purposes and Annex C*

Description: First introduced in 1945 to treat seeds, HCB kills fungi that affect food crops. It is also a by-product of the manufacture of certain industrial chemicals and exists as an impurity in several pesticide formulations. It is also released as a byproduct during the manufacture of certain chemicals. HCB has been used to make fireworks, ammunition, and synthetic rubber. HCB is a white crystalline solid, which is not very soluble in water. It deteriorates very slowly and thus remains in the environment for a very long time. HCB particles will settle to the bottom of lakes and rivers, where it can build up in fish, lichens, marine mammals, and then subsequently other animals (birds, caribou) that eat these things. Plants growing in contaminated soil will accumulate HCB’s.

Health Impact: In high doses, HCB is lethal to some animals and, at lower levels, adversely affects their reproductive success. HCB has been found in food of all types. A study of Spanish meat found HCB present in all samples. In India, the estimated average daily intake of HCB is 0.13 micrograms per kilogram of body weight. When people in eastern Turkey ate HCB-treated seed grain between 1954 and 1959, they developed a variety of symptoms, including photosensitive skin lesions, colic, and debilitation; several thousand developed a metabolic disorder called porphyria turcica, and 14% died. Mothers also passed HCB to their infants through the placenta and through breast milk. People are exposed by eating contaminated foods and dairy products, drinking contaminated water or milk, breathing contaminated air, or handling contaminated soil. Workers in factories which unintentionally produce HCB’s can be exposed. Unborn children can be exposed if the expectant mother is exposed. The health effects typically include liver disease and related complications, and studies show that it is likely a carcinogen.

Status: Was used in the U.S. until 1965. Trade names for HCB include: Amaticin, Anticarie, bunt-cure, Co-op hexa, Granox, Sanocide, Smut-go, Sniecotox, Bunt-no-more.

*7. Mirex – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: This insecticide is used mainly to combat fire ants, and it has been used against other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods. It is considered to be one of the most stable and persistent pesticides, with a half-life of up to 10 years. Mirex is a white crystalline solid which is odorless.

Health Impact: Mirex is a very persistent possible human carcinogen. Studies on exposure to laboratory animals have caused it to be classified as a possible human carcinogen. In studies mirex proved toxic to several plant species and to fish and crustaceans. The main route of human exposure to mirex is through skin contact, or eating food that is contaminated, particularly meat, fish, and wild game. A high level of exposure is linked to damage to skin, the liver, nervous system, and the reproductive system. Mirex can remain for years in soil and water and will build up in the tissues of fish or other organisms that live in contaminated water or eat other contaminated animals.

Status: The substance has not been manufactured or used in the U.S. since 1978. Other names are Dechlorane, Ferriamicide and GC 1283.

*8. Toxaphene – Listed in Annex A, without specific exemptions/acceptable purposes*

Description: This insecticide, also called camphechlor, is used on cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in livestock. Up to 50% of a toxaphene (half-life) release can persist in the soil for up to 12 years. Since it breaks down very slowly in the environment, it accumulates in fish and animals. Toxaphene was the most widely used pesticide in the US in 1975. It usually exists as a solid or gas, and in its original form is a yellow to amber waxy solid that smells like turpentine.

Health Impact: Very persistent, very toxic, and possible human carcinogen. For humans, the most likely source of toxaphene exposure is food. While the toxicity to humans of direct exposure is not high, toxaphene has been listed as a possible human carcinogen due to its effects on laboratory animals. It is highly toxic to fish; brook trout exposed to toxaphene for 90 days experienced a 46% reduction in weight and reduced egg viability, and long-term exposure to levels of 0.5 micrograms per liter of water reduced egg viability to zero. Breathing, eating, or drinking high levels of toxaphene can damage the lungs, nervous system, kidneys and can cause death. There is no information on the health effects of low-level exposures. Exposure typically occurs through contaminated air near hazardous waste sites, eating contaminated fish or shellfish, or drinking water from contaminated wells.

Status: Completely banned in 1990. There are many trade names for toxaphene, some are: Alltex, Attac 4-2, (also 4-4, 6, 6-3) Camphechlor, Compound 3956, Huilex, Motox, Strobane T-90, Texadust, and Vertac 90%, Altox, Attac, Camphechlor, Camphochlor, Camphoclor, Chemphene M5055, chlorinated camphene, Chloro-camphene, Clor chem T-590, Compound 3956, Huilex, Kamfochlor, Melipax, Motox, Octachlorocamphene, Penphene, Phenacide, Phenatox, Phenphane, Polychlorocamphene, Strobane-T, Strobane T-90, Texadust, Toxakil, Toxon 63, Toxyphen, Vertac 90%.

*9. Chlordecone – Listed in Annex A, without specific exemptions/acceptable purposes*

Full Name: 1,1a,3,3a,4,5,5,5a,5b,6-decachloro-octahydro-1,3,4-metheno-2H-cyclobuta-[cd]-pentalen-2one. Synonyms: Decachloropentacyclo(5.2.1.0'2,6.0'3,9.0'5,8)decan-4-one; decachlorooctahydro-1,3,4-metheno-2H,5H-cyclobuta-[cd]-pentalen-2-one; decachloroketone

Description: Used mainly as an agricultural pesticide. Chlordecone has been used in various parts of the world for the control of a wide range of pests, and in particular, it has been used extensively in the tropics for the control of banana root borer. It has been used as a fly larvicide, as a fungicide against apple scab and powdery mildew, to control the Colorado potato beetle, the rust mite on non-bearing citrus, and the potato and tobacco wireworm on gladioli and other plants. Chlordecone has also been used in household products such as ant and roach traps. The substance is an odorless tan-white crystalline solid.

Health Impact: Chlordecone is highly persistent in the environment, has a high potential for bio-accumulation and bio-magnification and based on physio-chemical properties and modeling data, chlordecone can be transported for long distances.

It is a possible human carcinogen and very toxic to aquatic organisms.

Status: Currently no use or production is reported, and many countries have banned its sale and use. Chlordecone was added to the POPs list in May 2009. Trade names: GC 1189; Kepone; Merex; ENT 16391; Curlone

*10 & 11. Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane (Alpha- and Beta-HCH) - Alpha- and beta-HCH - Listed in Annex A without specific exemptions/acceptable purposes*

Description: Alpha- and Beta-HCH are highly persistent in water in colder regions and may bio-accumulate and bio-magnify in biota and arctic food webs. These chemicals are subject to long-range transport, are classified as potentially carcinogenic to humans, and adversely affect wildlife and human health in contaminated regions. Alpha- and beta-HCH are produced as unintentional by-product of Lindane, which has been used as a broad-spectrum insecticide for seed and soil treatment, foliar applications, tree and wood treatment and against ecto-parasites in both veterinary and human applications

Health Impact: There are specific exemptions for the use of Lindane as a human health pharmaceutical for the control of head lice and scabies as second line treatment

Status: Trade Name: Lindane. The production of Lindane has decreased rapidly in the last few years and only few countries are still known to produce Lindane. For each ton of Lindane produced, around 6-10 tons of the other isomers including alpha- and beta-HCH are created. Large stockpiles of alpha- and beta-HCH are therefore present in the environment.

*12. Lindane – Listed in Annex A, with a specific exemption for use as a human health pharmaceutical for control of head lice and scabies as second line treatment*

Description: Lindane is a broad-spectrum insecticide for seed and soil treatment and many other uses including veterinary and human applications. All three isomers are highly persistent, bio-accumulate and bio-magnify.

Health Impact: It is a possible carcinogen. It adversely affects aquatic organisms and wildlife, causes immune system disorders, and is responsible for negative reproductive and developmental effects. Lindane is persistent, bio-accumulates easily in the food chain and bio-concentrates rapidly. There is evidence for long-range transport and toxic effects in laboratory animals and aquatic organism

Status: Lindane may be used as a second line treatment pharmaceutical for the control of head lice and scabies.

*13. Pentachlorobenzene (PeCB) – Listed in Annex A, without specific exemptions/acceptable purposes & Annex C.*

Synonyms: 1, 2, 3, 4, 5-pentachlorobenzene; pentachlorobenzene; PeCB; QCB; quintochlorobenzene

Description: PeCB was used in PCB products, in dyestuff carriers, as a fungicide, a flame retardant and as a chemical intermediate, e.g. previously for the production of quintozene. PeCB is a [persistent organic pollutant](https://en.wikipedia.org/wiki/Persistent_organic_pollutant), allowing an accumulation in the food chain. Consequently, pentachlorobenzene was added in 2009 to the list of chemical compounds covered by the [Stockholm Convention](https://en.wikipedia.org/wiki/Stockholm_Convention). PeCB is persistent in the environment and is bio-accumulative. The small spatial variability in the ranges of air concentrations across the Northern Hemisphere indicates that PeCB has a very long atmospheric residence time and is widely distributed in the global hemisphere. PeCB is also produced unintentionally during combustion, thermal and industrial processes. Today, a majority of the PeCB released into the environment is a result of yard trash burning and municipal waste incineration.

Health Impact: PeCB is moderately toxic to humans, but is very toxic to aquatic organisms, and decomposes on heating or on burning with the formation of toxic, corrosive fumes including [hydrogen chloride](https://en.wikipedia.org/wiki/Hydrogen_chloride) Combustion of PeCB may also result in the formation of [polychlorinated dibenzodioxins](https://en.wikipedia.org/wiki/Polychlorinated_dibenzodioxins) and [polychlorinated dibenzofurans](https://en.wikipedia.org/wiki/Polychlorinated_dibenzofuran). As a result of the long-range transport of PeCB, neither a single country nor a group of countries alone can abate the pollution caused by this substance. Unintentional release of PeCB as a byproduct of incomplete combustion appears to be the largest current source. Measures to reduce these releases can only be taken at a global scale.

Status: PeCB has been banned in the European Union since 2002 and was listed as a POP in May 2009. Parties must take measures to eliminate the production and use of PeCB and also take measures to reduce the unintentional releases of PeCB. The chemical might still be used as an intermediate.

*14. Pentachlorophenol and its salts and ethers – Listed in Annex A, with specific exemptions for production and use in utility poles and cross-arms*

Description: – First produced in the 1930s, it is marketed under many trade names. The main contaminants include other polychlorinated phenols, polychlorinated dibenzo-p-dioxins, and polychlorinated dibenzo furans. PCP has been used as herbicide, insecticide, fungicide, algaecide, disinfectant and as an ingredient in antifouling paint. Some applications were in agricultural seeds, leather, wood preservation, cooling tower water, rope and paper mill system. Its use has been significantly declined due to the high toxicity of PCP and its slow biodegradation.

Health Impact: People may be exposed to PCP in occupational settings through the inhalation of contaminated workplace air and dermal contact or with wood products treated with PCP. Short-term exposure to large amounts of PCP can cause harmful effects on the liver, kidneys, blood, lungs, nervous system, immune system, and gastrointestinal tract. Elevated temperature, profuse sweating, uncoordinated movement, muscle twitching, and coma are additional side effects. Contact with PCP can irritate the skin, eyes, and mouth. Long-term exposure to low levels such as those that occur in the workplace can cause damage to the liver, kidneys, blood, and nervous system. Finally exposure to PCP is also associated with carcinogenic, renal, and neurological effects

Status: At its seventh meeting in 2015, the Conference included the adoption of decisions listing pentachlorophenol and its salts and esters. FSM has not ratified the amendments of COP 4 through COP 7.

*15. Technical endosulfan and its related isomers – Listed in Annex A with specific exemptions for production and use on crop-pest complexes*

Description: Endosulfan is an insecticide which has been used for over 50 years to effectively control several pests, e.g. chewing, sucking and boring insects, including aphids, thrips, beetles, foliar feeding caterpillars, mites, borers, cutworms, bollworms, bugs, white flies, leafhoppers, snails in rice paddies, and tsetse flies. The appearance is a cream-to-brown colored solid that may appear in the form of crystals or flakes. It has a smell like turpentine. Endosulfan is used on a very wide range of crops. Major crops to which it is applied include soy, cotton, rice, and tea. Other crops include vegetables, fruits, nuts, berries, grapes, cereals, pulses, corn, oilseeds, potatoes, coffee, mushrooms, olives, hops, sorghum, tobacco, and cacao. It is used on ornamentals and forest trees and has been used in the past as an industrial and domestic wood preservative, and for controlling earthworms in turf. Endosulfan is persistent in the atmosphere, sediments and water. Endosulfan bio-accumulates and has the potential for long-range transport. It has been detected in air, sediments, water and in living organisms in remote areas, such as the Arctic, that are distant from areas of intensive use.

Health Impact: Adverse effects on a wide range of aquatic and terrestrial organisms. Bio-accumulates and can be transported long distances. Endosulfan is toxic to humans and has been shown to have adverse effects on a wide range of aquatic and terrestrial organisms. Endosulfan affects the central nervous system, preventing normal function. Hyperactivity, nausea, dizziness, headache, or convulsions have been observed in adults exposed to high doses. Severe poisoning may result in death. Exposure to endosulfan has been linked to congenital physical disorders, mental retardations and deaths in farm workers and villagers in developing countries in Africa, Asia and Latin America. Endosulfan sulfate shows toxicity similar to that of endosulfan

Status: A global ban on the manufacture and use of endosulfan was negotiated under the [Stockholm Convention](https://en.wikipedia.org/wiki/Stockholm_Convention) in April 2011, and the ban took effect in mid-2012, with certain uses exempted for five additional years. More than 80 countries, including the [European Union](https://en.wikipedia.org/wiki/European_Union), Australia, New Zealand, several West African nations, the United States, Brazil, and Canada had already banned it or announced phase-outs by the time the Stockholm Convention ban was agreed upon. It is still used extensively in India, China despite laws banning it, and few other countries. Trade Names: Thiodan®; Thionex; Endosan; Farmoz; Callisulfan, Tiovel.

*16. Perfluorooctane sulfonic acid (PFOS), its salts & perfluorooctane sulfonyl fluoride (PFOS-F) – Sulfluramid - Listed in Annex B with acceptable purposes for production and use for insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.*

Description: PFOS is both intentionally produced and as an unintended degradation product of related anthropogenic chemicals. The current intentional use of PFOS is widespread and includes electric and electronic parts, firefighting foam, photo imaging, hydraulic fluids and textiles. PFOS is extremely persistent and has substantial bio-accumulating and bio-magnifying properties. It has a capacity to undergo long-range transport and also fulfills the toxicity criteria of the Stockholm Convention.

Health Impact: PFOS levels in pregnant women have been associated with [preeclampsia](https://en.wikipedia.org/wiki/Preeclampsia). Increased levels have been associated with altered [thyroid hormone](https://en.wikipedia.org/wiki/Thyroid_hormone) levels in adults and an increased risk of elevated [cholesterol](https://en.wikipedia.org/wiki/Cholesterol). A 2009 study found that women with higher levels of PFOS and PFOA took longer to become pregnant than those with lower levels, suggesting that the chemicals may impair fertility. These substances do not follow the classic pattern of other POPs by partitioning into fatty tissues but instead bind to proteins in the blood and the liver. There is limited evidence of carcinogenic effect, but danger of serious damage to health by prolonged exposure if swallowed. May cause harm to the unborn child. Toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Status: Listed in the Stockholm Convention in May 2009. These chemicals are still produced in several countries.

*17. Dichlorodiphenyltrichloroethane (DDT) – Listed in Annex B, with acceptable purpose for disease vector control*

Description: DDT has been widely used worldwide for decades, to control disease and especially mosquito-borne disease. It was also sprayed extensively on many agricultural crops. DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. After the war, DDT continued to be used to control disease, and it was sprayed on a variety of agricultural crops, especially cotton. DDT continues to be applied against mosquitoes in several countries to control malaria. Its stability, its persistence (half-life in the soil is 10-15 years after application), and its widespread use have meant that DDT residues can be found everywhere; residual DDT has even been detected in the Arctic. It is a white, crystalline solid with no odor or taste.

Health Impact: Perhaps the best-known toxic effect of DDT is egg-shell thinning among birds. Its impact on bird populations led to bans in many countries during the 1970s. Although its use is banned in many countries, it has been detected in food from all over the world. Although residues in domestic animals have declined steadily over the last two decades, food-borne DDT remains the greatest source of exposure for the general population. The short-term acute effects on humans are limited, but long-term exposures have been associated with chronic health effects. DDT has been detected in breast milk, raising serious concerns about infant health. Exposure is mostly from eating foods (root and leafy vegetables, meat, fish, and poultry) which are contaminated. Near waste sites, both air and drinking water may be contaminated and lead to exposure. DDT affects the nervous system and causes excitability, tremors, and seizures. In women exposure may cause a reduction in the duration of lactation (breast milk production) and increased risk of premature child-birth. DDT probably causes cancer, but this is not yet confirmed.

Status: DDT was banned in the US in 1972 but continues to be applied against mosquitoes in several other countries to control malaria. Other names: Agritan, Anofex, Arkotine, Azotox, Bosan Supra, Bovidermol, Chlorophenothan, Chloropenothane, Clorophenotoxum, Citox, Clofenotane, Dedelo, Deoval, Detox, Detoxan, Dibovan, Dicophane, Didigam, Didimac, Dodat, Dykol, Estonate, Genitox, Gesafid, Gesapon, Gesarex, Gesarol, Guesapon, Gyron, Havero-extra, Ivotan, Ixodex, Kopsol, Mutoxin, Neocid, Parachlorocidum, Pentachlorin, Pentech, PPzeidan, Rudseam, Santobane, Zeidane, Zerdane.

#### 2.3.1.4 Use

*1. Aldrin*

As there has been a ban in effect for 33 years, there are therefore only likely to be traces of POPs pesticides in the environment. The results of any spills or releases into the environment will have very largely disappeared by degradation. There is limited information on current importation or use, of this item in the FSM, and no pre-1987 information is available.

*2. Chlordane*

As there has been a ban on Chlordane in effect for 32 years, there are therefore likely to be only traces of this POP pesticide in the environment. The results of any spills or releases into the environment will have very largely disappeared by degradation. There is limited information on current importation or use, of this item in the FSM, and no pre-1988 information is available.

*3. Dieldrin*

Almost certainly none, as there has been a ban in effect for 33 years. There is limited information on current importation or use, of this item in the FSM, and no pre-1987 information is available.

*4. Endrin*

Almost certainly none, as there has been a ban in effect for 34 years. There is limited information on current importation or use, of this item in the FSM, and no pre-1986 information is available.

*5. Heptachlor*

Almost certainly none, as there has been a ban in effect for 32 years. There is limited information on current importation or use, of this item in the FSM, and no pre-1988 information is available.

*6. Hexachlorobenzene (HCB)*

This substance may have been used during Trust Territory times. Usage declined when manufacturing ceased. It is unlikely that any importation into the FSM has occurred in the last 40+ years. There is very limited information on current importation or use of this item, so it is unknown if Hexachlorobenzene remains in the FSM in any significant amount.

*7. Mirex*

Information on current importation, or use, of Mirex in the FSM is unknown. No pre-1978 information is available.

*8. Toxaphene*

There has been a ban on Toxaphene in effect for 30 years; therefore, only traces of this POP pesticide are likely to be found in the FSM’s environment. The results of any spills or releases into the environment will have disappeared by degradation. There is limited information on current importation or use, of this item in the FSM, and it is unknown if any pre-1990 information exists.

*9. Chlordecone*

At this time, it is unknown if it is imported into the FSM, nor in what quantities, in case it is.

*10, 11 and 12. Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane and Gama hexachlorocyclohexane (Alpha- and Beta-HCH, Lindane)*

Lindane is presently being used as a second line treatment pharmaceutical for the control of head lice and scabies in the FSM’s health care system. There is no evidence and it is highly unlikely that Lindane continues to be imported into the country to be used for any other purpose. Stock reports from FSM health departments and private pharmacies indicate that Lindane was imported over last three years and is being used as a second line treatment in Pohnpei and Yap. Pohnpei State Hospital reportedly received 400 bottles (100ml) and have distributed them to the municipal dispensaries. Lindane is an item in Pohnpei State Hospital’s Essential Drug List. Yap state Hospital reported to have taken Lindane off their essential drug list a couple years back, but no specific date was reported. No stockpiles reported in Chuuk or Kosrae.

*13. Pentachlorobenzene (PeCB)*

Although it may be present in imported articles, the exact quantity of PeCB which has been brought into the FSM is unknown but is not expected to be significant.

*14. Pentachlorophenol and its salts and ethers*

This chemical has not yet been ratified by the FSM. National waste management practices will need to cope with problems related to the disposal of this substance.

*15. Technical endosulfan and its related isomers*

Endosulfan may have been imported into Micronesia in the past as an ingredient in insecticides, but details of any importation are no longer unavailable. Since the chemical was globally restricted only eight years ago, and given its level of persistence, traces of this chemical may still be found in the local environment. At this time there is no FSM current import or use information available on this substance.

*16. Perfluorooctane sulfonic acid (PFOS), its salts & perfluorooctane sulfonyl fluoride (PFOS-F) - Sulfluramid*

At the level of 2016, the report “Highly Hazardous Pesticides in the Pacific”[[8]](#footnote-8), prepared by Highly Hazardous Pesticides in the Pacific, revealed that sulfluramid was used in the FSM. Import data from FSM’s Department of Finance and Administration under the Division of Customs and Taxation reported that Sulphonamide was imported into Chuuk in 2019. As with other chemicals recently mentioned, the exact amounts imported are unknown.

*17. Dichlorodiphenyltrichloroethane (DDT)*

Please see section 2.3.7.

### 2.3.2.3 Assessment of PCBs (Annex A, Part II and Annex C)

18. Polychlorinated biphenyls (PCBs)

Description: The PCB compounds are used in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, and plastics. Of the 209 different types of PCBs, 13 exhibit a dioxin-like toxicity. Their persistence in the environment corresponds to the degree of chlorination, and half-lives can vary from 10 days to one-and-a-half years. PCBs are mixtures of chlorinated compounds and are either oily liquids or solids that are colorless to light yellow and have no known taste. Some PCBs can exist as a vapor in the air. They are man-made; there are no known natural sources of PCBs. PCBs are very long lasting and can be transported by air currents for long distances. Thus, they are everywhere in the environment, being released from hazardous waste sites, leaks from devices containing PCBs, and from the burning of contaminated items. PCBs bind strongly to soils.

Health Impact: PCBs are toxic to fish, killing them at higher doses and causing spawning failures at lower doses. Research also links PCBs to reproductive failure and suppression of the immune system in various wild animals, such as seals and mink. Large numbers of people have been exposed to PCBs through food contamination. Consumption of PCB-contaminated rice oil in Japan in 1968 and in Taiwan in 1979 caused pigmentation of nails and mucous membranes and swelling of the eyelids, along with fatigue, nausea, and vomiting. Due to the persistence of PCBs in their mothers' bodies, children born up to seven years after the Taiwan incident showed developmental delays and behavioral problems. Similarly, children of mothers who ate large amounts of contaminated fish from Lake Michigan showed poorer short-term memory function. PCBs also suppress the human immune system and are listed as probable human carcinogens. Most human exposure to PCBs comes from the consumption of contaminated fish and other animals which eat these fish. The most common health effects are skin diseases similar to acne or rash, and possibly liver damage. Many health organizations believe that PCBs are carcinogenic to humans. Women who are exposed to relatively high levels of PCBs may have lower birth- weight babies, and these babies may show abnormal responses in tests of infant behavior.

Status: The manufacture of these substances was stopped in the U.S. in 1977. There are many different mixtures of PCB compounds. Askarel, Aroclor, Pyranol, Pyroclor, Phenoclor, Pyralene are some of the trade names.

#### 2.3.2.1 Production

No PCBs production has ever occurred in the FSM.

#### 2.3.2.2 Import for destruction

Due to no capacity available to provide this service, the FSM has never imported PCB containing equipment to be destroyed.

#### 2.3.2.3 Export for destruction

Following the initial POPs in PICS (2005/6) a regional effort to remove PCB containing transformers was conducted by South Pacific Regional Environmental Program (SPREP). All contaminated transformers were exported for destruction.

Per their report on the POPs in PICs project, by 2006 SPREP had removed the following estimated amounts of POP from the FSM:

* Quantity of Chemicals 4,118 (kg)
* Quantity of Chemical Containers 1,347 (kg)
* Combined Casing Weight 10,500 (kg)
* Combined PCB Oil 5,165 (kg)
* Total 21,130 (kg)

#### 2.3.2.4 Use

The electrical distribution systems in the FSM states were the most dangerous sources of PCBs in the FSM at the time of the FSM’s first POPs activities in 2005-6. In the years following the first POPs in PICS effort, external expertise from (SPREP) visited the FSM and arranged for the removal all of the transformers that contained PCBs. Buildings constructed prior to the 1980s were inspected to identify any fluorescent lights still using the old style ballasts which contained PCBs. Following the first FSM POPs report, SPREP arranged for a regional effort to remove PCB containing items from several islands in Micronesia and elsewhere in the region. It is now believed that no known sources of PCBs remain in the FSM.

### 2.3.3 Assessment of POP-PBDEs (Annex A, Part IV and Part V), HBB (Annex A, Part I) and HBCD (Annex A, Part I and Part VII)

#### 2.3.3.1 POP-PBDEs

*19. Decabromodiphenyl ether (commercial mixture, c-decaBDE) – Listed in Annex A with specific exemptions for production and use inpParts for use in vehicles, aircraft, textile products that require anti-flammable characteristics, excluding clothing and toys, additives in plastic housings and parts used for heating home appliances, irons, fans, immersion heaters that contain or are in direct contact with electrical parts or are required to comply with fire retardancy standards, polyurethane foam for building insulation*

Description: DecaBDE is a [flame retardant](https://en.wikipedia.org/wiki/Flame_retardant). The chemical is used in production in "high impact polystyrene (HIPS) which is used in the television industry for cabinet backs, and also in automobiles. It is also used for "polypropylene drapery and upholstery fabric" by means of back coating and may also be used in some synthetic carpets. DecaBDE is released by different processes into the environment

Health Impact: Based on animal studies, the possible health effects of decaBDE in humans involve the liver, thyroid, reproductive/developmental effects, and neurological effects. In the general population, decaBDE has been found in blood and breast milk

Status: Listed on the new POPs list in May 2017.

*20. Hexabromodiphenyl ether and heptabromodiphenyl ether – Listed in Annex A, with specific exemptions for recycling of articles that contain or may contain these substances*

Description: Commercial mixture of octa-BDE is highly persistent, has a high potential for bioaccumulation and food-web bio-magnification, as well as for long-range transport. This product was used as a fire retardant in three main commercial products: acrylonitrile-butadienestyrene (ABS) thermoplastics for constructing machine housings such as motor housing and radio and TV parts, as a fire retardant in coatings and lacquers, and in polyurethane foam for auto upholstery.

Health Impact: The PBBs are endocrine disrupting chemicals, and effects are seen on reproductive capacity in rats, mink and monkeys. There is epidemiological evidence of hypothyroidism in workers exposed to polybrominated biphenyls and of increased incidence of breast cancer in exposed women.

Status: This chemical was added to the POPs list in May 2009. According to the available data, production and use of hexabromobiphenyl has ceased in most, if not all, countries. However, it is possible that hexabromobiphenyl is still being produced in some countries.

*21. Tetrabromodiphenyl ether and pentabromodiphenyl ether - Listed in Annex A with specific exemptions for recycling of articles that contain or may contain these substances*

Trade Names: Commercial pentabromodiphenyl ether; c-pentaBDE

Description: Commercial pentabromodiphenyl ether (c-pentaBDE) is a mixture of brominated flame retardants (BFRs), mainly isomers of pentabromodiphenyl ether and tetrabromodiphenyl ether. Brominated flame retardants are a group of brominated organic substances that inhibit or suppress combustion in organic material. C-pentaBDE is or has been used almost exclusively in the manufacture of flexible polyurethane (PUR) foam for furniture and upholstery in homes and vehicles, packaging, and non-foamed PUR in casings and electronic equipment (EE). They are also used to some extent in specialized applications in textiles and in industry. Emissions of PentaBDE can also occur from recycling and dismantling activities such as dismantling of vehicles, buildings and construction. The Commercial mixture of pentaBDE is highly persistent in the environment, bio-accumulative and has a high potential for long-range environmental transport.

Health Impact: These chemicals have been detected in humans in all regions. Concentrations in wildlife and in humans have also increased significantly. The chemical has no proven health effects in humans; however, based on animal experiments, it may have effects on the liver, thyroid, and neurobehavioral development. They thus represent a potential risk for future generations.

Status: Listed as POP chemical in May 2009

*22. Hexabromobiphenyl - Listed: Annex A, without specific exemptions/acceptable purposes*

Full Name: Hexabromo-1,1´-biphenyl; Synonyms: Hexabromobiphenyl; biphenyl, hexabromo; 1,1´- biphenyl, hexabromo -; HBB

Description: Hexabromobiphenyl was used as a fire retardant in three main commercial products: acrylonitrilebutadiene-styrene (ABS) thermoplastics for constructing business machine housings and in industrial (e.g. motor housing), and electrical (e. g. radio and TV parts) products; as a fire retardant in coatings and lacquers; and in polyurethane foam for auto upholstery.

Health Impact: The chemical is highly persistent in the environment, highly bio-accumulative and has a strong possibility for long-range environmental transport. Also, hexabromobiphenyl is classified as a possible human carcinogen and has other chronic toxic effects.

Status: According to the available data, production and use of hexabromobiphenyl has ceased in most, if not all, countries. The chemical was listed on the POPs list in May 2013. Trade Name: FireMaster(R) BP-6; FireMaster(R) FF-1.

##### 2.3.3.1.1 Production

There has never been, and currently there is no, production of POP-PBDEs in the FSM.

##### 2.3.3.1.2 Import

There is no indication that there has ever been import of POP-PBDEs to the FSM other than those in the EEE and the transportation sector mentioned below.

**EEE sector**

*POP-PBDEs in imported EEE*

As further explained below under the Tier II methodology of data collection, the POP-PBDEs amount in CRTs TVs and monitors in use in the FSM at the level of 2019 is estimated at 0.050 – 0.147 tons of hexa- and heptaBDEs and 0.345 – 0.475 tons of decaBDEs, both amounts range contained in 108 tons of polymeric fraction. The POP-PBDEs amount in flat screen TVs and monitors is estimated at 0.190 tons of. Hexa-, hepta- and decaBDEs contained in 69 tons of polymeric fraction.

**Transport sector**

*POP-PBDEs in imported vehicles*

The POP-PBDEs amount in vehicles in use/registered at the level of 2019 is estimated at 0.702 tons contained in 2159 tons of polymers (plastic, foams and synthetics)[[9]](#footnote-9).

##### 2.3.3.1.3 Export

There are no records indicating the exportation of POP-PBDEs and POP-PBDE substances/products from the FSM.

##### 2.3.3.1.4 Use

**EEE sector**

Tier I

According to the 2010 FSM Statistics[[10]](#footnote-10), 102,843 inhabitants were living in 16,767 households. In order to estimate the amount of POP-PBDEs in use in the FSM in 2019 (assumed the same numbers remain valid in the absence of an updated Census) under Tier I, it had to determine the number of CRTs (TVs and monitors) per capita. By calculation resulted that in one household lives 6.13 inhabitants. Assuming that there is one TV and one computer per one household, it has been estimated that there is 0.32 TVs and monitors/capita in the FSM. Furthermore, it was assumed that 50% of this amount is CRT TVs and monitors, resulting a number of 0.16 CRT TVs and monitors/capita. Based on this, the POP-PBDEs amount in EEE in use at the level of 2019 is estimated at 0.058 – 0.169 tons of hexa- and heptaBDEs and 0.395 – 0.543 tons of decaBDEs, both amounts range contained in 123 tons of polymeric fraction.

Tier II

In order to be able to estimate POP-PBDEs amount in use under Tier II, several assumptions were made, as follows:

* according to Housing and Household Census (FSM Statistics, 2010), 8444 households are with TVs and 1666 households are with computers, thus a total number of 10110 households hold TVs and computers at level of 2010; assuming that by 2019, this number increased with at least 5% per year, meaning that by 2019 the total number of households having TVs and computers is 14660.
* in one household lives 6.13 inhabitants (deducted from the census statistics – 102843 inhabitants living in 16767 households), thus in 14660 households live 89867 inhabitants;
* estimating that 0.32 TVs and monitors/capita (50% CRTs and 50% flat screen), then a number of 28758 TVs and computers is in use in the FSM (50% CRTs TVS and monitors = 14379 and 50% Flat screen TVs and monitors = 14379).

Based on this, the POP-PBDEs amount in CRTs TVs and monitors in use in the FSM at the level of 2019 is estimated at 0.050 – 0.147 tons of hexa- and heptaBDEs and 0.345 – 0.475 tons of decaBDEs, both amounts range contained in 108 tons of polymeric fraction. The POP-PBDEs amount in flat screen TVs and monitors is estimated at 0.190 tons of. Hexa-, hepta- and decaBDEs contained in 69 tons of polymeric fraction.

**Transport sector**

*POP-PBDEs in vehicles in use/registered*

Each state center island has a partially paved road system, with each state at different stages of paving roads distant from the main town. Nationally, the 2000 and 2010 censuses indicated that just over one-third of households owned at least one vehicle. Each state has a number of repair facilities including government facilities for school busses, ambulances, police cars, fire trucks, etc., and smaller private shops which might handle one to five cars simultaneously. There are fewer than 50 repair shops national-wide.

Disposal of old, broken vehicles is a related issue. Hundreds of such junk items are scattered along the roads and driveways of the nation. These items are dangerous, from both a physical trauma (lacerations, puncture wounds), but the possibility of exposure to toxic substances is also a very real risk. The discarding of junk vehicles is not regulated by any of the states.

According to the FSM Statistics[[11]](#footnote-11), in 2019 there was a number of 10,795 registered in FSM. Assuming that 75% of these vehicles are old cars, manufactured between 1975 – 2004, and the rest of 25% are manufactured between 2005-2017, the POP-PBDEs amount in vehicles in use/registered at the level of 2019 is estimated at 0.702 tons contained in 2159 tons of polymers (plastic, foams and synthetics)[[12]](#footnote-12).

##### 2.3.3.1.5 Recycling

**EEE sector**

Currently there is no formal e-waste recycling occurring in the FSM. Although, it has been encouraged to segregate e-wastes at the local dumpsites.

**Transport sector**

Although there is some awareness of the need for a Recycling Law, at this time, there are no resources such as knowledge and funding for automobile recycling. Achievement will be difficult without outside support (JICA 2013).

Dismantling is done by hand (parts are collected from engines, suspensions, etc.). In case of Chuuk scrappers have nibblers. Wire harnesses are collected with their covers and connectors intact. Scrap car bodies are crushed in presses. As for where recyclable scrap is sent, scrappers in FSM are mainly Chinese and send it to China, Taiwan, etc. (JICA 2013).

#### 2.3.3.2 HBCD

23 Hexabromocyclododecane

Full Name: 1,2,5,6,9,10-hexabromocyclododecane, listed in Annex A with specific exemptions for production and use in EPS and XPS in buildings

Description: HBCDD is used as a flame-retardant additive, with the intent of delaying ignition and slowing subsequent fire growth during the service life of vehicles, buildings or articles, as well as where materials are stored. The main uses of HBCDD are in flame-retarded expanded (EPS) and extruded (XPS) polystyrene foam for insulation and construction, with other uses in textile applications and electric and electronic appliances (high impact polystyrene/HIPS). In textiles, HBCDD is used in back-coatings for upholstery and other interior textiles, including automotive applications.

Health Impact: HBCDD has a strong potential to bio-accumulate and bio-magnify. It is persistent in the environment and has a potential for long-range environmental transport. It is very toxic to aquatic organisms. Though information on the human toxicity of HBCDD is to a great extent lacking, vulnerable groups could be at risk, particularly to the observed neuroendocrine and developmental toxicity of HBCDD.

Status: The volumes of HBCDD flame retarded articles imported and exported globally are generally unknown. Trade Names: Cyclododecane, hexabromo; HBCD; Bromkal 73-6CD; Nikkafainon CG 1; Pyroguard F 800; Pyroguard SR 103; Pyroguard SR 103A; Pyrovatex 3887; Great Lakes CD-75P™; Great Lakes CD-75; Great Lakes CD75XF; Great Lakes CD75PC (compacted); Dead Sea Bromine Group Ground FR 1206 ILM; Dead Sea Bromine Group Standard FR 1206 I-LM; Dead Sea Bromine Group Compacted FR 1206 I-CM.

##### 2.3.3.2.1 Production

No production of HBCD is taking place in the FSM.

##### 2.3.3.2.2 Import

This chemical may be imported as an ingredient in flame retardant materials, but details are unknown. At this time there is no FSM import information available on this substance.

##### 2.3.3.2.3 Export

##### There are no records indicating the export of HBCD or HBCD substances.2.3.3.2.4 Use

There are no records indicating the use of HBCD or HBCD substances in FSM. HBCD is used as a flame retardant additive, providing fire protection during the service life of vehicles, buildings or articles, as well as protection while stored. The main uses of HBCD globally are in expanded and extruded polystyrene foam insulation while the use in textile applications and electric and electronic appliances is smaller.

##### 2.3.3.2.5 Alternatives

The production of HBCD has decreased in the last few years and there are already available on the market chemical alternatives to replace HBCD in high-impact polystyrene (HIPS) and textile back-coating. After any alternative becomes available in commercial quantities, it will take some time for the industry to seek qualification and re-certification of polystyrene bead and foam products for fire‑rating.

### 2.3.4 Assessment of HCBD (Annex A, Part I and Annex C)

24. Hexachlorobutadiene - Listed in Annex A (elimination) without specific exemptions and in Annex C

Trade Names: C-46; Dolen-pur; GP40-66:120; UN2279; Synonyms:HCBD; perchloro-1, 3-butadine; perchlorobutadiene; 1,3- hexachlorobutadine; 1,3-butadiene, 1,1,2,3,4,4-hexachloro-; 1,3- butadiene, hexachloro-; hexachlorobuta-1,3-diene;

Description: HCBD is unintentionally formed and released from the production of certain chlorinated hydrocarbons, magnesium, polyvinyl chloride, ethylene dichloride and vinyl chloride monomer and incineration of acetylene, chlorine residues caused by poor abatement control. Previously, it was intentionally produced or used in the production of lubricants, as a solvent, a heat transfer liquid and hydraulic liquid. HCBD is not known to be currently intentionally produced or used. HCBD is long-range transported, persistent and highly toxic to aquatic organisms and birds. It can affect food chain due to its bioaccumulation and persistence

Health Impact: HCBD is long-range transported, persistent and highly toxic to aquatic organisms and birds. It can affect food chain due to its bioaccumulation and persistence. HCBD has been shown to cause irritation, nervous system depression and kidney damage when inhaled at higher levels. It may have an adverse effect to fatty liver degeneration as well. According to the EPA, it is classified as a possible human carcinogen.

Status: HCBD is not known to be currently intentionally produced or used. Since HCBD is an unintentional by-product, the Stockholm Convention requires parties to make efforts to eliminate the production and use of HCBD, and also take measures to reduce the unintentional releases of HCBD. Parties must take measures to eliminate the production and use of HCBD and also take measures to reduce the unintentional releases of HCBD. Other names: Amaticin, Anticarie, Bunt-cure, Bunt-no-more, Co-op hexa, Granox, No bunt, Sanocide, Smut-go, Sniecotox.

#### 2.3.4.1 Production

The FSM has been no production of organochlorine solvents or related chemicals where separation of HCBD occurring in the country.

#### 2.3.4.2 Import

#### At this time there is no FSM import information available on this substance.2.3.4.3 Export

#### There are no records indicating the export of HCBD or HCBD substances.2.3.4.4 Use

HCBD may be present in capacitors and transformers, as well as heat transfer liquids and hydraulic fluids (could be assessed within the assessment of PCBs and PCNs in these uses). No transformers/capacitors were additionally identified, since the last disposal through PICS project. In any case, AAt the end of their service life, products containing HBCD are likely to be disposed of in landfills, so in the absence of reliable information, improved national waste management practices will need to cope with problems related to the disposal of this substance.

### 2.3.5 Assessment of PCNs (Annex A, Part I)

25. Polyfluorinated Naphthalenes (PCN)

Listed in Annex A, with specific exemptions for production of those chemicals as intermediates in production of polyfluorinated naphthalenes, including octafluoronaphthalene, and the use of those chemicals for the production of polyfluorinated naphthalenes, including octafluoronaphthalene; and in Annex C. Synonyms: PCN; CNs; naphthalene chloro- derivatives.

Description: PCNs have historically been used in many applications including: use as wood preservative, as additive to paints and engine oils, and for cable insulation and in capacitors. PCNs are unintentionally generated during high-temperature industrial processes in the presence of chlorine. Of the known releases, combustion (primarily waste incineration) is considered the most significant current source. PCNs are also unintentionally generated with similar mechanisms as polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) during other industrial processes such as smelting in the secondary non-ferrous metal industry, cement and magnesia production, aluminum refining and coking.

Health Impact: After about twenty years of commercial production, health hazards began to be reported in workers exposed to PCNs: severe skin rashes and liver disease that led to deaths of workers. While some PCNs can be broken down by sunlight and, at slow rates, by certain microorganisms, many PCNs persist in the environment. Acute exposure causes chloracne. Chronic exposure increases risk of liver disease. Increased cancer risks have been suspected but so far not shown. Current concerns about PCNs include their release as byproducts of waste incineration.

Status: Listed in the Stockholm Convention in May 2015.

#### 2.3.5.1 Production

No production of PCNs is taking place in the FSM.

#### 2.3.5.2 Import

#### There are no records indicating the import of PCNs or PCN substances into FSM. Rather the alternative used in wood preservatives is copper naphthanate.2.3.5.3 Export

#### There are no records indicating the export of PCNs or PCN substances.2.3.5.4 Use

This chemical has not yet been ratified by the FSM. During the initial inventory efforts, items containing PCNs were found in wood preservative products on sale in the FSM. As a byproduct, this POP should be of particular concern to any FSM communities located near dump/landfill sites.

#### 2.3.5.5 Alternatives

Within the UNECE region, the information on substitution and alternatives is extremely limited, as PCN are not in use anymore. The only available information is that, since the production of PCN has stopped in the 1970s and 1980s, PCN have been substituted by other chemicals. These chemicals have not been identified and described (UNECE 2007).

### 2.3.6 Assessment of SCCPs (Annex A, Part I)

26. Short-chain chlorinated paraffins (SCCPs) - Listed in Annex A.

Description: Chlorinated Paraffins of various chain lengths, including SCCPs, have been used since the 1930s as a plasticizer in rubber, sealants, coatings, textiles, leather fat, paints, adhesives, flame retardants for plastics, and high-pressure lubricants. Other uses are in transmission belts, rubber conveyor belts, lubricant additives, tubes for outdoor decoration, bulbs, and metal processing. SCCPs are sufficiently persistent in air for long range transport to occur and it appears to be hydrolytically stable. The production of SCCPs has decreased globally as jurisdictions have established control measures and discovered substitutes.

Chlorinated paraffins are produced by chlorination of straight-chained paraffin fractions. The carbon chain length of commercial chlorinated paraffins is usually between 10 and 30 carbon atoms. Short-chained chlorinated paraffins are between C10 and C13. SCCPs (average chain length of twelve carbons, and average chlorine by weight of 60%) are POPs and there is also a focus on their longer chain chlorinated paraffins, known as Medium Chain Paraffins or MCCPs.

Health Impact: SCCPs are persistent in the air for long range transport. Many SCCPs can accumulate in biota. They lead to significant adverse environmental and human health effects. They are persistent and bio-accumulative, very toxic to aquatic organisms; they target the liver, kidney and thyroid, and are possible human carcinogens. MCCPs are also toxic to the aquatic environment and persistent. MCCPs in soil, biota, and most of the sediment cores show increasing persistence.

Status: Listed in the Stockholm Convention in May 2015. Production has decreased globally but they are still produced. Technically feasible alternatives are now commercially available for all uses.

#### 2.3.6.1 Production

No SCCPs production is present in the FSM.

#### 2.3.6.2 Import

#### There are no records indicating the import of SCCPs into FSM2.3.6.3 Export

#### There are no records indicating the export of SCCPs2.3.6.4 Use

This chemical has not yet ratified by the FSM. Again because of their widespread use for a very long time and their persistence, SCCPs will probably be present in the FSM, although probably at very low levels, given that worldwide production has substantially decreased, although it should be noted that they SCCPs are still being produced and may potentially still be appearing in products that are being imported. Their earlier widespread use will mean that SCCPs are probably also present in breakdown products from old waste dumping areas.

#### 2.3.6.5 Alternatives

Technically feasible alternatives are commercially available for all known uses of SCCPs.

### 2.3.7 Assessment with respect to DDT (Annex B, Part II)

17 Dichlorodiphenyltrichloro (DDT) - Listed in Annex B, with acceptable purpose for disease vector control.

Description: DDT has been widely used worldwide for decades, to control disease and especially mosquito-borne disease. It was also sprayed extensively on many agricultural crops. DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. After the war, DDT continued to be used to control disease, and it was sprayed on a variety of agricultural crops, especially cotton. DDT continues to be applied against mosquitoes in several countries to control malaria. Its stability, its persistence (half-life in the soil is 10-15 years after application), and its widespread use have meant that DDT residues can be found everywhere; residual DDT has even been detected in the Arctic. It is a white, crystalline solid with no odor or taste.

DDT has been used in the past in the FSM for disease vector (mosquito) control but little data concerning when, amounts used, or duration of use, is available. As a POPs listed chemical, DDT use in the FSM is banned as of the date on which the Stockholm Convention went into effect. Exemptions are possible in response to emergency applications of DDT. Presently, other, less dangerous, alternatives are in use for vector control.

Health Impact: Perhaps the best-known toxic effect of DDT is egg-shell thinning among birds. Its impact on bird populations led to bans in many countries during the 1970s. Although its use is banned in many countries, it has been detected in food from all over the world. Although residues in domestic animals have declined steadily over the last two decades, food-borne DDT remains the greatest source of exposure for the general population. The short-term acute effects on humans are limited, but long-term exposures have been associated with chronic health effects. DDT has been detected in breast milk, raising serious concerns about infant health. Exposure is mostly from eating foods (root and leafy vegetables, meat, fish, and poultry) which are contaminated. Near waste sites, both air and drinking water may be contaminated and lead to exposure. DDT affects the nervous system and causes excitability, tremors, and seizures. In women exposure may cause a reduction in the duration of lactation (breast milk production) and increased risk of premature child-birth. DDT probably causes cancer, but this is not yet confirmed.

Status: DDT was banned in the US in 1972 but continues to be applied against mosquitoes in several other countries to control malaria. Other names: Agritan, Anofex, Arkotine, Azotox, Bosan Supra, Bovidermol, Chlorophenothan, Chloropenothane, Clorophenotoxum, Citox, Clofenotane, Dedelo, Deoval, Detox, Detoxan, Dibovan, Dicophane, Didigam, Didimac, Dodat, Dykol, Estonate, Genitox, Gesafid, Gesapon, Gesarex, Gesarol, Guesapon, Gyron, Havero-extra, Ivotan, Ixodex, Kopsol, Mutoxin, Neocid, Parachlorocidum, Pentachlorin, Pentech, PPzeidan, Rudseam, Santobane, Zeidane, Zerdane.

#### 2.3.7.1 Production

No DDT production took place in the FSM.

#### 2.3.7.2 Import

Pohnpei import data revealed that DDT was imported in 2018, 2019, and 2020; and Yap reported to have imported DDT in 2018 and 2019, and Chuuk in 2019 (quantity unknown as it is not required for FSM National Customs Office to include in their database).



#### 2.3.7.3 Export

There has never been, and currently there is no, exportation of POPs, POPs containing products, or other pesticides from the FSM.

2.3.7.4 Use

DDT has been used in the past in the FSM for disease vector (mosquito) control but little data concerning when, amounts used, or duration of use, is available. There are stocks of DDT derivative, DEET, at the Hardware Stores. In August 2020, a DDT Registration form has been submitted to the Secretariat and WHO was made aware of FSM’s intention of using DDT as a disease vector control.

#### 2.3.7.5 Alternatives

DDT use for major pest control is necessary on a very occasional basis, such as following a typhoon in order to eliminate mosquito breeding areas. Historically this occurs less than once per decade. On such occasions an exemption is requested.

### 2.3.8 Assessment of PFOS, its salts and PFOSF (Annex B, Part III)

16. PFOS, its salts and PFOSF Listed in Annex B with acceptable purposes and specific exemptions.

Description: PFOS is both intentionally produced and as an unintended degradation product of related anthropogenic chemicals. The current intentional use of PFOS is widespread and includes electric and electronic parts, firefighting foam, photo imaging, hydraulic fluids and textiles. PFOS is extremely persistent and has substantial bio-accumulating and bio-magnifying properties. It has a capacity to undergo long-range transport and also fulfills the toxicity criteria of the Stockholm Convention.

Health Impact: PFOS levels in pregnant women have been associated with [preeclampsia](https://en.wikipedia.org/wiki/Preeclampsia). Increased levels have been associated with altered [thyroid hormone](https://en.wikipedia.org/wiki/Thyroid_hormone) levels in adults and an increased risk of elevated [cholesterol](https://en.wikipedia.org/wiki/Cholesterol). A 2009 study found that women with higher levels of PFOS and PFOA took longer to become pregnant than those with lower levels, suggesting that the chemicals may impair fertility. These substances do not follow the classic pattern of other POPs by partitioning into fatty tissues but instead bind to proteins in the blood and the liver. There is limited evidence of carcinogenic effect, but danger of serious damage to health by prolonged exposure if swallowed. May cause harm to the unborn child. Toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

Status: Listed in the Stockholm Convention in May 2009. These chemicals are still produced in several countries.

#### 2.3.8.1 Production

No production of PFOS, its salts and PFOSF is taking place in the FSM.

#### 2.3.8.2 Import

In the FSM, PFOS and PFOA may be present in imported articles, particularly fire extinguishing equipment. However, the exact quantities (PFOS and PFOA) which are imported into the FSM are as yet unknown. National waste management practices will need to cope with problems related to the disposal of these substances.

#### 2.3.8.3 Export

#### There are no records indicating the export of PFOS or PFOS substances.

#### 2.3.8.4 Use

At this time, there is no indication of PFOS/PFOA or PFOS/PFOA substances being used in the FSM.

2.3.8.5 Alternatives

While alternatives to PFOS are available for some applications, this is not always the case in developing countries where existing alternatives may need to be phased in. For some applications like photo imaging, semi-conductor or aviation hydraulic fluids, technically feasible alternatives to PFOS are not available to date. The chemical used in fire-fighting equipment in the FSM is shown in the picture above.

### 2.3.9 Assessment of releases of unintentional produced chemicals (Annex C)

#### 2.3.9.1 Description of uPOPs

*27. Polychlorinated dibenzo-p-dioxins (PCDD)*

Description: PCDD chemicals are produced unintentionally due to incomplete combustion, as well during the manufacture of pesticides and other chlorinated substances. They are emitted mostly from the burning of hospital waste, municipal waste, and hazardous waste, and also from automobile emissions, peat, coal, and wood. In addition, certain kinds of metal recycling and pulp and paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco smoke, and wood and coal smoke. There are 75 different dioxins, of which seven are considered to be of concern. One type of dioxin was found to be present in the soil 10 - 12 years after the first exposure.

Health Impact: Dioxins have been associated with a number of adverse effects in humans, including immune and enzyme disorders and chloracne, and they are classified as possible human carcinogens. Laboratory animals given dioxins suffered a variety of effects, including an increase in birth defects and stillbirths. Fish exposed to these substances died shortly after the exposure ended. Food (particularly from animals) is the major source of exposure for humans.

Status: These are unintentionally produced substances. Sources include traditional cooking and land clearing activities, and non-cultural activities such as operating an automobile or burning yard trash. In addition, certain kinds of metal recycling and pulp/paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco smoke, and wood and coal smoke.

*28. Polychlorinated dibenzofurans (PCDF)*

Description: PCDF compounds produced unintentionally from many of the same processes that produce dioxins, and also during the production of PCBs. They have been detected in emissions from waste incinerators and automobiles. Furans are structurally similar to dioxins and share many of their toxic effects. There are 135 different types, and their toxicity varies. Furans persist in the environment for long periods and are classified as possible human carcinogens. Dioxins and furans are produced from natural sources such as forest fires, as well as the man-made sources noted above. The substances can be carried long distances by air and water. As a result, dioxins and furans have existed for centuries, and are now found almost everywhere at low levels. These substances build up in the food chain, resulting in higher concentration in animals near the top, and humans.

Health Impact: Food, particularly animal products, is the major source of exposure for humans. Furans have also been detected in breast-fed infants. In the general population, 90% of exposure to dioxins and furans is by eating foods such as meat, dairy products, and fish. Other exposures come from contaminated air and water. People living near uncontrolled hazardous waste sites, or downwind from incinerators or power generation plants, may be at increased risk. The health problems which result from high exposures include severe skin disease (chloracne), rashes, skin discoloration, and possibly liver damage. Long term effects include possible altered glucose metabolism (similar to diabetes), and changes in hormone levels. Animal studies have shown an increased risk of cancer from exposure to dioxins and furans.

Status: Sources of these unintentionally produced furans are the same as dioxins.

*3. Hexachlorobenzene (HCB)*

Please see section 2.3.1. – Item #6

*Polychlorinated biphenyls (PCBs)*

Please see section 2.3.1 – Item #18

13. Pentachlorobenzene (PeCB)

Please see Section 2.3.1 – Item # 13

24. Hexachlorobutadiene (HCBD)

Please see Section 2.3.4

25. Polychlorinated naphthalenes (PCNs)

Please see Section 2.3.

#### 2.3.9.2 Sources of uPOPs in the FSM and summary of uPOPs inventory

There are a number of potential sources of uPOPs emissions in the FSM (Table 7). Estimates of the releases of uPOPs from these sources were not derived in 2007 during the first NIP. The estimation was conducted in 2019 (Table 8) using the 2013 UNEP Toolkit, using activity data derived from desktop reviews and on-ground investigations.

**Table 8. Potential Priority Sources of uPOPs Emissions in the FSM**

|  |  |
| --- | --- |
| **Source category** | **Activity** |
| Waste incineration | Medical waste incineration |
| Transport | 2- & 4-Stroke petrol engines  Diesel engines |
| Open burning processes | Waste dump burning  Accidental structure fires  Domestic waste burning  Domestic cooking (biomass)  Agricultural burning  Construction and demolition waste burning  Vehicle fires |

**Table 9. The FSM uPOPs emissions estimation summary (2019)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Source Groups** | **Annual Releases (g TEQ/a)** | | | | |
| **Air** | **Water** | **Land** | **Product** | **Residue** |
| 1 | Waste Incineration | 2.500 | 0.000 | 0.000 | 0.000 | 0.012 |
| 2 | Metal Production | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | Heat and Power Generation | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4 | Production of Mineral Products | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5 | Transportation | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 6 | Open Burning Processes | 0.427 | 0.000 | 0.071 | 0.000 | 0.000 |
| 7 | Production of Chemicals and Consumer Goods | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | Miscellaneous | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | Disposal | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10 | Potential Hot Spots | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **1-10** | **Total** | **2.931** |  | **0.071** |  | **0.012** |
|  | **Grand Total** | **3.014** | | | | |

The FSM unintentionally produces dioxins from various sources including small, cooking on wood fires, to large, megawatt capacity electricity generating plants. Contamination is possible from almost any of the potential sources listed above. Full extent of pollution is unknown.

One of the primary goals of this current POPs update effort is to expand the surveillance of this toxic substance. The updated Dioxin Toolkit requires an inventory of all POPs sources in the country and provides formulas to calculate the releases of dioxins produced from all sources, from small fires to large generators.

Further refinement of the uPOPs inventory is needed in the FSM and foreseen as activity in the relevant updated action plan.

#### 2.3.9.3 Description of the information collected related to the ten groups of the FSM’s uPOPs inventory

Group 1: Waste Incineration

There is no officially sanctioned open burning at any of the FSM’s dumpsites has occurred in the last decade. There are reports that scavengers will set fires to uncover buried recyclable metals such as aluminum. There is incineration of medical and quarantine wastes conducted on Pohnpei, when necessary. One incinerator was relocated from the hospital grounds to the dumpsite, but is no longer operational, so rather incineration is done either in a pit lined with a 55 gallon drum. Record are maintains that give approximate weight of medical debris delivered to the dumpsite. A new, yet to be installed incinerator, is in shipping crates in the parking lot at the rear of the hospital building. The installation date has not yet been determined.

In Kosrae State, a similar “pit” style set up is located on the state hospital grounds. There is no official data from Chuuk, but it is known that incineration does happen at the facility. Regarding Yap, it is reported that there is one functional incinerator.

FSM waste incineration is all the data for category C, “medical waste incineration”. There is no data for other categories.

E-waste being segregated at Pohnpei and Kosrae dumpsites.

Group 2: Ferrous and Non-Ferrous Metal Production

No metal production is occurring in FSM. Note that there are different collection and recycling programs for some such as lead reclamation from batteries, aluminum recycling, and at one time there were copper, steel, and brass reclamation activities. No other metal collection/reclamation/recycling activities are known to be occurring.

Group 3: Heat and Power Generation

Data for Power generation is pooled into group 5 “Transportation” under diesel engines. An estimated total of 4,328,697 gallons of diesel was consumed in 2019 for Power Generation, which equates to approximately 210.79 Terjoules of energy produced. A combined total of approximately 15,987 gallons of waste oil was produced at power generating plants in the country in 2019 (number is exclusive of waste oil at dumpsite).

No data on amount/volume of domestic cooking with the use of wood or biomass as a source of heat for cooking (category D), but it is the main source for cooking heat, particularly in the outer islands and atolls.

Group 4: Mineral Production

No mineral production is occurring in the FSM. The only asphalt mixing plant is located in Pohnpei. Pohnpei Transportation Authority-(PTA) has agreed to provide import data, but this information has not yet been received as of the submission deadline for this report.

Group 5: Transport

Note that total unleaded fuel consumption for 2019 does not differentiate from the different types of engines, that is whether it was used in a 4-stroke or 2-stroke engine. Total unleaded fuel is placed under 4-stroke engines.

Note: Total diesel consumption pools together diesel used for transportation and diesel used for the utilities as there is no category for diesel use under Group 3 “Heat and Power Generation”.

Group 6: Open Burning Processes

Reports from all four FSM states note that there has not been any officially sanctioned open burning at any of the nation’s dumpsites for at least eight years. While no data is available on amount/volume of trash burned at a household level for Category B Class 3, open burning of domestic waste, it is happening, particularly in the state centers and locations that are located far from a dumpsite.

It is estimated that out of 16,767 households counted in the 2010 census, approximately 9,738 households have a preferred cooking style which uses a wood stove or an open fire. A larger proportion of the nation who depend on the use of open burning methods for cooking are those who reside on the outer-islands. However, there are no accurate figures available for the volume of biomass burned for cooking.

Assuming the same number remains valid in the absence of an updated census, and assuming that at least 2 kg of wood is burned for cooking a day per household, an estimated country total of 7,108,740 kg (7,108.74 tonnes) of wood is burnt annually for cooking.

Last year a total of 20 accidental car fires and 58 reported accidental fires in houses.

Group 7: Production of Chemicals and Chemical based Consumer Goods

No production of chemicals is occurring in the FSM. Visual examination of various products in the country’s hardware stores shows no POPs listed as ingredients. It is worth noting here that calcium hypochlorite (aka chlorine) is used for water purification and was imported in 2019. However, the total quantity imported is not known and no data exists on how much was actually used.

Group 8: Miscellaneous

Data for Category e, “Tobacco smoking” is still pending. The FSM’s Tax and Revenue office has promised this information, but this data has not yet been received as of the submission deadline for this report.

Smokehouses are sometimes used in the production of copra, but it is very small scale, done at some households as a source of extra cash.

Group 9: Disposal

At this time no verification data is available for categories such as “Landfill”, and “Waste Dump”, to permit correct labeling of such sites in the FSM. No “Landfill Mining” occurs except on a very small scale, individuals collecting aluminum cans.

No sewage treatment occurs, except in Pohnpei which has a sewage treatment plant for the “urban” area of Kolonia. There is no data on open water dumping, but probably only fishing vessels contribute to this open water dumping of waste oil, rather than returning to port for waste oil collection. An estimated 15,987 gallons of waste oil was produced from the Pohnpei power plants during 2019 (data does not include what is already stored at dumpsite).

Group 10: Contaminated Sites and Hotspots

Visual inspections of potential contaminated sites and hotspots revealed the existence of five incinerators (most are inactive), a total of 34 active dredge sites; total of roughly 300 dumpsites (most sites are illegal), and a total of 84 accidental fires (house, cars, and land) occurred during 2019.

Visual examination of pesticide stocks in hardware stores show no POPs as ingredients. Note again that potentially there may be POPs in dumpsites.

### 2.3.10 Information on the state of knowledge on stockpiles, contaminated sites and wastes, identification, likely numbers, relevant regulations, guidance, remediation measures, and data on releases from sites

#### 2.3.10.1 Stockpiles

##### 2.3.10.1.1 POPs pesticides

There are no records of POPs pesticides stockpiles in the FSM.

##### 2.3.10.1.2 PCBs

No PCBs containing equipment stockpiles is known as still being present in the FSM.

##### 2.3.10.1.3 POP-PBDEs

Information presented under section 2.3.3.

##### 2.3.10.1.4 HBCD

##### There are no records of HBCD stockpiles in the FSM.2.3.10.1.5 HCBD

##### There are no records of HCBD stockpiles in the FSM.2.3.10.1.6 PCNs

##### There are no records of PCN stockpiles in the FSM.2.3.10.1.7 SCCPs

##### There are no records of SCCP stockpiles in the FSM.2.3.10.1.8 DDT

Information presented under section 2.3.7.

##### 2.3.10.1.9 PFOS, its salts and PFOSF

Information presented under section 2.3.8.

#### 2.3.10.2 Wastes

##### 2.3.10.2.1 POPs pesticides

No information available for pesticides other than DDT. Since under 2Kg of DDT is reported as imported into the FSM on an annual basis, it will be highly unlikely that any significant amount of the substance will be found in any of the FSM’s dumpsites. Expired pesticides in Pohnpei are stored in a run-down warehouse overseen by the Department of Health. However, upon inspection, there were no pesticides found on site.



##### 2.3.10.2.2 PCBs

No PCBs containing wastes are known as still being present in the FSM.

##### 2.3.10.2.3 POP-PBDEs

**WEEE**

WEEE is a growing problem for FSM, and an assessment was completed in 2009 [FSM Department of Health and Social Affairs, 2009]. However, none of the four FSM states currently have WEEE specific laws to enforce related stakeholder to properly handle e-waste and none of the three levels of government in FSM (national, state, municipal) have plans to initiate actions to address the e-waste situation (Mihai et al. 2019).

The Federated States of Micronesia (FSM) comprise the four states of Kosrae, Pohnpei, Chuuk and Yap. Each state is responsible for its own waste management. None of the four states are known to have any active programmes to collect e-waste. Kosrae and Yap have CDL systems that cover several items of beverage containers, and the Kosrae system includes Used Lead-Acid Batteries (ULAB). Pohnpei has a CDL system that only covers aluminium cans. Chuuk is actively looking at passing a CDL law and introducing a recycling Materials Recovery Facility (MRF) on Weno Island in Chuuk lagoon. Yap and Chuuk have significant remote, outer island, populations, where e-waste will be present but in low quantities, and recovery would be expensive. However, significant solar PV systems exist in outer islands, and some e-waste recovery tied to PV management is feasible.[[13]](#footnote-13)

Due to the lack of data, an estimation of POP-PBDEs amount in WEEE was not possible during this update.

**End-of-life vehicles**

*POP-PBDEs in end-of-life vehicles*

Most end-of-life vehicles are stored on private land. Some dumping of vehicles on vacant lots or other people's land is also seen. Because ownership of dumped vehicles cannot be confirmed, they are left untouched. According to a report prepared by Japan International Cooperation Agency (JICA) in 2013 (JICA 2013), it was estimated the number of end of life vehicles generated in the FSM in 2012 was 967. Assuming that by 2019 this number increased with at least 10% due to the fact that some other vehicles reached end of life, it is estimated that a number of 1064 of vehicles reached end of life in 2019. Also, it is assumed that the vehicles reaching end of life are manufactured between 1975 – 2004. Thus, the POP-PBDEs amount in end of life vehicles in 2019 is estimated at 0.085 tons contained in 213 tons of polymers (plastic, foams and synthetics)[[14]](#footnote-14).

##### 2.3.10.2.4 HBCD

No records of HBCD wastes in the FSM.

##### 2.3.10.2.5 HCBD

No records of HCBD wastes in the FSM.

##### 2.3.10.2.6 PCNs

##### No records of PCN wastes in the FSM.2.3.10.2.7 SCCPs

##### No records of SCCP wastes in the FSM.2.3.10.2.8 DDT

##### No records of DDT wastes in the FSM.2.3.10.2.9 PFOS, its salts and PFOSF

#### No records of PFOS/PFOSF wastes in the FSM2.3.10.3 Contaminated sites

The identification of potential marine contamination from sunken ship in Yap State is an important and urgent challenge to undertake, and therefore an action plan for such an undertaking is developed as part of this NIP. Also, the potential threat, caused by the fuels and other substances leaking from the Japanese navy ships sunk during World War II, to both the marine environment and human health in the Chuuk Lagoon islands cannot be overstated. After more than 60 years under water, the deterioration of the metals is accelerating and the quantities remaining in many of these vessels is unknown.

### 2.3.11 Summary of future production, use, and releases of POPs – requirements for exemptions

As a country that does not produce chemicals, the FSM has no plans to intentionally produce any of the POPs chemicals. In addition, the FSM does not have any plans to import any of these chemicals for use or release in the country. Still, there are still need for lindane to be used for head lice and DDT as a disease vector control, for which the FSM will register at BRS Conventions Secretariat. Clearly, however, based on section 2.3.9 above, uPOPs will continue to be released in the FSM from different activities.

### 2.3.12 Existing programs for monitoring releases and environmental and human health impacts, including findings

Disinfectants, containing chemicals which are not FDA approved, were discovered in stores in Guam as noted in a recent Guam newspaper. (23 April 2020, *Pacific News Center* (PNC), a multimedia news organization, Guam)

The Guam Environmental Protection Agency is warning island residents to stay away from disinfectant products that have not received the stamps of approval from the USEPA as they are investigating two unregulated products on local store shelves. The supply of disinfectant products on island has become scarce as demand has increased in the face of the COVID-19 pandemic, but Guam EPA spokesman Nic Lee warns that turning to products that are not regulated by USEPA can cause more harm than good.

In fact, Guam EPA is investigating reports of non-regulated disinfectant products sold at local stores. Lee says a concerned citizen alerted the agency. “The caller identified the product to the JIC, saying she wanted Guam EPA to issue an alert about it so the Pesticides Enforcement Program was informed about the unregistered product and we were able to identify the distributor. We were able to put a stop sales order on that product,” Lee said. The product is called Virus Shutout and it has so far been pulled off the shelves of least five local stores.

Lee says there may be other businesses impacted by the cease sale order so residents should be mindful of the disinfectant products they choose as there are dangers associated with the use of unregulated products. “There was no review on the effectiveness of the product so you may be applying a disinfectant product to disinfect a surface in your home or business that may not actually be doing what the product label claims,” Lee warned.

Drinking water in Saipan was also found to be contaminated with perfluorooctane sulfonate, or PFOS, and perfluorooctanoic acid, or PFOA. Both are on the POPs listing. (11 January 2020, *Pacific News Center* (PNC), a multimedia news organization, Guam)

High levels of PFOS and PFOA — also known as “forever” chemicals for their inability to break down easily — have been detected in the drinking water of several communities in the CNMI. The Commonwealth Utilities Corporation announced this week that it found unusually high levels of perfluorooctane sulfonate, or PFOS, and perfluorooctanoic acid, or PFOA, in the drinking water for Chalan Laulau, Iliying, Chalan Kiya, As Terlaje, Kannat Tabla, Fina Sisu, Oleai, and parts of southern Garapan, Gualo Rai, Susupe, As Lito, and As Perdido.

CUC advised residents of these areas to avoid drinking tap water, cooking with tap water, or making ice for consumption with tap water until the concentrations of PFOS and PFOA are reduced to EPA-recommended levels, so that residents can be protected from the adverse health effects that can result when people are overexposed to these chemicals over the course of a lifetime. Studies indicate that overexposure to PFOA and PFOS may result in negative developmental effects to fetuses during pregnancy or to breastfed infants (including low birth weight, accelerated puberty, and skeletal variations). In addition, high levels of PFOA and PFOS exposure can increase the risk of testicular and kidney cancer, liver damage, and thyroid and immune system problems.

### 2.3.13 Current level of information, awareness, and education among target groups; existing systems to communicate such information to the various groups

General POPs awareness building in the FSM is a challenge. The nation has been fortunate because no major, large scale health or environmental disasters caused by POPs or other dangerous chemicals have occurred in the country. Tragic disasters that have occurred in other countries, disasters which were caused by hazardous materials (including POPs), radioactive materials, or buried toxic wastes, have served to create a universal consciousness among most members of the affected populations, sensitizing residents to these important health and environmental issues. The publicity surrounding these unfortunate events has increased the number of people who have concerns about POPs and other hazardous wastes, which in turn increases public influence on both government decisions and social behaviors. The FSM, without such incidents, continues to face the challenge of making the general public aware of the potential risks posed by the use and disposal of POPs and other hazardous substances. Given the relatively fragile nature of the small island environments and the critical dependence of populations on these environments for food and livelihoods, the government must not wait for a major catastrophe before undertaking a wide-ranging awareness building effort.

### 2.3.14 Mechanism to report under Article 15 on measures taken to implement the provisions of the Convention and for information exchange with other Parties to the Convention

Due to limited technical capacity, the FSM has not sent any of the progress reports on meeting their objectives as required by the Stockholm Convention Secretariat.[[15]](#footnote-15) The FSM, however, is planning to submit its first report after the submission of this updated NIP. It does attend COP meetings where the national status of chemical management is disseminated. A more integrated mechanism to manage Stockholm Convention requirements is required in the future, and this is addressed in the action plan 3.3.13.

### 2.3.15 Relevant activities of non-governmental stakeholders

Each of the following Non-Government Organizations have to potential to impact the POPs situation on the islands where they are located. The focus varies from educational activities, women’s interests, health issues, community development, to conservation. The organizations’ websites provide additional information.

* Conservation Society of Pohnpei - CSP
* Micronesia Conservation Trust – MCT – (regional, with office on Pohnpei)
* Kosrae Conservation and Safety Organization - KCSO
* YAP Community Action Program - YAP CAP
* Island Food Community of Pohnpei – IFCP
* Yela Environment Landowners Association – YELA - Kosrae
* Society for Historic Investigation & Preservation – Helping Ourselves: Outreach Programs in Sports - SHIPHOOPS - Chuuk
* Marine & Environmental Research Institute of Pohnpei – MERIP
* Chuuk Women Council – CWC
* Island Research & Education Initiative – iREi - Chuuk
* Chuuk Conservation Society

### 2.3.16 Overview of technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, research and development – linkage to international programs and projects

Given the small size of the FSM, it is most economically viable for the nation to utilize regional testing facilities for the small volume of tests performed. The existing laboratories in the FSM are those found in the EPA offices, on the campuses of the College of Micronesia-FSM, in the four state hospitals, and in the high schools. Only some of these laboratories can be considered as having any capacity for analytical chemistry work. None of these facilities are presently equipped to handle detailed chemical analysis. The EPA laboratories are primarily focused on water quality screening, while the college labs are instructional in nature.

Some of these facilities could potentially develop the capacity to perform a wider scope of chemical analysis; however, it will take significant lead time and financial resources to reach international standards. The demand for a particular in-country test must also be balanced against cost and frequency of that test to determining if the investment of in-country testing creates a more cost-efficient arrangement. Having additional well-trained local capacity to effectively handle as wide a scope of testing as possible, will be an economic benefit to the nation.

### 2.3.17 Overview of technical infrastructure for POPs management and destruction

A major problem with consumer chemicals and other chemical substances in the FSM is the failure to properly dispose of unused portions and empty containers. The main issue here is the lack of properly engineered and operated disposal facilities/sanitary landfills in many areas of the country. In consideration of the relatively small population and small utilization of chemicals, this disposal issue is not a priority under the management of chemicals, but rather an infrastructure development problem that each state must, sometime very soon, address with long-term environmentally sound and sustainable solutions. Given the fragile island ecosystems proper waste disposal is a very important issue.

### 2.3.18 Identification of impacted populations or environments, estimated scale and magnitude of threats to public health and environmental quality, and social implications for workers and local communities

The purpose of this section is to provide updated information concerning the negative health and environmental impacts that toxic substances, many of them categorized as POPs, can cause to populations and island terrains in the Federated States of Micronesia. This, and other related documents, comprises the FSM’s updated National Implementation Plan (NIP) for the management of POPs and other hazardous chemicals. Although the data that exists in the FSM is determined to have a medium confidence level, data on many of these POPs is very limited. A major part of collecting this updated information for the national assessment of the negative health and environmental impacts caused by POPs, will depend upon identification of any POPs ingredients contained in imported products to accurately define the links between possible exposures and illnesses.

The Stockholm Convention entered into force on 17 May 2004. The ratification period of the Convention was one of the shortest in UN history. The Convention identified a list of twelve (12) priority chemicals which were termed Persistent Organic Pollutants, or POPs. This list was subsequently expanded to include 28 chemicals and groups of chemicals. Upon ratification of the Stockholm Convention, a party nation is required to develop, endeavor to implement, and update as appropriate, a National Implementation Plan (NIP), outlining how its obligations under the Convention will be met.

This current NIP update covers the expanded list of 28 POPs chemicals and groups of chemicals listed under the Stockholm Convention to date (2018). The NIP has been developed in accordance with guidelines provided by the United National Environment Program. This new document reports on both the original twelve POPs chemical, but perhaps more important, it focuses, as well, on the new POPs. Many of these new POPs, like the first dozen, are found in products that may have frequent use in Pacific communities. Most exposures to the new POPs are unintentional, coming from products which contain these substances, or items that release such substances when burned, or circumstances where the substances can contaminate air, soil or water.

There no large manufacturing plants/factories in the country. The FSM’s circumstances of a relatively isolated geographical location, a very small population, extremely small land area, and limited natural resources, all interact to create a business environment not very conducive to any but the smallest of industry. Fish processing, construction, road building, dry-docking, and coconut processing are among the largest industries in the country. Small industries such as vehicle and small engine repair shops are found wherever there are roads and outboard motors.

The other smaller industries are more of the cottage” size and include handicraft weavers and carvers, and tailor/seamstress shops, and tiny “Mom & Pop” stores servicing the village with the same set of staples as the other dozens of similar stores.

Health Care needs to be included in the category of large industry. All states have government hospitals and a system of clinic or dispensary facilities. There are also private hospitals and clinics in Chuuk and Pohnpei.

The amount of effort necessary to provide fuel to generate the electricity to run the island, from cell-phone chargers to giant machines generating megawatts of power, is another one of the larger state-wide industries found in each FSM state. This fuel also runs our vehicles and boat motors, fills lanterns to provide light, cooks and refrigerates our food, and pumps water into our houses. Electricity generation is an industry which is one of the essentials for modern life on the islands

The air and sea transport industry is another large industry, important for holding open the doors to the outer world and to the outer islands. Transportation is also an industry which is one of the essentials for modern life on the islands, but which uses many different chemicals.

The final large industry is “Tourism and Hospitality”. While there are no major hotels with hundreds of rooms, each of the main islands, and some of the outer islands, have hotels which provide a good tourist experience. Restaurants, taverns, tour guides, rental car, wreck diving, WWII site exploration, waterfalls, beaches, and lush green jungles are attractions.

During the period since the original POPs report it is expected that development could potentially lead to additional new and health-related burdens for the nation. The preparation of this overview is one of the activities necessary for the development of the FSM’s up-dated National Implementation Plan (NIP) for Persistent Organic Pollutants (POPs).

Most of the following information comes from the Stockholm Convention (United Nations Development Program) website, the Agency for Toxic Substances and Disease Registry of the Centers for Disease Control and Prevention website, the Agency for Toxic Substances and Disease Registry, and the Inter-website of the Organization for the Sound Management of Chemicals.

### 2.3.19 Details of any relevant system for the assessment and listing of new chemicals

The approaches and procedures to chemical management are efforts primarily conducted at the state level. Each of the four FSM states has an office responsible for EPA-related activities, (3 EPA’s and KIRMA in Kosrae). The actual implementation activities, regardless of the sector, usually occur at the state level. Concerning the control of chemicals, limited information exists since, to date, this matter has not been one of the high priority topics of discussion in the nation. Pesticide registration is the only major chemical management work being done by the states at this time. Registration forms that collect information concerning the import and use of pesticides have been developed by each state. Since state level staff are responsible for efforts protecting the local environment and possess the most extensive and accurate knowledge of the situation in their particular state, it is reasonable for most of the monitoring and enforcement activities to be handled by the state governments. The EPA Administrator holds the power to suspend and revoke licenses, have access to records, inspect shipments, restrict and ban use, seize materials, and issue “stop sale, stop use, or removal” orders. However, without sufficient resources and support from the national level devoted to the state monitoring and enforcement activities, the effort will be weak.

The information in table 3 of section 2.2.1 provides an overview of what legal mechanisms exist to control various aspects of importation, sale, storage, application, handling, use, distribution, disposal, and removal of chemicals used in pesticides and insecticides. The regulations also identify certain investment activities which are prohibited anywhere in the territory of the country due to the chemical associated risks involved.

### 2.3.20 Details of any relevant system for the assessment and regulation of chemicals already in the market

The FSM has no suitable laboratory to test for the full range of POPs. Existing small scale laboratory tests are done at EPA, and water testing by the utilities provider, and the country‘s four main health facilities perform medical lab assessments.

Testing for POPs has been undertaken at the state level where appropriate training and equipment has been provided. Testing of soil and groundwater in and around contaminated sites requires more meticulous testing procedures and may need external technical assistance.

Detailed testing for POPs will require that samples be collected and sent to external, appropriately accredited laboratories. Besides pesticides, there is no systematic assessment and regulation of chemicals in the market or at the importation point. At this stage of time, due to the relatively small number of chemicals being imported into the FSM, government capacity is largely occupied with competing national and state priorities.

## 2.4 Implementation status

Progress to date in implementing the Convention since the initial efforts 14 years ago has been minimal. The most important accomplishment has been the removal of PCB containing items from the country. The working groups created back in 2006 have not been active and POPs producing practices, such as open burning of trash by households, continues among the general public.

# 3. Strategy and action plan elements of the national implementation plan

## 3.1 Policy statement

The FSM recognises the national and global environmental and public health risks of POPs and other hazardous chemicals and wastes, and is committed to taking national action to reduce and eliminate the use and unintentional releases of these chemicals, in accordance with its obligations as a Party to the Stockholm Convention.

The FSM Government arecognises that economic development will likely lead to an increase in the importation of chemicals and articles potentially containing POPs, and if improperly managed, these items will potentially have immediate and prolonged adverse impacts to the environment and health of the FSM inhabitants.

Faced with these realities, the FSM Government believes that a core focus of the NIP must be to improve the management of all chemicals and wastes in the country, in order to protect human health and the environment. The revision and subsequent implementation of this NIP helps to achieve a clear pathway for the management of POPs and thereby reduce the potential economic and environmental costs that result from their mismanagement.

Building on the initial NIP implementation process in 2005/6, the Government is committed to addressing identified shortcomings and to strengthen the updated NIP implementation process, focusing on enhancing co-operation and co-ordination among stakeholders. The FSM Government is committed to the implementation of this NIP through the FSM DECEM. The Government endorses this NIP to reaffirm its commitment to addressing the national management of POPs in accordance with its obligations under the Stockholm Convention.

The FSM Government it is aware that POPs management is just a small part of national chemicals and waste management. It is the Government view that an integrated approach that utilises financial and human resources more efficiently for national chemicals and waste management would assist in attracting interested donors in this area of endeavour. The Government will identify and attempt to attract additional funding to successfully implement the NIP and Stockholm Convention by matching FSM’s priorities with those of potential donor areas including SDGs, climate change, and biodiversity protection activities.

## 3.2 Implementation strategy

The FSM’s implementation strategy includes six components which can be tackled in the following sequence:

1. Governance,
2. POPs National Inventory
3. Legislative Revision,
4. Importation Control,
5. In-country Contaminated Site De-contamination, and
6. Public Awareness

However, there is much scheduling flexibility possible as only some components have prerequisites. Components 1, 2, and 6 could all be undertaken at the beginning of the implementation period. Components 3, 4, and 5 require information that will be gathered during the POPs inventory, and thus will need to wait until that information is available.

The four FSM’s state level stakeholders’ groups will be established and organized first, and combined, will serve as the overall national coordinating body. This group will replace and take over the functions of the original POPs National Coordinating Committee created following the development of the FSM’s first NIP. The main function of the stakeholders groups is as the mechanism to coordinate NIP activities including review, reporting, evaluation, revision, and updating of the NIP. The establishment of the new stakeholder groups in the FSM states should be completed within less than three months after the project start date, and have a minimum of one annual meeting per year, with other meetings called as needed.

Secretariat services will be provided by the EPA/KIRMA organizations at the state level, while DECEM will assist with national level activities. Meeting preparation and organization, recording of membership and official proceedings, internal and external communications, on-going maintenance of files and records (including POPs and other hazardous items lists, contaminated sites lists, and other relevant information) are all within the five secretariats’ scope of work.

Other sub-working groups will be formed to focus on the work involved in the various action plans. At the state level, the four EPA (or equivalent) offices will be the responsible party for most of the implementation of the various activities included in his NIP. A minimum level of financial, staffing, operational, and logistical support will be necessary in each state. The development of an effective communication system will also be needed to support the work.

National and state levels workshops, face-to-face or virtual, will provide for the dissemination of information, conduct needed trainings and coordinate monitoring efforts as required in the various action plans. From time to time external technical assistance in the form of short-term consultants will be needed, and the creation of newsletters, databases, and other electronic resources will require either internal or external capability in this area.

In tandem with the development and institutionalization of stakeholder capacity, the focus of POPs activities will be to identify the POPs chemicals currently in, and those being imported into, the FSM. This does not only include POPs-containing products, but also any sites or physical locations, terrestrial and marine, which have been contaminated or otherwise impacted in some manner by POPs chemicals. The creation of a comprehensive FSM National Inventory of POPs is the initial step, to be followed by prioritization of the relative negative impact of the substances to the environment and human health. It can then be determined how best to the most dangerous substances first. State level staff will conduct the inventory in their respective states.

With the information available from the national inventory, it is now possible to examine the present chemical management legal framework to determine if any gaps prevent the legislative “package” from being sufficiently comprehensive to protect the country. Stakeholders will advocate for new “gap-eliminating” legislation in each state and at the national level.

Since the intentional production of POPs chemicals is non-existent in the FSM, the primary methodology for effective control POPs coming into the nation is good quality importation procedures. This will be done through legislation and capacity building of the staff of the FSM customs inspection service.

Another in-country priority for the FSM is the reduction of the unintentional production of dioxins and furans. The other, equally important, in-country POPs issue is the identification and clean-up of any POPs contaminated sites. Careful monitoring of all of the “life phases” of POPs chemicals (importation, marketing and distribution, use, storage, and disposal) is necessary to the identification of possible contaminated sites.

Public education and awareness efforts will be critical in promoting general awareness of POPs in the FSM. Public education and awareness will be coordinated by working group to assist the state and national Departments of Education to develop a POPs Awareness Program to be included into the national school curriculum. General public awareness activities will include the use of on-line, radio, and hard copy (print) media, as well as public presentations and exposure on environmental protection “days”, such as “Earth Day” (each year on 22 April).

Various factors will influence the timing of the activities called for in the action plans. The plans that address legal framework development, hazardous waste removal, contaminated site clean-up, and PCB disposal, call for activities which will be conducted over a period of time and then be concluded, as the objectives will have been achieved. The other action plans call for programs and projects of a more continuous nature. Public education efforts will be on-going for a long period of time until the POPs threat is eliminated. The need to safely handle pesticides will exist as long as these chemicals are in use in the nation. Leaks from old sunken ships are occurring now, and the potential for additional new spills increases with every new ship which enters the FSM’s waters. Capacity building will be a long-term endeavor, the country’s economic situation makes it difficult to recruit and/or retain highly qualified professionals, whether indigenous or expatriate.

Some of the action plans have a degree of overlap in both planning and implementation. Some of the plans build on the accomplishments of others. For example, it will be necessary to complete a legal framework for the safe management of POPs and other dangerous substances before the appropriate offices and agencies can enforce new laws and regulations. Efficient use of personnel resources is very important as existing human resources are limited.

The action plans included in the FSM’s NIP follow. Plans include resource requirements when needed and a timeframe for the activities in that plan. Due to uncertainty concerning the COVID pandemic, the actual dates when implementation activities are scheduled and will commence will be, to the extent necessary, on a flexible schedule.

## 3.3 Action plans, including respective activities and strategies

### 3.3.1 Activity: Institutional and regulatory strengthening measures

#### 3.3.1.1 Context and analysis of issue

The effect of pollution on the terrestrial, marine and freshwater environment is a major concern for the sustainable development of the Federated States of Micronesia (FSM). The nation’s small land size, isolation and subsistence dependence on the environment greatly increases the nation’s vulnerability to contamination by solid, liquid and toxic wastes and chemicals. Both marine and terrestrial environments are of priority concern in the FSM with regards to issues of biodiversity and contamination by hazardous wastes, particularly persistent organic pollutants (often referred to as “POPs”). Direct and indirect exposures have detrimental impacts on human and wildlife morbidity and mortality, primarily due to the process of bioaccumulation. The current level of pollution from solid and liquid waste, is mostly contained in imports to the country, but with some that are derived from domestic sources in the FSM. The level of pollution is increasing, particularly in the vicinity of the main population centers and other areas where the population density is growing.

With the strong emphasis by the FSM’s national and state governments on economic development and the current population growth rate it is anticipated that the generation of waste, both solid and liquid, will constantly increase both in quantity and characteristics in the future. The institutional weaknesses of environmental health management are exacerbated by the need for up-to-date legislation, and a limited supply of properly trained human resources. Revision of pesticide legislation including registration and management of pesticide cycle approach from pre-registration to disposal of empty containers should be considered a priority.

The need for up-to-date legislation is a major impediment to adequately support a comprehensive process of POPs and other hazardous chemical management and enforcement in the country. FSM laws (Title 25. Environmental Protection Act, Subtitle 1. Trust Territory Environmental Quality Protection Act) ban or restrict the importation of many dangerous substances, including most POPs containing substances into the country. However, these laws are due for up-dating as many more dangerous substances have been added to the list. The four State Environmental Protection offices (three EPAs and the Kosrae Island Resource Management Authority (KIRMA)) require registration of all pesticides or insecticides brought into the country. However, the implementation of the inspection process has been inconsistent during the last several years and is further challenged by the unintentional importation of hazardous substances included in new dangerous chemicals in certain products. In addition, the inspections of imports are administered by customs officials, who are not necessarily qualified to identify hazardous chemicals or similar substances.

No formally organized pool of expertise in the area of hazardous waste management exists in the FSM. The State EPA Agencies have varied, but limited, levels of capacity depending on past educational attainments of the staff and other relevant trainings which have been provided, including workshops, on-the-job instruction and more formal courses at overseas intuitions or laboratories.

The shortage of trained professionals across the environmental health sector is a contributing factor to environmental health concerns in this country. There is a need to develop and organize an appropriate local body of POPs, and other hazardous substances expertise, so that appropriate in-country capacity exists to address problems in this important area. Lower individual country costs could be realized by utilizing a regional approach to some of the work.

#### 3.3.1.2 Goals and objectives

The overall goal in the FSM is to strengthen the institutional and regulatory framework for environment and health protection in general and for POPs management in particular. There are three specific objectives listed under this action plan to reach this goal, namely:

* To update legal support (legislation and regulations) for the POPs Action Plans implementation
* To increase and develop staff expertise, knowledge, and skills (by the provision of appropriate long-term postgraduate training methodologies)

To upgrade laboratory facilities and other infrastructure, as necessary, to enable the accurate identification and determination quantities of POPs and other hazardous materials found in the FSM.

#### 3.3.1.3 Relevant management options

Although the POPs Convention was ratified by Congress of the FSM in 2004, there remain necessary components of the FSM’s NIP that have not yet been fully implemented. These missing pieces need to be in place in order the FSM to fully implement this legally binding treaty. To enforce the regulations and effectively administer steps to improve the infrastructure and human resources need to implement the terms of the convention in the country, both human and financial resources are needed. Investing in the FSM’s human resources strengthens management capacity. In turn, this leads to improvements in policy development and program planning.

An assessment of existing legal, institutional, administrative, and technical infrastructures will provide guidance to assist with:

1) Identifying priorities and shortcomings;

2) Establishing linkages to the national strategic plan;

3) Improving documentation and monitoring efforts; and

4) Highlighting areas for “lessons learned” and capitalizing on prudent investment in capacity building.

This promotes a proactive attitude and positive signals to supporters and strategic allies for best professional and financial outcomes.

Both an internal and external assessment should be conducted to fully gauge the gaps and needs to enforce and effectively implement the protocols under the NIP to achieve the POPs Convention’s mandates. A SWOT analysis can internally determine an agency’s strengths and weaknesses which then could be the foundation for a transformation of these findings into opportunities and threats. Determining the weaknesses and converting them into threats can be interpreted as a program’s capacity gaps and needs.

A Capacity Needs Assessment is an external, intense evaluation to be administered by an independent party not only to determine the overall capacity gaps and needs, but provide recommendations to overcome these gaps and meets the needs.

#### 3.3.1.4 Criteria for evaluation and prioritization of options

1. A concentrated approach to this action plan is crucial and having a lawyer to focus on the issues of this action plan while assisting the respective state’s legal groups would be more effective as this work will be the individual’s only assigned task.The state and national lawyers would always still be involved with the drafting of laws and regulations and thus unable to entirely focus attention on the POPs work.

#### 3.3.1.5 Action plan implementation strategy

The strategy to be employed for this action plan is to secure technical assistance to complete a review of the existing legislation and regulations in the country and also examine relevant legislation and regulations in other Pacific island countries that have similar situations to the FSM. Following this review, the necessary new legislation will be drafted and submitted to the national and state legislative assemblies for action, while a public education effort is conducted to generate awareness of the POPs and other hazardous substance situation in the nation. New laws and regulations will be established with public hearings conducted to get input from the public. Finally, after the laws and regulation have been in effect for a year, a national workshop will be held to analyse the impact and make recommendations for needed changes.

**Table 10. Institutional and regulatory strengthening Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Updating legal support (legislation and regulations) for the POPs Action Plans implementation. | 1.1 Completing an inventory of all state and national laws regarding all aspects of the POPs life cycle: importation, storage, use, clean-up, and disposal. | National Government POPs Program Coordinator, NACPCM, state level EPA staff | Satisfactory progress in creation of national and state legislation inventory report, report reviewed by states, health survey conducted, submission to state and national legislatures. | June 2022 | Resource Needs (2022):  NG POPs Program Coordinator  EPA Office staff  Resource Needs (2023): $8,000 |
| 1.2 Reviewing the existing legislation inventory and provide comments regarding the laws currently in force by each state’s POPs program (e.g. if are outdated or still relevant and/or which issues still require new, or stronger, or more comprehensive legislation). | National Government POPs Program Coordinator, NACPCM, state level EPA staff | December 2022 |
| 1.3 Conducting a health survey in each state, to check if there are there poor health outcomes existing in the state which could be accountable to POPs exposure. | National Government POPs Program Coordinator, state level EPA staff, state and national Departments of Health | March 2023 |
| 1.4 Compiling a list of POPs related issues which require new or updated legislation for submission to the state and national governments for proper action. | National Government POPs Program Coordinator, NACPCM | December 2023 |
| **Objective #2**: Increasing and developing staff expertise, knowledge, and skills (by the provision of appropriate long-term postgraduate training methodologies). | 2.1 Establishing post-graduate training opportunities for eight students (one from each state to matriculate in 2022 and four more in 2023) at the College of COM-FSM and/or overseas colleges and universities in the field of environmental and health protection, chemicals and wastes management, or a related subject. The recruitment may take an additional year (2024) as qualified candidates are difficult to recruit. | National Government POPs Program Coordinator, NACPCM, national and state level Departments of Education and scholarship offices | Satisfactory progress in establishing scholarship opportunities, recruiting qualified students who meet admissions requirements, and identify an individual in each state to provide support to FSM students matriculating at overseas colleges and universities. | September 2022 | Resource Needs (2021):  NG POPs Program Coordinator  Resource Needs (2022):  NG POPs Program Coordinator  Department of Education staff  Resource Needs (2023):  NG POPs Program Coordinator  Department of Education staff  Resource Needs (2024):  NG POPs Program Coordinator  EPA Office or Department of Education staff |
| 2.2 Recruiting qualified High School graduates to apply for the scholarships noted in Activity #2.1 above and matriculate at appropriate post-secondary programs. | National Government POPs Program Coordinator, NACPCM, national and state level Departments of Education and scholarship offices | September 2022 |
| 2.3 Identifying an individual in each state to provide academic and personal support to FSM students studying at overseas academic institutions. The selected persons can be staff from a state EPA office or possibly staff at the state Department of Education. This individual’s responsibility is to maintain regular contact with the FSM student to support him or her as they undertake their tertiary studies abroad. | National Government POPs Program Coordinator, NACPCM, national and state level EPA offices and Departments of Education offices | September 2022 |
| **Objective #3**: Upgrading laboratory facilities and other infrastructure, as necessary, to enable the accurate identification and determination quantities of POPs and other hazardous materials found in the FSM. | 3.1 Establishing list of equipment and other materials necessary to expand the capabilities of these state EPA offices and other facilities to test for POPs and other hazardous substances. Testing of dirt samples is a key component of this work. | National Government POPs Program Coordinator, NACPCM, state level EPA staff | Satisfactory progress in identifying and procuring needed equipment, arranging preventive maintenance/calibration service contracts, and arranging for training sessions relative to the new equipment. | September 2021 | Resource Needs (2021):  NG POPs Program Coordinator  Resource Needs (2022): $40,000  Resource Needs (2023):  NG POPs Program Coordinator  Resource Needs (2024):  NG POPs Program Coordinator |
| 3.2 Procuring items identified in Activity #3.1 above. | National Government POPs Program Coordinator | March 2022 |
| 3.3 Arranging for preventive maintenance/calibration services contracts. This activity may require a consultant’s services. Coordinator). | National Government POPs Program | March 2022 |
| 3.4 As necessary, organizing training sessions related to use of the newly purchased equipment. | National Government POPs Program Coordinator, state level EPA staff | June 2022 |

### 3.3.2 Activity: Production, import and export, use, stockpiles, and wastes of Annex A POPs pesticides (Annex A, Part I chemicals)

#### 3.3.2.1 Context and analysis of issue

In the Federated States of Micronesia, the largest portion of the demand is for pesticides that are utilized in agriculture, and the insecticides that are used primarily for general household insects and other pests (often referred to as “structural pest control”). The overall demand for dangerous chemicals is relatively small.

Some potentially dangerous chemicals are also used prior to building construction to rid the proposed construction site ground area of termites and other destructive pests. Plant and structural pests are typically controlled by spraying with properly formulated pesticides, or manually applying these chemicals in powdered or other form. Most of the pesticides have residual effects, while some have direct kill actions, and some have both results.

Pesticides have occasionally been used for Public Health purposes. Following Typhoon Sudal in early 2004, Yap State Government conducted some spraying of pesticides for mosquito control. This one time activity was conducted in accordance with disaster management and EPA standards.

Government responsibility for the management of hazardous substances (including pesticides and insecticides) is shared between the national and state levels. At the FSM national level, the responsibility rests with FSM Department of Environment, Climate Change and Emergency Management (DECCEM), while at the state level the entities (EPAs and KIRMA) responsible for environmental protection are located in the executive branch, under the Office of the Governor. Both levels have responsibilities related to all aspects of chemical management, save production, since no chemicals are produced in the country. While some legislation to support these efforts exists regarding insecticides and pesticides, these entities have a broader mission that includes protection of the nation’s resident population and the environment from all hazardous contaminants.

Agricultural agents assist farmers to improve crop yields and may recommend the use of pesticides, insecticides, and/or fertilizers. These experts are thus involved in all aspects of the life cycle of agricultural chemicals and share some of the responsibility for pesticide management. These agencies serve to improve the production of locally grown food stuffs for local consumption and export. The goal of increasing locally grown production has dual benefits of providing additional nutrition to the diets of residents of the FSM, and also reducing the demand for imported expensive and typically less nutritious foods.

Since many of the FSM’s export products are in the agricultural sector, there is concern that any chemical used by the farmer be used correctly, so that no compromise is made adversely affecting the quality of the exported product. Thus, as stakeholders, the Economic Development Offices at the national and state levels have major interest that products not be contaminated.

Chemicals used as pesticides and/or insecticides are available in the FSM due to their importation by either certain government agencies (such as agricultural support programs), or commercial entities. A survey of stores throughout the country revealed that pesticides and other potentially hazardous substances (cleaning solvents, fertilizers, paints, etc.) that contain many different chemicals can be purchased by anyone. Most of these chemicals could be poisonous if misused, but the labels have warnings, and it is assumed to be the responsibility of the consumer to carefully follow the directions for use. A preliminary visual examination of the ingredient listings of various products available in hardware stores in each of the FSM states revealed no products that contained POPs, as per the information presented on the labels.

The vast majority of the pesticides and insecticides sold in the retail outlets in the country are imported from the US and have clearly visible warning labels and instructions in English. Some store clerks have the capacity to translate this information into the local languages as necessary. However, as more and more imported items arrive from Asian countries, a concern is that the labelling and warning messages will not be readable by store employees, and thus not easily translatable. The addition of the “uPOPs” items makes the problem more challenging by increasing the number of items to be identified.

All labelling and associated warning labels must be printed in a language that is understandable to the consumer, or at the very minimum an additional step should be included in the distribution process, which would provide written instructions in English, or in the language normally used at the point of distribution.

The potential for pesticide misuse always exists, and therefore dangerous chemicals must be controlled so that problems of resistance by pests and also inappropriate or excessive use of such substances is prevented. The application of certain ‘restricted use pesticides” (as determined by national regulations or state EPA offices) must be properly controlled and supervised, and people who are not instructed about the proper use of any pesticide must, at the very minimum, be made aware of the dangers of misuse.

Insect sprays that are obtained over-the-counter can be dangerous if misused. Contamination of uncovered raw or prepared food is one example of misuse. Misuse by children can be fatal. Consumer and community education is a clear need and it must be focused on proper and safe application: where to use, how to use, how much to use, how to store and dispose, and the dangers that can occur when pesticides and other chemicals are not used correctly.

The responsibility for providing directions for the use of pesticides and other dangerous substances (such as some fertilizers) that are distributed by government agricultural divisions rests with those government employees involved in the delivery of such products. These items are often purchased by the government in bulk quantities, but when distributed to the local farmer are repackaged into smaller amounts, and these repackaged quantities usually do not have warning labels included. Although most farmers may have previously received guidance on a particular product’s use, this may not be true in every case. Therefore, it is essential that employees in the agricultural divisions make certain that all recipients of pesticides or fertilizers from their offices be questioned as to their knowledge regarding proper use of the products, and if necessary, the correct information provided. Copies of label information, including directions for use and any warnings concerning misuse, should always be provided, in a locally understandable language, to everyone receiving the products.

While the consumer is assumed to be responsible for following the instructions-for-use labelling on items purchased at stores, it is still essential that employees selling the agricultural pesticides, fertilizers, or insecticides from their stores, question the buyer as to their knowledge regarding proper use of the products, and if necessary, provide the correct information.

The existing legal instruments which address the management of pesticides, insecticides, and other similar substances, consist primarily of laws from the Trust Territory (TT) period, and new FSM state and national laws often based on international classifications (and updates) of hazardous substances.

Two important regulations are:

* FSM Code, parts 1 to 16 under Title 25, (from TT regulations Subchapter IV [Trust territory Pesticides Regulations] of Chapter 13 [Air. Land and Water Pollution] of Title 63 [Public Health, Safety and Welfare]) which specifically addresses pesticide control, including importation, distribution, sale, use, and disposal, and contains a listing of “restricted use pesticides”; and
* FSM Code, parts 165 to 169 under Title 41 (from TT Code 15, September 1974) which lists banned and restricted chemicals.

Portions of these regulations have been adopted for use by the states and in some cases the states have created new regulations. Pohnpei state regulations closely follow the FSM Code. Other states have similar statues, and Yap State has regulations that do not specifically follow the FSM Code item by item, but still addresses all of the major points.

State regulations require that the importation of pesticides be registered, and in reality, one of major chemical management activities being done by the states at this time focuses on pesticide registration. Registration forms that collect information concerning the import and use of pesticides have been developed by each state. Since state level staff are responsible for efforts to protect the local environment and they possess the most extensive and accurate knowledge of the situation in their particular state, it is therefore reasonable for most of the monitoring and enforcement activities to be handled at the state level.

Concerning the comprehensive monitoring of chemical imports, including pesticides, this activity will require additional resources (primarily staffing) to check the contents of in-coming shipments. Without sufficient resources and support from the national level being devoted to the monitoring and enforcement activities, the effort will be weak. The situation has the same “balance” as many of the shared constitutional powers contained in the FSM’s statutes, implementation at the state level with technical assistance, standard setting, and external relationships handled at the national level.The permitting process requests pertinent information (including formulation, amount, active ingredients, and source) to be provided to the state EPA (or equivalent) offices. These offices are then required to keep a registry of the types of substances that are brought into each state.

These laws also contain regulations pertaining to the certification of “applicators”. An applicator is defined as the person who uses, or supervises the use of, restricted use pesticides. An applicator may be classified as “Commercial” or “Private” depending upon whether the use of the pesticide is on the applicators own property (Private Applicator) or if the pesticide application is a service being purchased by another party (Commercial Applicator).

The regulations state that private applicators are also required to be certified, however the standards are less stringent than those for a commercial applicator certification. Both classifications require that an application be submitted to their respective state EPA Office and an examination to be passed. The regulations also address the licensing of ‘restricted use pesticide’ dealers, delineating the records that must be maintained by dealers and commercial applicators.

Generally all pesticides are poisonous when absorbed in appreciable quantities into the body through inhalation, consumption, or direct contact. Staff of the state agriculture offices and health departments report very few health problems attributed to pesticide use. If pesticide exposure should become a health issue in the future, then investigation of the causes must be undertaken, and a stronger effort to disseminate relevant information on safe pest management concepts should be launched. If the use of banned or restricted chemicals is discovered, then more stringent import inspections methods must be considered.

Other potential problems are long term storage sites, disposal sites, and areas where applications of pesticides (and fertilizers) have occurred over a considerable length of time, possibly contaminating the soil and nearby waters. The potential exists for pollution of inland waterways from the misuse of pesticides in certain locations on the high islands in the country. Marine pollution is also a concern, and the problem potentially could affect any island in the nation, both high and low. Run off, as a source of pollution, can contain pesticides, as well as many other substances destructive to fragile marine ecologies.

On the country’s low-islands, the fresh water lens, upon which an atoll’s agricultural efforts depend, is also susceptible to contamination by pesticides. Control of the problem is possible by altering the human activities that cause such pollution, by strict adherence to appropriate pesticide handling, storage, and disposal procedures. Data on these problems is insufficient, unknown chemicals may be involved, and in the past the focus of attention has typically been on damage to atoll taro patches by seawater. If the utilization of additional pesticides occurs in atoll agriculture, the knowledge of proper application methods, with consideration given to the special characteristics of atoll environments, must be provided beforehand.

There is a need to improve the collection and maintenance of data regarding pesticides. Specific to each state, many of the statistical yearbook types of data collections may provide some generic information on chemicals or products imported, but usually do not provide details on which specific (including restricted or banned) substances are included in the totals. Agriculture offices will have some information on the types of pesticides, insecticides, and fertilizers which they import and/or distribute. As mentioned, the EPA (or equivalent) office in each state is involved with registration of pesticides, and thus these state offices are the organizations most likely to have some long-term institutional knowledge of chemical management issues in each state. These offices are one of the most logical sources for technical assistance to improve the availability of quality pesticide information.

The Pesticide registration system guide created by FAO/WHO in 2010 is a resource that can be tapped to assist in the development of an improved registration system for the FSM The pesticide registration tool kit resources includes a code of conduct and utilizes a whole pesticide life-cycle approach,

#### 3.3.2.2 Goals and objectives

The safe management, on all islands in the country, of all aspects of pesticide and insecticide use (from importation through to disposal) is the overall goal for this action plan. This includes all aspects in the ‘local life’ of these substances: import, marketing and distribution, storage, use, discard by the consumer/applicator, and final disposal.

FSM Action Plan 3.3.12, which deals with the management of hazard wastes and contaminated sites includes, under its first objective, the creation of a National Advisory Committee for POPs Chemical Management (NACPCM) in the FSM. The NACPCM will be the entity which provides national level oversight to the various POPs activities to take place under the project. As such, the group will provide support and coordination to the activities to address pesticide management, as well.

In addition to the related objectives in the other FSM Action Plans, there are three specific objectives listed in this plan to achieve the goal of safe pesticide management:

1. To create, by the end of 2021, a program that will increase the understanding of the general population, and also the knowledge of specifically targeted sub-groups (such as individuals in the agricultural and construction sectors), concerning the proper handling and use of all pesticides available in the FSM, and the potential hazardous consequences of pesticide misuse. This information will include all relevant aspects of pesticide management, from procurement to disposal.
2. To improve, by the end of 2022, the capacity of the appropriate offices (at both the national and state level) and commercial entities, to successfully implement safe management of all aspects of the use of pesticides in the country (including importation, marketing and distribution, storage, application, discard, and disposal).
3. To improve, by the end of 2022, the capacity of the four state EPA Offices to collect and maintain data regarding the registration and inventory of pesticides in the FSM.

#### 3.3.2.3 Relevant management options

The most important aspect is making certain that individuals involved with the agricultural and construction sectors in the FSM understand the benefits of the proper use of pesticides and the negative consequences of pesticide misuse. In conjunction with the task of increasing pesticide knowledge among the general population, it is a relatively straightforward effort with few alternatives to be considered. Possible options would include hiring a consultant, adjusting the schedule of activities, changing the methods employed to disperse appropriate, up-to-date, and accurate information to the population (and to certain subgroups thereof), and of utilizing private sector or non-government organization expertise to conduct parts of the information “campaign”.

The on-going financial support for the operation of the FSM’s National Advisory Committee for the POPs Chemical Management (NACPCM) is included in FSM Action Plan 3.3.12. The NACPCM will serve as a source of available in-country expertise, and facilitate the provision of relevant and accurate information to the nation’s leadership regarding all activities relating to the proper management of pesticides and related substances. This group is responsible to monitor and evaluate the progress and effectiveness of the various POPs activities and subsequently to direct adjustments and changes as recommended by this expert group to the National POPs Program Coordinator.

#### 3.3.2.4 Criteria for evaluation and prioritization of options

A consultant with expertise in the area of pesticides may be needed to assist the FSM National Government’s Environmental Office and the four state Environmental Protection Offices (or equivalent) with developing a community awareness up-scaling program. However, given the expertise that is available in-country, and the resources available via the Internet, it is anticipated that the need for a consultant may be minimal. Further, it is expected that the consultant recruited to assist with other FSM Action Plans (specifically 3.3.12 which addresses Hazardous Wastes and Contaminated Sites, and 3.3.14 which addresses Public Awareness issues), can provide assistance with regard to the pesticide aspects of those activities.

The scheduling of the activities for this Action Plan may be adjusted. As much of the pesticide oriented awareness activities will be conducted as a subset of the overall Public Awareness Action Plan (3.3.14), a similar time frame for the development and implementation of the pesticide related activities will be followed.

The identification of all of the various pesticides and insecticides in use or storage in the FSM should be the top priority in this plan, as the urgency of these activities often depends upon the nature of the substances being used. The inventory work is to be completed under Objective #2 of Action Plan 3.3.12. If it is discovered that POPs or other hazardous substances are indeed in the pesticides being used in-country, then efforts must begin quickly to address the situation and minimize any on-going or potentially new human and/or environmental exposures.

Determination of the content and the methods of presentation to be employed to increase public awareness can follow the objectives outlined in FSM Action Plan #3 (Public Education and Awareness). The presentations to the general public developed by the Hazardous Waste Awareness Program Working Group (HWAPWG) in that plan will include general pesticide management information. The specific sub-groups to be targeted for a more technically expanded presentation will be identified and the HWAPWG guide the development of the presentations for those particular sub-groups, which is included in this action plan.

As indicated in Objective #2 above, the effort to provide training to appropriate government and private sectors employees, and other appropriate persons at the state and national level, concerning the marketing and distribution, storage, application, discard, and disposal of pesticides and similar items will be developed under this Action Plan.

Efforts to improve the collection and management of pesticide data (accuracy, comprehensiveness, and timeliness) will be included under this Action Plan with respect to the registration work of the EPA Offices.

#### 3.3.2.5 Action plan implementation strategy

FSM National Government’s Department of Environment, Climate Change and Emergency Management and the four state Environmental Protection Agency Offices (or equivalent) will coordinate the activities aimed at safe management of pesticides and similar substances. A consultant with knowledge regarding pesticides may be necessary, but it is anticipated that external expertise included in other Action Plans can be utilized. If in-country expertise is not available, the DECCEM office will be responsible for arranging the technical assistance, as necessary.

The responsibilities of the four state Environmental Protection Offices (or equivalent) will include the actual state-wide survey to identify existing supplies of pesticides as included under Action Plan #1. These stockpiles may be government stockpiles, or imported commercial items waiting for wholesale or retail sale.

Determination of the hazardous status of any such items and disposal decisions would be included in Action Plan 3.3.12.

The work plan to address each of the numbered objectives above is as follows.

**Table 11. POPs pesticides management Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Creating, by the end of 2021, implement beginning in January 2022, and once a year thereafter, a public awareness program that will increase the understanding of the general population, and also the knowledge of specifically targeted sub-groups (such the agricultural and construction sectors), concerning proper handling and use of all pesticides available in the FSM, and the potential hazardous consequences of pesticide misuse. This information will include all aspects of pesticide management, from procurement to disposal. | 1.1 Identifying the specific sub-groups to be targeted for a more technically expanded presentation on pesticide issues. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager, in consultation with HWAPWG | Satisfactory progress in identification sub-groups to be targeted, compilation of reference materials list, development of presentation materials for targeted sub-groups, review of presentation materials at national workshop, presentations performed | March 2021 | Resource Needs (2021): $5,000  Resource Needs (2022, 2023, 2024): $24,000 |
| 1.2 Compiling a list of reference materials as sources of accurate and current information for developing guidance protocols about the pesticides in use in the FSM. | National Government POPs Program Co-ordinator and State POPs Public Awareness Program Manager, in con-sultation with HWAPWG | April 2021 |
| 1.3 Creating a list of pesticide-related topics to be included in the presentation, determine methods of knowledge transfer (pamphlets, workshops, etc.) and develop presentation materials for each topic to be used for targeted sub-groups. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager, in consultation with HWAPWG | July 2021 |
| 1.4 Including review of targeted sub-group presentations (developed in Activity 1.3 above) in the agenda of the national level workshop scheduled in Activity 4.3 of Action Plan 3.3.14. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager | November 2021 |
| 1.5 Performing the prepared presentations in each state once per year. | State POPs Information Officer and EPA staff | First presentation by June 2022 and then on-going in 2023 and 2024 |
| **Objective #2**: Improving, by the end of 2022, the capacity of the appropriate offices (at both the national and state level) and commercial entities, to successfully implement safe management of all aspects of the use of pesticides in the country (including importation, marketing and distribution, storage, application, discard, and disposal). | 2.1 Conducting needs analysis, at the national Environment Office and state EPA Offices, of the focus, types, and content of training needed to improve the ability of both human resource and office operational systems (national level government, state level government, and private sector) to put in force safe management practices for all aspects of pesticide use. | NACPCM, National Government POPs Program Coordinator and State EPA Offices | Satisfactory progress in identifying training needs, arranging and im-plementing training activities as scheduled, conducting workshop | January 2022 | Resource Needs (2022): $16,000  Resource Needs (2023, 2024): $96,000 |
| 2.2 Conducting a national level workshop to discuss the findings of Activity 2.1 and determine what approaches must be utilized and specific groups targeted, to improve safety with regard to pesticides in each of the areas: importation, marketing and distribution, storage, application, discard, and disposal. | NACPCM, National Government POPs Pro-gram Coordinator and State EPA Offices | May 2022 |
| 2.3 Determining appropriate HR training methods and/or venues (ex: long-term college based, attachments, short term seminars/workshops, on-the-job training) for the identified training area needs | NACPCM, National Government POPs Program Coordinator and State EPA Offices | March 2022 |
| 2.4 Utilizing the information gathered in activities 2.2 and 2.3 above, identify, contact, and arrange currently available in-country training options, and subsequently identify, contact and arrange for out-of-country training options. | NACPCM, National Government POPs Program Coordinator | August 2022 |
| 2.5 Implementing training activities as organized - conducting one training per state per year with the following participants: state EPA and agriculture office staff, retail hardware stores, and commercial farming businesses. | NACPCM, National Government POPs Pro-gram Coordinator and State EPA Offices | August 2023 and 2024 |
| **Objective #3**: Improving, by the end of 2022, the capacity of the state EPA Offices (or equivalent) to collect and maintain data regarding the registration and inventory of pesticides in the FSM. | 3.1 Updating existing pesticide data collection procedures in order to improve efficiency in the gathering of better quality information. The data should be related to all aspects of the ‘local life’ of these substances: import, marketing and distribution, storage, use, discard by the consumer/applicator, and final disposal. | NACPCM, National Government POPs Program Coordinator, State EPA Offices | Satisfactory (as scheduled) progress in developing new data collection procedures, identifying state level staff to handle pesticide data work, procurement of computer equipment, new procedures implemented, pesticide databases updated | September 2022 | Resource Needs (2022): $28,000  Resource Needs (2023, 2024): $16,000 |
| 3.2 Identifying and procuring needed computer equipment, database software, and related supplies for each state (e.g. Pesticides Stockpiles Management System (PSMS) of FAO). | National Government POPs Program Coordinator, in consultation with State EPA Offices | April 2022 |
| 3.3 Identifying staff in each state EPA Office to be responsible for pesticide data collection and database input/maintenance related work. | State EPA Offices | September 2022 |
| 3.4 Implementing new data collection procedures and update pesticide databases in each state. | National Government POPs Program Coordinator, State EPA Offices | 31 October 2022 and on-going thereafter |
|  | 3.5 Implementing an empty pesticides containers management system | National Government POPs Program Coordinator, State EPA Offices, Vendors | System is collecting containers | 31 October 2022 and on-going thereafter | No additional needed, vendor suppolied |

### 3.3.3 Activity: Production, import and export, use, identification, labelling, removal, storage, and disposal of PCBs/PCNs/SCCPs/HCBD and equipment containing PCBs/PCNs/HCBD (Annex A, Part I and II chemicals)

#### 3.3.3.1 Context and analysis of issue

The first POPs inventory in the Federated States of Micronesia, discovered items of electrical equipment which were brought to the islands and installed in the decades following WWII, at a time when the utility infrastructure was first being constructed on the islands. State centers were first with hospitals, schools, and government buildings. Then, in subsequent years, the development expanded into adjacent communities and some of the larger outer islands.

Polychlorinated Biphenyls (PCBs) have been discovered in items imported during this period of infrastructure development. The hazardous properties of PCBs were not yet known until years later. PCBs are typically in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, sealants and plastics. Information collected during an assessment conducted in 1998 identified that, in the FSM, the electrical equipment containing PCBs are primarily the transformers which are positioned on utility poles or have been removed and are stored at specific locations in each state. These transformers were installed in each of the FSM states during the Trust Territory period. There is also a slight possibility that PCBs may be found in other items in the country, such as fluorescent light fixtures in older buildings constructed in the 1960’s, ‘70’s and early ‘80’s.

During the years following the first POPs program in the FSM, transportation was arranged to remove all of the PCB containing items on islands in the western Pacific. The possibility, although small, still exists that there remain some PCB containing items in the FSM. Since the state personnel in each of the four states now have the capacity to test for PCB’s in transformers, an effort is necessary to re-visit PCB sites, and re-test. The availability of test kits and the necessary tools and protective gear for testing this work may need to be procured.

During the removal of PCB Contaminated transformers, it was discovered that, due to the lack of replacement transformers in some states, not all of the units identified as containing PCB’s had been removed from service. Removal would occur as the replacement transformers become available. The present POPs update activity would be a good opportunity to work with the entities which are responsible for the generation and distribution of electrical power in each of the four FSM states, and validate that all PCBs are gone. The state POPs Task Forces will work cooperatively with the utility company to complete this PCB containing item removal.

Since the main uses of SCCPs correspond to many former open applications of polychlorinated biphenyls (PCBs) and polychlorinated naphthalenes (PCNs), the action plan of PCBs should be linked or combined with the action plans of PCNs and SCCPs in open application.

SCCPs have been used to replace polychlorinated biphenyls (PCBs) and polychlorinated naphthalenes (PCNs) in a wide range of open applications (e.g. cables, sealants, paints). However, SCCPs have been reported to not be suitable for uses requiring high heat stability (e.g., capacitors, transformers).

HCBD has been used in transformer fluids. Due to the long service life of transformers, HCBD used in this application even from the 1970s or 1980s might still be present in operating transformers and out of use transformers.

The amount of HCBD in transformer oils was considerably smaller than PCBs and the total amount used in this application is unknown. There has been no report of transformers containing HCBD in the framework of the Stockholm Convention inventories or other studies until now. The amount of transformers containing HCBD can be considered small.

Most of the assessments of transformer oils for PCBs have been conducted using test kits which measure the total amount of chlorine in the oil such as Chlor-N-Oil or Dexsil test. Within those assessments, HCBD containing transformers are tested positive through the same mechanism as PCBs and could be managed accordingly. Capacitors and transformers potentially containing HCBD may be tested for organochlorine using the test kits for PCBs. The chlorine detected could stem from PCBs, HCBD or PCNs. HCBD-containing condensers/transformers could be identified within the monitoring of capacitors or transformers for PCBs using GC-ECD.

The PCNs uses include industrial and consumer applications in closed and open applications. PCNs were often used for the same applications as PCBs because of their structural similarity.

#### 3.3.3.2 Goals and objectives

The overall goal for this action plan is the complete and verified removal of all PCB/PCNs/SCCPs/HCBD’s from the islands of the Federated States of Micronesia. There are three specific objectives listed in this Action Plan to reach this goal:

1. To complete, by the end of 2022, a comprehensive inventory of any remaining PCB/PCNs/SCCPs/HCBD’s in the country, including contaminated items used by the electric power generating or distribution system, and any other contaminated items or materials.
2. To collect and transport, by the end of 2023, all identified PCB/PCNs/SCCPs/HCBD containing items to the storage facilities and prepare them for off-island disposal. Power authorities must remove PCB/PCNs/HCBD contaminated equipment from service in compliance with this schedule, and allow sufficient time to prepare items for off-island transport.
3. To complete, by 2024, a final clean-up of any remaining PCB contaminated sites.

Objectives #1, #3, #5, and #7, covered in Action Plan 3.3.12, will also include PCB/PCNs/SCCPs/HCBD contaminated items and materials.

The creation and on-going support for the FSM’s National Advisory Committee for POPs Chemical Management (NACPCM) is included in FSM Action Plan 3.3.12, which focuses on activities needed for Hazardous Waste Storage, Disposal, and Contaminated Site Clean-up. The NACPCM will serve as a source of the available in-country expertise and facilitate the provision of relevant and accurate information to the nation’s leadership regarding the development of legislation addressing all aspects of PCB and other hazardous substances management, including identification, collection, storage, and disposal.

The construction, in each FSM state, of an appropriate storage facility for PCB containing items is also included in FSM Action Plan 3.3.12. The information collected in the inventories of PCB and other hazardous substances will provide guidance to the necessary design specifications for each facility. Volume and length of time until off-island removal are also factors to be considered.

The off-island disposal of PCB/PCN/SCCP/HCBD contaminated materials will be completed in conjunction with the removal of other POPs and hazardous wastes by the end of 2024. The Action Plan 3.3.12 budget includes the financial resources necessary for the costs associated with the export of these materials.

#### 3.3.3.3 Relevant management options

This action plan, targeting the phase out of the remaining PCB/PCN/HCBD containing transformers and other PCB/PCN/SCCP/HCBD containing items in the FSM, is a straightforward effort with few alternatives to be considered. Possible options would include hiring a consultant, adjusting the schedule of activities, increasing the number of storage facilities, and utilizing private sector expertise to conduct the collection and transport of PCB containing items to the storage facilities, as well as final disposal. Since there have been previous PCB removal efforts, and manufacture of the substance was banned in the US in 1977, it is not anticipated that many PCB-containing items will be identified at this time.

#### 3.3.3.4 Criteria for evaluation and prioritization of options

The four state Environmental Protection Agencies (or equivalent) with assistance from the national level will identify, other than the known PCB containing transformers, other items that may contain PCB’s. This information will be used to create a list of items that may be present in the FSM, and thus, facilitate the search effort.

The identification and collection of PCB/PCN/HCBD/SCCPs containing items, if any at the storage facilities, should be completed as soon as possible. The storage facilities must be monitored to prevent any possible containment problems, and arrangements for removal to off-island disposal facilities should be completed without undue delay.

It is not expected that large storage facilities will be necessary for PCB items. Contaminated transformers can be shed stored out of the rain, but it may be better not to move them more than once. Condition, location, and possibility of exposure are considerations in this situation.

PCB/PCN/HCBD/SCCPs containing items may be found on other islands where electric power is generated, or older buildings still stand. The cost and danger of transporting these items must be balanced against the cost of an additional storage facility and the ability of the ship. Provided that the PCB containing items can be safely packaged, it is envisioned that the state field trip ships will be able to transport the items to the storage facilities in the state centers. These activities will be coordinated with the parallel activities in Action Plan 3.3.12.

#### 3.3.3.5 Action plan implementation strategy

The coordination of this final PCB’s removal will involve the FSM DECCEM, the four state Environmental Protection Agencies (or equivalent), and for activities involving the PCB/PCN/HCBD containing transformers, the entities which are responsible for the generation and distribution of electrical power.

Many of the activities involved in this action plan should be carefully coordinated with the parallel activities included in Action Plan 3.3.12 - Hazardous Waste Storage, Disposal, and Contaminated Site Clean-up.Based upon the successful completion of the work under the initial NIP, the removal of PCB containing transformers from an active electric power grid should no longer be necessary, as none are there

The responsibilities of the four state Environmental Protection Agencies (or equivalent) will include the actual state-wide survey to identify any remaining PCB/PCN/HCBD/SCCPs containing items, the collection of all PCB/PCN/HCBD/SCCPs containing items at the storage facilities, and the proper packaging of these items for removal/final disposal. States will also need to conduct the final clean-up activities as needed.

Following the first POPs project, the entities which provide the generation and distribution of electrical power in each state was required to remove any remaining PCB/PCN/HCBD containing transformer units from service. Should there still be a PCB/PCN/HCBD containing transformer in service, the directives that were included in the first POPs Action-Plan should be enforced.

The work plan containing each of the numbered objectives above is as follows.

**Table 12. PCBs/PCNs/HCBD/SCCPs management Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Completing comprehensive inventory of any remaining PCB/PCN/HCBD/SCCP’s in the country. | 1.1 Creating a list all potential items in the FSM that may still contain PCB/PCN/HCBD/SCCP’s. | National Government POPs Program Coordinator | Satisfactory progress in identification of any remaining PCB containing items as evidenced by creation of “Potentials List” and “Identification/Location Log” and reported quarterly from state Environmental Protection Agencies to National Government POPs Program Coordinator. | January to March 2022 | Resources Needs (2022): $22,000 |
| 1.2 Physically locating items identified on the list and inventory by classifying as “non PCB/PCN/HCBD” or a “PCB/PCN/HCBD containing article” by item identification or test for PCB/PCN/HCBD’s. Create and maintain database log with description of each PCB/PCN/HCBD containing item and exact location. | Staff of each state Environmental Protection Office | December 2022 |
| 1.3 Assessing the past use of PCBs/PCNs and current/past use of SCCP in open applications (e.g. sealants, paints, rubber, chloroprene, plastic additive, industrial oils) in the country and, where relevant, developing inventory of PCBs/PCNs and SCCPs in open applications. | Staff of each state Environmental Protection Office | January to December 2023 |
| 1.4 Inventorying of potentially PCB/PCN and SCCP contaminated waste oils and assessing the risk of (waste) oils for food, feed and human health. | Staff of each state Environmental Protection Office04 | January to December 2023 |
| 1.5 Developing and regularly updating a database for PCB/PCN containing equipment (in use and storage) and open applications (e.g. buildings/constructions). | Staff of each State Environmental Protection Office |  | January to December 2023 |
| **Objective #2**: Collecting and transporting all identified PCB/PCN/HCBD containing items to the storage facilities and prepare them for off-island disposal. | 2.1 In collaboration with the electrical power authority in each state, conducting an assessment of all PCB/PCN/HCBD contaminated transformers (and any other equipment) and establish schedule for removal from service (if necessary), and collection. | Staff of each state Environmental Protection Office | Satisfactory progress in transport of PCB containing items as evidenced by arrival at storage facilities, and packing of items, as reported quarterly from state Environmental Protection Agencies to National Government Pop’s Program Coordinator. | January to December 2023 | Resources Needs (2023): $28,000 |
| 2.2 Arranging for appropriate state vehicles/boats/ship (and necessary POL) to transport items included on each state’s “Identification/Location Log” to the assigned storage facility. If the facility is not yet ready, a secure temporary facility which will keep exposure to a minimum will need to be used. | Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary | January to December 2023 |
| 2.3 Scheduling collection activities per availability of vehicles and boats/ships | Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary | January to December 2024 as necessary. Other action plans also have such transportation activities included |
| 2.4 At each storage facility, packaging items as necessary for removal to out-of-country disposal sites. Facilitating off island shipment for disposal will be arranged by DECEM. | Staff of each state Environmental Protection Office | January to December 2024 |
| **Objective #3**: Completing a final clean-up of any remaining PCB/PCN/HCBD/SCCP contaminated material at sites. | 3.1 Cleaning-up and decontaminating the storage facilities and any other PCB/PCN/HCBD/SCCP contaminated sites not addressed in Action Plan 3.3.12. (Costs will vary depending on the size of each facility and number of contaminated site locations, but are estimated to be less than an average of $10,000 per state.) | Staff of each state Environmental Protection Office | No evidence of PCB’s at storage facilities or identified sites. | January to June 2024 | Resources Needs (2024): $40,000 |
| **Objective #4:** Raising awareness, providing education and training of stakeholders (policy makers; customs, related industries, NGOs and the public) on PCBs/PCNs in closed and open applications. | 4.1 Awareness/education of policy makers and other stakeholders on health, environment and food hazards of PCBs, PCNs and SCCP. | Staff of each state Environmental Protection Office | Awareness is raised, education is provided and training is delivered to stakeholders (policy makers; customs, related industries, NGOs and the public) on PCBs/PCNs in closed and open applications | January to December 2024 | Included in other Action Plan budgets |
| 4.2 Providing capacity building for strengthening the inspection capacity for customs and other competent authority (in use; sales, storage, disposal). | National Government POPs Program Coordinator | January to December 2024 |
| 4.3 Training of staff on monitoring and analysis of PCBs and PCNs for closed and open applications. | Staff of each state Environmental Protection Office | January to December 2024 |
| 4.4 Education of utility sector, maintenance workers and industry possessing capacitors, transformers, and other PCB/PCN containing closed equipment and open applications on PCBs, PCNs and alternatives. | National Government POPs Program Coordinator | January to December 2024 |

### 3.3.4 Activity: Production, import and export, use, stockpiles, and wastes of hexaBDE and heptaBDE (Annex A, Part IV chemicals) and tetraBDE and pentaBDE (Annex A, Part V chemicals) (and HBB, where applicable (Annex A, Part I chemicals))

#### 3.3.4.1 Context and analysis of issue

In order to update the current national implementation plan (NIP), a preliminary inventory of commercial PentaBDE, commercial OctaBDE and commercial DecaBDE, their current use, initial flow, and disposal have been conducted in the FSM based on the PBDE inventory guidance documents.

PBDEs are brominated flame retardants (BFRs) used in various products such as plastic in electronics, polyurethane foams in vehicles and, textiles, to reduce their ignitability to meet certain flammability standards. Due to the increase of flammable polymer materials, the global demand for PBDEs (and other flame retardants) has been growing rapidly from the 1970s to 1990s. Three commercial PBDE mixtures were produced and used in the market: commercial PentaBDE, OctaBDE and DecaBDE. However, due to their characteristics of persistence, bioaccumulation potential, long-range environmental transport and adverse effects on wildlife and humans, PBDEs have become ubiquitous environmental contaminants and aroused increasing concern. Appreciable levels of PBDEs have been reported in various environmental media and biota, including air, soil, marine mammals and human blood.

Due to the environmental and health risk, commercial PentaBDE (c-PentaBDE) and commercial OctaBDE (c-OctaBDE) technical mixtures production stopped in 2004. Plastics are important parts of electrical and electronic equipment (EEE) products and PBDEs are widely used as additives in these plastics.

The challenge is how to practically control PBDE in articles and the recycling flows. This is a problem for developing countries like the FSM where state of the art recycling plants with monitoring/separation capacity do not exist and measurement capacity is not established. The FSM lack appropriate recycling and destruction facilities which leads to open burning or dumping of such hazardous wastes or release to water bodies causing environmental pollution including marine litter.

#### 3.3.4.2 Goals and objectives

The action plan focuses on setting actions and measures whose implementation will lead to managing and controlling POP-PBDEs containing products.

#### 3.3.4.3 Relevant management options

For managing PBDEs, the life cycle management (import, export, use, recycling, destruction) of POPs containing articles/products and waste needs to be developed, in particular for EEE/WEEE and vehicles and end of life vehicles. In addition, HBCD and to a less extend PBDEs are used in insulation of housings (polyurethane and polystyrene).

#### 3.3.4.4 Criteria for evaluation and prioritization of options

The main criteria used when evaluating the POP-PBDEs in the FSM and prioritizing the management options in the country was represented by the major uses of POP-PBDEs within different sectors. In case of EEE the largest use share of POP-PBDEs was in Cathode Ray Tube (CRT) TVs and monitors, with DecaBDE considerable higher use percentage compared to OctaBDE. When it comes to transport sector, POP-PBDEs where used in vehicles (textiles and PUR foams). It had also uses in insulation materials due to its anti-flammability properties.

#### 3.3.4.5 Action plan implementation strategy

This chemical was added to the POPs list in May 2009. According to the available data, production and use of hexabromobiphenyl has ceased in most, if not all, countries. However, it is possible that hexabromobiphenyl is still being produced in some countries.

The industrial processes which create this dangerous by-product do not exist in the FSM, and there is no reason for this chemical to be imported. It is not expected that this substance would be found in the FSM other than in items manufactured prior to 2009 and then imported into the nation. Other than as a element used in out-date computer equipment and imported vehicles from Japan, it is extremely unlikely that any instances of these chemicals exist in the FSM. At this time the FSM Customs and Tax Administration office has no recorded import information available on this substance. Research by those involved in the POPs program will be necessary to identify if any of the imported computers or vehicles contain such substances. Customs and Tax inspectors and EPA staff might need to receive training based upon the information discovered during the research effort.

**Table 13. POP-PBDEs management Action Plan**

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| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**:  Environmental sound management of POP-PBDEs and HBCD in the FSM  Building/strengthening regulatory and institutional framework for POP-PBDEs and HBCD management in the FSM  Note: This objective includes activities that may not be necessary if none of the suspected substances are found in the FSM | 1.1 Conduct research to determine if any importation, manufacture, reuse, recycling, and export (except export for environmentally sound waste management) of POP-PBDEs and HBCD. Arrange training as necessary. | National Government POPs Program Coordinator. | Regulatory and institutional framework for POP-PBDEs and HBCD management in the FSM is build/strengthened through relevant research  Conduct training for Customs and EPA staff (if needed).  Directory created and maintained up-to-date  Registration protocols established (if necessary). | March 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Training costs will be minimal as the activity can be conducted on-line. |
| 1.2 Create national restrictions on the importation of vehicles and electrical and electronic products manufactured prior to 2009 as these may contain elevated concentrations of POP-PBDEs and HBCD. | FSM Attorney General’s Office to create restriction regulations.  National Government POPs Program Coordinator to organize trainings, as necessary.  State Environmental Protection Office staff. | October 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for AG Office work. |
| 1.3 Developing and maintaining a directory of regional and international facilities with the capability for environmentally sound disposal of POP-PBDEs and HBCD containing materials/articles. | National Government POPs Program Coordinator. | December 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 1.4 Developing strategies for the registration of electronic devices, vehicles, and materials, including wastes containing POP-PBDEs, as well as insulation materials containing HBCD, entering in the FSM. | National Government POPs Program Coordinator | March 2023 (if necessary) | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for AG Office work. |
| **Objective #2**:  Enhancing the capacity building for POP-PBDEs and HBCD management | 2.1 Provide training to state and national staff (as needed). Training Customs and Tax staff, EPA staff, and waste management workers on environmentally sound management of POP-PBDEs and HBCD wastes. | National Government POPs Program Coordinator  Training can be conducted on-line, as one or possibly three separate activities. See note in column 1. | Capacity building for POP-PBDEs and HBCD management is enhanced | June 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 2.2 Training Customs Officers on the detection of articles containing POP-PBDEs and HBCD and on checking exports for compliance with the Basel (and Waigani) Conventions. | National Government POPs Program Coordinator  Training can be conducted on-line, as one or possibly three separate activities. See note in column 1. | July 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 2.3 Building knowledge and capacity for management of POP-PBDEs and HBCD impacted materials and waste categories, including improved co-ordination in national data collection initiatives. | National Government POPs Program Coordinator  Training can be conducted on-line, as one or possibly three separate activities. See note in column 1. | August 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
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| **Objective #3**: Raising awareness on POP-PBDEs and HBCD related matters | 3.1 Conducting public awareness on POP-PBDEs and HBCD health impacts (from e-waste, used motor vehicle and construction and demolition waste mismanagement). | National Government POPs Program Coordinator. See note in column 1 | Awareness on POP-PBDEs and HBCD related matters is raised  Awareness on POP-PBDEs and HBCD related matters is raised | September 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 3.2 Raising awareness of relevant stakeholders (policy makers, authorities, industry, recyclers, and public) on POP-PBDEs and HBCD containing products/articles/wastes management and disposal practices. | National Government POPs Program Coordinator  National Government POPs Program Coordinator | September 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |

### 3.3.5 Activity: Production, import and export, use, stockpiles, and wastes of HCBD (Annex A, Part I chemicals) if used in the country

Information included under section 3.3.3.

### 3.3.6 Activity: Production, import and export, use, stockpiles, and wastes of SCCPs (Annex A, Part I chemicals) if used in the country

Information included under section 3.3.3.

### 3.3.7 Activity: Production, import and export, use, stockpiles, and wastes of PCNs (Annex A, Part I chemicals) if used in the country

Information included under section 3.3.3.

### 3.3.8 Activity: Production, import and export, use, stockpiles, and wastes of DDT (Annex B, Part II chemicals) if used in the country

DDT has been widely used worldwide for decades, to control disease (especially mosquito-borne disease) and was also sprayed extensively on many agricultural crops. DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. After the war, DDT continued to be used to control disease, and it was sprayed on a variety of agricultural crops, especially cotton. DDT continues to be applied against mosquitoes in several countries to control malaria. Although no records exist, the chemical was most likely used to control the spread of dengue fever and perhaps typhus. Its stability, its persistence, and its widespread use have meant that DDT residues can be found everywhere including the FSM, where it has most recently been used to control dengue and other newly identified dengue like mosquito-borne diseases such as Zika and Chikungunya.

DDT has been used in the past in the FSM for disease vector (mosquito) control but little data concerning when, amounts used, or duration of use, is available. As a POPs listed chemical, DDT use in the FSM is banned as of the date on which the Stockholm Convention went into effect. Other, less dangerous, alternatives are in use for vector control. Mosquito borne diseases are not a major health problem in the FSM, but rather should be considered a “recurring” public health problem, appearing every five to ten years. Thus DDT use has been limited to very specific occasions, such as following major typhoon or flooding to prevent mosquito breeding

The short-term acute effects on humans are limited, but long-term exposures have been associated with chronic health effects. DDT has been detected in breast milk, raising serious concerns about infant health. No DDT contaminated foodstuffs have been identified, and no disease cases in the FSM have ever been identified with DDT as a source of exposure.

A small quantity of a DDT containing substance was removed from Pohnpei by the SPREP team following the first POPs in PICS project about 15 years ago. Thus, further DDT action plan development for the FSM is not deemed necessary.

### 3.3.9 Activity: Production, import and export, use, stockpiles, and wastes of PFOS, its salts and PFOSF (Annex B, Part III chemicals)

#### 3.3.9.1 Context and analysis of issue

Perfluorooctanesulfonate (PFOS) is one of the most toxic PFAS. PFOS and their salts have been produced since 1950s. PFOS and precursors of PFOS (PFOS related substances) were listed in 2009 in Annex B with a range of specific exemptions and acceptable purposes. Historically the major global manufacturer was the American 3M Company, which in 2003 3M voluntary stopped the sales of PFOS. At around the same time production started in China at lower production volumes of ca. 200 t/year.

Furthermore perfluorooctanoic acid (PFOA) was listed as POPs in May 2019 with a range of exemptions. Additionally, perfluorohexanesulfonic acid (PFHxS) is currently assess by the POPRC and it has been concluded that it meets the POPs properties. Other PFAS are not listed in the Stockholm Convention but are considered an issue of concern under SAICM.

Although the main global producing companies like 3M phased out production since 2003 but still some other companies are producing PFOS. The current remaining major uses of PFOS are aqueous film forming foams (AFFFs), plating industry, insecticides (sulfluramide) and oil drilling.

#### 3.3.9.2 Goals and objectives

The action plan focuses on setting actions and measures whose implementation will lead to managing and controlling PFOS, its salts and PFOSF containing products.

#### 3.3.9.3 Relevant management options

For managing PFOS, its salts and PFOSF, the life cycle management (import, export, use, destruction) of POPs containing articles/products and waste needs to be developed, in particular for fire-fighting foams and sulfluramid in case of the FSM.

#### 3.3.9.4 Criteria for evaluation and prioritization of options

The main criteria used when evaluating the PFOS, its salts and PFOSF in the FSM and prioritizing the management options in the country was represented by the major uses of PFOS, its salts and PFOSF within different sectors. In case of the FSM the major sectors to consider were the use of fire-fighting foams and sulfluramid.

#### 3.3.9.5 Action plan implementation strategy

In the FSM, PFOS and PFOA are present in imported articles, particularly fire extinguishing equipment. However the exact quantities (PFOS and PFOA) which are imported into the FSM are as yet unknown. National waste management practices will need to cope with problems related to the disposal of these substances.

**Table 14. PFOS, its salts and PFOSF management Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Establishing policy and regulatory framework for management of PFOS and related substances in the FSM | 1.1 Assessment of regulatory frameworks of other countries for controlling PFOS and related substances | National Government POPs Program Coordinator | Assessment completed  Policy and regulatory framework for management of PFOS and related substances established | March 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 1.2 Amend existing laws, or develop new laws related to the control and management of PFOS, including banning if necessary | FSM Attorney General’s Office to create restriction regulations  National Government POPs Program Coordinator at DECEM | October 2022 |
| **Objective #2:** Developing the inventory of PFOS use, containing articles and wastes | 2.1 Development of PFOS inventory in firefighting foams | National Government POPs Program Coordinator at DECEM.  State Environmental Protection Office staff. | Inventory of PFOS use and containing articles and wastes is developed | December 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff. |
| 2.2 Development of sulfluramid inventory | POPs Program Coordinator at DECEM.  State Environmental Protection Office staff. | December 2022 |
| 2.3 Development of PFOS inventory in consumer and other products and applications | POPs Program Coordinator at DECEM.  State Environmental Protection Office staff | December 2022 |
| **Objective #3:** Environmental soundmanagement of PFOS containing products, stockpiles and waste | 3.1 Investigating and compiling information on management of PFOS containing products at country level | National Government POPs Program Coordinator | PFOS containing products, stockpiles and waste are managed in an environmental sound manner  Information on PFOs stockpile management created.  Information on destruction of PFOs compiled.  Examination of the protocols in effect at facilities that would utilize equipment that contain POPs | March 2023 | All tasks Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 3.2 Assessing the management and destruction options of PFOS containing stockpiles and wastes at regional and/or international level | National Government POPs Program Coordinator | March 2023 |
| 3.3 Implementing environment sound management principles for destruction or export of PFOS containing waste | National Government POPs Program Coordinator | March 2023 |
| 3.4 Implementing BAT/BEP in exempted uses (fire-fighting foams and sulfluramid) | National Government POPs Program Coordinator | March 2023 |
| **Objective #4:** Assessing PFOS alternatives in fire-fighting foams and sulfluramid and substituting it by the most sustainable chemical and/or non-chemical solutions | 4.1 Compiling information on alternatives to PFOS and related substances from available guidelines provided by Stockholm Convention Secretariat and POPRC | National Government POPs Program Coordinator | PFOS alternatives in use/exempted uses are assessed and PFOS is substituted by the most sustainable chemical and non-chemical solution | June 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 4.2 Selection of the most sustainable alternative chemicals and/or non- chemical solutions in particular for fire-fighting foams and sulfluramid | National Government POPs Program Coordinator | July 2023 |
| **Objective #5**: Training and awareness raising for stakeholder groups on PFOS and related substances | 5.1 Informing and educating stakeholders including users (e.g. fire fighters; pesticides importers, dealers and users), policy makers and public on the environmental and health impact, environmentally sound management and on alternatives of PFOS and related substances | National Government POPs Program Coordinator | Training and awareness raising is provided to the stakeholder groups on PFOS and related substances | December 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 5.2 Training and educating the customs authorities on PFOS and related substances in articles and products. | National Government POPs Program Coordinator  Select FSM Customs and Tax Office Staff | December 2023 |

### 3.3.10 Activity: Register for specific exemptions and the continuing need for exemptions (Article 4)

#### 3.3.10.1 Context and analysis of issue

To enable Parties to the Convention to take measures to reduce or eliminate releases of POPs from intentional production and use, for which alternatives do not exist yet or are not readily available, the Convention allows Parties to register specific exemptions for a specific period of time. Annexes A and B to the Convention describe specific exemptions, as well as acceptable purposes, that are available with respect to the relevant POPs. Exemptions and acceptable purposes give Parties the time that may be needed to adapt and take the necessary measures required by the Convention, in order to reduce or eliminate releases of POPs. This could be through finding alternatives, phase out of uses of POPs or other measures etc. This is a dynamic issue, with numerous decisions related to exemptions and acceptable purposes having been adopted by the Conference of the Parties (Stockholm Convention website).

Parties need to register in order to benefit from the Convention’s provisions on specific exemptions listed in Annexes A or B. These specific exemptions have a limited timeframe and shall expire five (5) years after the date of entry into force of the Convention with respect to that particular chemical, unless an earlier date is indicated in the Register by the Party or an extension is granted by the Conference of the Parties. Parties may register for acceptable purposes listed in Annex B. Registers have been established for acceptable purposes relating to DDT and PFOS, its salts and PFOS-F(Stockholm Convention website).

The Convention also allows notification of POPs in articles in use, i.e. for chemicals occurring as constituents of articles manufactured or already in use before or on the date of entry into force of the obligation with respect to these chemicals. Similarly, Parties may register production and use of quantities of chemicals listed in annexes A and B as closed-system site-limited intermediates (Stockholm Convention website).

On list of POPs with specific exemptions and acceptable purposes several POPs have been included with exemptions (HBCD, DecaBDE, SCCP, Endosulfan, Lindane, PCN, PCP, POP-PBDEs, PFOS) and acceptable purposes (PFOS and DDT).

#### 3.3.10.2 Goals and objectives

The objective of this action plan is to establish an appropriate systematic methodology for determining when an exemption is needed to appropriately meet the obligations under Article 4 in future.

#### 3.3.10.3 Action plan implementation strategy

To decide if an exemption is needed an informed decision need to be made considering alternative chemicals and non-chemical solutions. Such an assessment is made by appropriate research institutions and committees. If after such a scientific assessment an exemption is needed, then the Secretariat of the Stockholm Convention/COP would be informed, and the exemption registered.

**Table 15. Register for specific exemptions and the continuing need for exemptions Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Setting up internal procedure for determining the need for registration of specific exemptions/acceptable purposes for POPs and for submitting a registration to Stockholm Convention Secretariat | 1.1 Developing an internal procedure for internal procedure for determining the need for registration of specific exemptions/acceptable purposes for POPs and for submitting a registration to Stockholm Convention Secretariat | National Government POPs Program Coordinator  FSM Attorney General’s Office to create registration procedures for the FSM. | Existence of an internal procedure for determining the need for registration of specific exemptions/acceptable purposes for POPs and for submitting a registration to Stockholm Convention Secretariat developed | June 2021 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| **Objective #2:** Determining the need for registration of specific exemptions/acceptable purposes for POPs in the FSM | 2.1 Organizing consultation meetings with stakeholders of those sectors where the use of POPs was identified during the inventory | National Government POPs Program Coordinator  Specific stakeholders | Need for registration of specific exemptions/acceptable purposes for POPs in the FSM determined | September 2021 | Meetings can be arranged in either F2F for virtual format as appropriate.  Coordination of meetings can be performed by the National Government POPs Program Coordinator at DECEM. |
| 2.2 Determining the specific exemptions/acceptable purposes needed in the FSM, based on predefined criteria of selection | National Government POPs Program Coordinator | December 2021 |
| **Objective #3:** Registration of specific exemptions/acceptable purposes for POPs for the FSM | 3.1 Preparing the registration form(s), as provided by the Secretariat of the Stockholm Convention | National Government POPs Program Coordinator | Specific exemptions/acceptable purposes for POPs for the FSM registered | March 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 3.2 Submitting the completed registration form(s) for registration of specific exemptions/acceptable purposes for POPs for the FSM | National Government POPs Program Coordinator | June 2022 |
| **Objective #4:** Assessing the continued need for the specific exemptions/acceptable purposes for POPs for which the FSM registered and notifying the Secretariat of the Stockholm Convention when requested | 4.1 Establishing an internal procedure for conducting the assessment for continued need for the specific exemptions/acceptable purposes for POPs for which the FSM registered | National Government POPs Program Coordinator  FSM Attorney General’s Office to create internal registration procedures for the FSM. | The continued need for the specific exemptions/acceptable purposes for POPs for which the FSM registered is assessed and the Secretariat of the Stockholm Convention is notified | September 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 4.2 Conducting the assessment of the continued need for the specific exemptions/acceptable purposes for POPs for which the FSM registered | National Government POPs Program Coordinator | December 2022 |
| 4.3 Notifying the Secretariat of the Stockholm Convention on the continued need or on withdrawing of the specific exemptions/acceptable purposes for POPs for which the FSM registered | National Government POPs Program Coordinator  DECEM | March 2023 |

### 3.3.11 Action plan: Measures to reduce releases from unintentional production (Article 5)

#### 3.3.11.1 Context and analysis of issue

According to Article 5, Parties are required to identify, characterize, quantify and prioritize sources of releases of unintentional POPs, and develop strategies with concrete measures, timelines and goals to minimize or eliminate these releases.

As of 2019, the following POPs listed in Annexes C, Part I to the Stockholm Convention:

* Hexachlorobenzene (HCB);
* Hexachlorobutadiene (HCBD)
* Pentachlorobenzene (PeCB);
* Polychlorinated biphenyls (PCB);
* Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF); and
* Polychlorinated naphtalenes (PCN).

#### 3.3.11.2 Goals and objectives

The action plan goal and objective is continuing minimization and, where feasible, ultimate elimination of unintentionally produced POPs listed in Annex C, Part I, for the relevant sources identified in the FSM.

#### 3.3.11.3 Relevant management options

To reduce the total releases of POPs derived from anthropogenic sources, the FSM is also required to implement best available techniques (BAT) and best environmental practice (BEP) for the relevant national sources out of the ones listed in Annex C, Parts II and III.

To facilitate the implementation of Article 5, a harmonized framework for elaboration of comparable release inventories of Annex C chemicals was developed and was used by the FSM. The framework it ensures that source inventories and release estimates are complete, transparent, as well as consistent in format and content. Detailed state-of the-art guidelines on best available techniques and guidance on best environmental practices are also available to facilitate implementation of BAT and BEP at the national level.

#### 3.3.11.4 Criteria for evaluation and prioritization of options

The prioritization of options was based on the relevant source categories releasing uPOPs, as identified during the inventory.

#### 3.3.11.5 Action plan implementation strategy

The first step in this action plan’s implementation strategy will be to establish a legal framework to support the reduction of uPOPs in the FSM, at both the national and state level. This will involve the creation of a policy that identifies approaches to accomplish the reduction from all sources. Human Resources needed technical expertise, training activities, policy writing technical assistance will be needed.

The second step in this action plan’s implementation strategy will be to identify and collect data concerning the sources of uPOPs in the FSM, followed by the use of the POPs Toolkit to refine the data and establish a baseline inventory for future comparative analysis.

The next step is to examine the impact of improved waste management practices on all of the FSM’s islands, with respect to the most dangerous of the uPOPs found in the nation. This is the “waste hierarchy” which indicates the POPs items which need the most urgent attention. The following step will be the creation and/or up-dating of legislation related to uPOPs monitoring and control. The legislation will include measures intended to reduce the negative impact of dumpsites and dumpsite burning, and also measures to eliminate illegal dumping of all wastes.

The next step in this action plan implementation strategy will be examining the options for effective dumpsite operations in each state, the creation of new (and the up-grading, or retirement of old) dumpsites, and utilizing BAT/BEP for all open burning options.

The following step in the process is to undertake a similar approach to the disposal and incineration of medical and biohazardous wastes. An examination of the current small scale incineration technology will help to identify the most efficient incineration methods for the islands. Following an assessment of the incineration operations in each of the states, the incineration methods and parameters best suited to the islands can be determined. Needed new installations or up-grading of existing incinerators can be procured and installed/upgraded as soon as funding is secured. Funding sources will be identified from government contacts, or contacts of members of the stakeholders groups. Non incineration options for biomedical wastes will be explored.

On-going efforts to create guideline policies for standards related to waste management should be completed at this time.

The final step in this action plan implementation strategy will be to improve the dissemination of awareness raising materials that will increase the dumpsites’ operators and staff’s knowledge about all types of POPs and uPOPs. A 100% portion of this population needs to comprehend and appreciate the potential dangers of POPs created by open burning. Guidance and awareness materials, training activities, violation enforcement, and use of BAT/BEP approach to directly influence dioxin and furan release reduction.

**Table 16. uPOPs reduction Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Developing, by December 2022, a National Solid Waste Policy to reduce in-country production of dioxins and furans. The policy will provide strategies to address and manage emissions from all potential sources. | 1.1 Identifying the “National Solid Waste Management Policy Development Coordinator” and members of the “National Solid Waste Management Policy Development Task Force” (NSWMPDTF)[[16]](#footnote-16) | National Government POPs Program Coordinator in consultation with NACPCM | Satisfactory (as scheduled) progress in identifying national level position and NSWMPDTF members, recruitment of consultant, study completed, workshop conducted, National Solid Waste Management Policy adopted, and relevant laws enacted | 30 June 2021 | Resources Needs (2021): $21,500  Resources Needs (2022): $45,000  Resources Needs (2023): $15,000 |
| 1.2 Developing scope of work, recruit consultant, and conduct survey of current waste management situation in the FSM | National Solid Waste Management Policy Development Coordinator and consultant | 31 December 2021 |
| 1.3 Conducting Policy Development Workshop to review survey results and develop National Solid Waste Management Policy, Consultant will facilitate workshop and pro-vide recommendations for consideration by the NSWMPDTF | National Solid Waste Management Policy Development Coordinator, NSWMPDTF, and consultant | 29 February 2022 |
| 1.4 Utilizing the National Solid Waste Management Policy to establish either national or state (as appropriate) legislation pertaining to the reduction of in-country production of dioxins and furans. | National Solid Waste Management Policy Development Coordinator, NSWMPDTF, state EPA Offices, Environmental Office in the FSM Departments of Health | 31 December 2023 |
| **Objective #2**: Updated sources and releases inventories for PCDD/PCDF | 2.1 Identify relevant source categories of uPOPs in the FSM | National Government POPs Program Coordinator  State Environmental Protection Office staff. | Sources and releases inventories for PCDD/PCDF updated | March 2023 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff. |
| 2.2 Setting up an activity data collection system and procedure from the relevant source categories | National Government POPs Program Coordinator  State Environmental Protection Office staff. | June 2023 |
| 2.3 Refine/update the uPOPs inventory using latest version of the UNEP Dioxin Toolkit | National Government POPs Program Coordinator  State Environmental Protection Office staff. | September 2023 |
| 2.4 Update the baseline uPOPs inventory in the FSM (the first uPOPs inventory done in the FSM), taking into considerations the latest version of the UNEP Dioxin Toolkit | National Government POPs Program Coordinator  State Environmental Protection Office staff. | December 2023 |
| **Objective #3:** Reducing uPOPs releases from open burning of wastes (private burning and landfill fires) and biomass burning by improvement of waste management | 3.1 Implementing waste hierarchy regulatory framework at national and state levels | National Government POPs Program Coordinator  State Environmental Protection Office staff | uPOPs releases from open burning of wastes (private burning and landfill fires) and biomass burning are reduced | March 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff and AG/Dept of Justice staff |
| 3.2 Developing a waste catalogue/list and describing related management options considering waste hierarchy | National Government POPs Program Coordinator  State Environmental Protection Office staff | April 2024 |
| 3.3 Developing a regulatory framework for controlling the open burning, including setting up penalties/fines | National Government POPs Program Coordinator  State Environmental Protection Office staff | June 2024 |
| 3.4 Taking measures for closure of dump sites and stopping illegal dumping of wastes (applying penalties and fines). | National Government POPs Program Coordinator  State Environmental Protection Office staff  Departments of Justice/Public Safety | June 2024 |
| 3.5 Assessing the options for constructing engineered landfills for remaining waste disposal | National Government POPs Program Coordinator  State Environmental Protection Office staff  State Public Works offices | July 2024 |
| 3.6 Implement BAT/BEP for open burning of waste,  including burning of landfill sites | National Government POPs Program Coordinator  State Environmental Protection Office staff  State Public Works offices | September 2024 |
| **Objective #4:** Reducing uPOPs releases from waste incineration (MSW and medical waste) | 4.1 Assessing the existent state of waste incinerators in the FSM | National Government POPs Program Coordinator  State Environmental Protection Office staff | uPOPs releases from waste incineration (MSW and medical waste) are reduced | January 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff. |
| 4.2 Determining the parameters for upgrading existent waste incinerators, as well as identify potential funding sources | National Government POPs Program Coordinator  State Environmental Protection Office staff | June 2024 |
| 4.3 Assessing of existent technologies to treat medical waste | National Government POPs Program Coordinator  State Environmental Protection Office staff | Assessment of technologies for uPOPs waste incineration (MSW and medical waste) are completed | June 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff |
| 4.4 Selection and implementation of the most cost-efficient technology for sound treatment of medical waste including also non-incineration technologies | National Government POPs Program Coordinator  State Environmental Protection Office staff | September 2024 |
| 4.5 Developing guidelines for sound management of MSW and medical waste | National Government POPs Program Coordinator  State Environmental Protection Office staff | September 2024 |
|  |  |  |
| **Objective #5:** Enhancing awareness raising on waste management for uPOPs reduction | 5.1 Developing guidance and awareness materials for detection, extinguishing and prevention of landfill/dumpsite fires | National Government POPs Program Coordinator  State Environmental Protection Office staff | Awareness raising on waste management for uPOPs reduction is enhanced  Guidance materials created  Training for landfill operators completed  Awareness programs about dangers of open burning conducted for the general public. | January 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff |
| 5.2 Raising awareness among the landfill operators on the impacts of open waste burning and implementing education programme for control | National Government POPs Program Coordinator  State Environmental Protection Office staff | June 2024 |
| 5.3 Delivering awareness raising programme and fines for open burning of waste at private level | National Government POPs Program Coordinator  State Environmental Protection Office staff  States’ AG/Dept. of Justices offices | June 2024 |
|  | 5.4 Educating operators and competent authorities on minimizing Dioxin/UPOPs release from waste incinerators and implement emissions control according to BAT/BEP | National Government POPs Program Coordinator  State Environmental Protection Office staff  State Public Works offices | Awareness programs about dangers of open burning and identification of UPOPs release, conducted for incinerator operators. | June 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Same for the State Environmental Protection Office staff |

### 3.3.12 Activity: Identification and management of stockpiles, waste and articles in use, including release reduction and appropriate measures for handling and disposal (Article 6) and Activity: Identification of contaminated sites (Annex A, B, and C Chemicals) and, where feasible, remediation in an environmentally sound manner

#### 3.3.12.1 Context and analysis of issue

In the Federated States of Micronesia, a priority concern is the potential for air, soil, nearby ocean waters and marine environments, inland waterways and streams, to be contaminated by hazardous wastes, including the most dangerous one which are referred to as Persistent Organic Pollutants (POPs). An equally important, but more urgent priority is human morbidity and mortality due to direct exposure to toxic materials, and indirect exposure by consumption of contaminated food stuffs and/or air and/or water. This is a very real possibility if these dangerous POPs substances are not properly used, stored and disposed.

The dangers of these substances threaten people all around the world, in every country. These dangers do not stop at international or regional boundaries. Due to the very fragile nature of the FSM’s ecosystems, the nation must be extremely vigilant in its efforts to protect the country’s terrestrial, aquatic and marine biospheres. Therefore, the only way to eliminate the danger of POPs is with the full cooperation of every country.

A number of these dangerous substances have been introduced to the islands in the years dating back to WWII and possibly earlier. The first POPs started showing up in the late 1800s. Many of these substances may have been used during the construction of the various islands’ physical infrastructure when the hazardous properties of the substances were not yet known or fully appreciated. Other hazardous materials have been brought to the FSM in the form of ingredients of pesticides, insecticides, fertilizers, and in various kinds of equipment. Although the number and quantities of these hazardous substances may be relatively small in comparison to amounts in larger and more developed countries, the small size and fragile environments of the nation’s islands result in a situation in which even “small” quantities of a contaminant may pose grave and irreparable damage to delicate marine and land-based eco-systems, in addition to numerous health problems. In some cases POPs exposure is measured in parts per million (or ppm); an indication that only very miniscule amounts of these substances can cause harm to humans, animals and the environment.

Since the first twelve POPs were identified, decades ago, efforts have been undertaken to eliminate production of these substances. In cases where elimination proves to be impossible (for a number of valid reasons), the manufacture, importation, and use of these chemicals is restricted, by state or national law, or by international agreement. By 22 May 2002, 151 countries, including the Federated State of Micronesia, had signed the Stockholm Convention on POPs. By May of 2005, the FSM had also ratified the treaty. In 2006, the FSM completed and submitted its first National Implementation Plan (NIP) for POPs Chemical Management.

In the years since the FSM’s first NIP was completed, additional hazardous and toxic chemicals have been added to the POPs list. Most of the new sixteen (16) chemicals are by-products of various manufacturing processes, while a few are also chemical substances that are included in items found in retail stores in pesticides, insecticides, and some flame retardant materials such as those used for insulating electronic components from excessive heat, or included in personal protective equipment (PPE) for fire fighters.

FSM state and national laws ban or restrict the importation of many dangerous substances, including most POPs containing substances into the country. State Environmental Protection Agency (EPA, or the equivalent) offices require registration of all pesticides or insecticides brought into the country. However, imports of hazardous materials occurred during the Trust Territory period, perhaps before, and also in more recent times. Inspection of imports by customs officials does not cover 100% of all shipping containers and other packages brought into the country. Furthermore, the inspection of imports is primarily performed by officers of the Department of Finance who are determining tax assessments, or by staff of the Quarantine Office who are searching for agricultural threats. None of these inspectors is tasked to identify hazardous chemicals or similar substances, nor have they received any training for this task. A specific level of certification would be required to do this type of surveillance work.

Personnel in each of the four states now have some capacity to test for PCBs, but not for all POPs and other hazardous substances. After the submission of the original NIP, test kits were available for PCBs and training on the use of these kits has been conducted, assessments completed, and most if not all PCBs have been removed from the country. For other substances, different kits and associated trainings will be needed. External expertise will be necessary to provide this training and also to assist with identification, as necessary. Local (in-country) laboratory capacity is not sufficient to test and identify most POPs and other hazardous substances. If not available, protective gear for the work will be required. The assistance of out-of-country laboratory services will be necessary and a cost analysis must be completed to determine to most effective and efficient manner in conducting the various testing procedures.

At the time of this writing, in each FSM state, a small number of hazardous and potentially hazardous materials have been identified by EPA personnel during the up-date phase of the new POPs project. Initial inventories have been started, listing the pertinent details of these identified substances. Over the years some of these materials have been collected and stockpiled in the state centers, but some have not, and remain located where human exposure or environmental contamination is possible. The very real possibility still exists that other unidentified hazardous materials remain at undetermined locations. The assistance of the general public will be required for the identification of other potential remaining POPs and other hazardous substances, and their locations. Public awareness programs about POPs will be needed to create this knowledge among members of the community.

Decisions will be made to determine the next steps as the realities of the status of the POPs situation become known. Some materials may be reused if a legitimate need can be addressed and any potential negative effects can be avoided or sufficiently minimized to reduce human or environmental harm to acceptable safe levels.

All other POPs and other hazardous substances must be disposed in an environmentally sound manner either in-country or overseas. The needs for appropriate storage and disposal methods for each particular substance must be determined. With its limited option due to geographical nature of the country, overseas disposal is the only option for many POPs and other hazardous substances in the FSM. Thus secure storage in a safe facility is necessary until export for destruction is possible. The current situation with regard to storage sites for POPs and other hazardous substances is that each state had established a provisional facility about twelve years ago, but the structures and their locations may no longer meet the safety specifications necessary for storage of such toxic materials. These facilities need to be physically inspected for safety prior to use, or new storage facilities built altogether to properly store and contain stockpiles.

The clean-up of contaminated sites completes the action plan; it is the last step in the process of restoration of the land to a safe status similar to pre-contamination days. Identification, assessment, and rehabilitation may require some expertise beyond that available in-country. The involvement of the public is necessary as it is possible that additional contaminated sites may be discovered. The on-going task of checking for contaminated sites cannot be totally abandoned until the import of POPs is completely under control. The recognition that there may be remaining unidentified sites and that the continued monitoring of known sites has to continue, must be an underlying component of an overall chemical management plan.

Presently, no formally organized pool of expertise in the area of hazardous waste and contaminated sites management exists in the FSM. The state EPA offices have varied, but limited, levels of capacity depending on past educational attainments of the staff and other relevant trainings which have been provided, including workshops, on-the-job instruction and more formal courses at overseas institutions or laboratories. There is a need to develop and organize an appropriate local body of POPs and other hazardous substances expertise so that appropriate in-country capacity exists to address problems in this important area. Lower in-country costs could be realized by utilizing a regional approach to some of the work.

#### 3.3.12.2 Goals and objectives

The overall goal for this action plan is to identify, collect, place into secure storage, and ultimately dispose of all existing stockpiles of POPs substances, obsolete chemicals, and other hazardous wastes from the territory of the Federated States of Micronesia, and to restore any contaminated sites to a safe condition. There are seven main objectives to be met in order to reach this goal:

1. To establish, by 30 June 2021, a National Advisory Committee for POPs Chemical Management (NACPCM) in the FSM.
2. To complete, by the end of 2021, a comprehensive inventory of all POPs and other hazardous substances stockpiles and contaminates sites in the country, including those presently known and as many of the unknown as can be discovered and identified.
3. To construct, by the end of 2022, an appropriate storage facility, or facilities, for POPs and other hazardous substances in each FSM state.
4. To collect and transport, by the end of 2023, all identified POPs and other hazardous substances to the storage facilities and prepare them for off-island disposal or other appropriate disposition.
5. To export, by the end of 2024, all collected POPs and other hazardous substances from each state’s storage facility to an out-of-country disposal facility.
6. To, by the end of 2024, rehabilitate or otherwise eliminate any possibility of being a source of toxic exposure, all known and as many as possible of the yet-to-be discovered, contaminated sites in the country.

To, by the end of 2024, establish a system that will 1) monitor all sites (rehabilitated or still contaminated) until no longer necessary, and 2) facilitate the identification of any overlooked or recently contaminated sites. 3) support needed training to ensure capacity development is up to date and can ensure vigilant monitoring, compliance with imports regulations to ensure no stockpiles are re-created.

#### 3.3.12.3 Relevant management options

This action plan, targeting the identification, collection, storage, and disposal of POPs and other hazardous substances found in the FSM, and the follow-up decontamination of polluted sites, is a relatively straightforward effort, although the scope of the work to be accomplished is varied and substantial. Accompanying activities, relevant to the project, would include a review of national and state level legislation, and developing strategies for improving in-country expertise.

Local capacity should be developed to the extent that it is cost effective to address the local demand for these services. This will require that local staff be given training in sample collection and preparation of the samples for shipping to overseas locations. Regional cooperation among neighboring nations by sharing certain aspects of foreign laboratory analysis or training programs could possibly reduce per-country expenses.

It will be necessary to then determine disposition action after substances are identified. The capacity in the FSM to safely destroy POPs or other hazardous materials is limited, and therefore it is possible that some POPs will be sent out-of-country for final disposal.

In the event that in-country destruction is an alternative, the storage facility to be constructed in each state could include this function in its design.

The country’s legal mechanism which addresses the various POPs issues has expanded since the first POPs report was published, more than ten years ago. The scope now includes 12 (out of 16) of the new POPs, as well as the first 12 POPs. At the present time, the legal mechanism is most effective for importation and registration activities. Specific POPs issues include importation, so it is important that information on the ingredients of a particular product be available to Customs Inspectors. The registration of restricted items is another government requirement which requires skilled staff to accurately conduct their operations. The development of in-country expertise could result in more accurate interpretation of the information being provided to the nation’s leadership.

It is anticipated that, encouraged by the present need, an FSM national, who is devoted to the notion that he or she is protecting the islands that have supported the lives of family, relatives, and ancestors, may develop the commitment and enthusiasm to become a community champion of this important work. The College of Micronesia-FSM provides an Associate Degree and a Third Year Certificate in Public Health. Graduates of these programs can continue for a baccalaureate, or more advanced degree work in the field. In the interim, external expertise may be required.

It is unlikely, but the possibility exists, that an identified POPs or other hazardous item may currently be in use, or may have value for a potential future use by some individual, business, or other entity. Each such case will need to be investigated, and a determination made based on scientific evidence, existing local regulations (if any), or by relevant international agreements, if applicable. Any such action will be handled by the FSM DECEM, or one of the four state Environmental Protection Agencies (or equivalent) as deemed appropriate. The legal opportunity that is presented by the investigation to permit use, or entry, of a questionable substance, should also be utilized as an occasion to update the national and state laws and regulations concerning POPs and chemical management in general.

The use, as opposed to the destruction or removal, of any POPs and other hazardous items must be carried out in a manner which, and in areas where, the possibility of human exposure or release into the environment is minimized to an acceptable extent. Regular monitoring reports must be submitted to the appropriate offices until the use of the hazardous material is fully completed.

The overall legal framework to support all of the above will be completed in the accompanying Action Plan dealing with the legal aspects of chemical management. When completed, the legal framework must prohibit the import of any POPs and other hazardous items and require that any such material which is discovered in the FSM must be immediately reported to the appropriate authority, either the state Environmental Protection Agencies (or equivalent), or the police. Law enforcement officers may require training to instruct them on the safety procedures associated with POPs and other hazardous items.

Reporting requirements (content and schedules) relevant to the project will need to be established. Necessary information will include details (nature, volume, condition, etc.) of the POPs and other hazardous substances that are identified, the locations of contaminated sites, the progress of the collection activities, and available transport alternatives. Additional information to be conveyed should include an analysis of safety concerns, status of storage facility construction, inventories, and finally the progress of disposal efforts. Monitoring reports on the rehabilitation of polluted sites will be ongoing until sites are deemed by knowledgeable authorities to be completely decontaminated and safe.

The management and security of storage facilities must also be carefully considered. Information on inventories will need to be maintained, and regular monitoring of the substances and their containers will be necessary. Rapid response strategies to promptly address any possible leaks or discharges of POPs or other hazardous substances will need to be prepared, as will a response plan to deal with possible damage sustained from natural disasters, particularly typhoon force winds, or floods caused by typhoons or tides. The eventual remediation of storage sites no longer in use is a final activity to be arranged in conjunction with the clean-up of contaminated sites.

The effort needed to restore the sites that have been contaminated with POPs and other hazardous substances will require expertise in risk assessment, testing and monitoring, land and legal issues, public relations and awareness education, and soil rehabilitation. All of the locations which have had POPs and other hazardous substances removed will require testing, and if needed, decontamination.

There is the possibility that other, as yet unidentified contaminated sites exist, where more POPs and other hazardous substances may be discovered. It is also possible that contaminated areas may no longer have any visual evidence of the contaminating agent. Public health statistics and other information can be utilized to help identify pollution source sites. Public awareness information needs to explain to people how to identify a possible contaminated site, how to interpret personal medical problems due to POPs or other hazardous substance exposure, and then who to contact.

After being identified, contaminated sites will need testing, removal of any POPs, and then removal or neutralization of contaminated soils and other materials. Sites which cannot be restored must be cordoned off, secured, and posted to prevent any possibility of further environmental or human exposure episodes. Monitoring must continue, following the full completion of the restoration effort, until the time when an area can be certified to be absolutely clean and safe.

Training of local staff may be needed to ensure that the packaging of all materials, in preparation for overseas transport, is performed in compliance with applicable national and international regulations and specifications. External technical assistance and certification of proficiency may be required. All shipping arrangements and eventual acceptance at the destination port will need proper communication and coordination among all concerned parties, led and facilitated by DECEM.

The need to safely manage chemicals, whether the substance is one of the original twelve POPs, or one of the 16 new POPs, or any other potentially dangerous chemical, is an essential public safeguard. The need will not disappear in the near future and even the final elimination of the 28 POPs will probably not signal the end. Many materials in use today are hazardous, most not at a level equivalent to our present POPs, but these other items may need to be controlled nonetheless. It is also likely that additional substances will be added to the POPs list in the future.

To provide long term direction, and to maintain the professional safety certification standards necessary for chemical management in the FSM requires a joint national and state level oversight body. The “National Advisory Committee for POPs Chemical Management (NACPCM) will be formed of members with insight and expertise in various aspects of the hazardous waste issue and would represent international, national, and state interests.

#### 3.3.12.4 Criteria for evaluation and prioritization of options

**1. Local and external expertise:**  If currently available local expertise determines that additional assistance is needed to complete some of the tasks or activities involved with hazardous waste storage, disposal, and contaminated site clean-up, then such a consultant should be recruited. This expert would assist the FSM DECCEM office and the four state Environmental Protection Agencies (or equivalent) with identifying what other substances or items, in addition to those already identified during the first phase of the POPs Project, may likely be found on the nation’s islands, atolls and reefs, and in fresh waters, lagoons, and oceans.

This information will be used to create a list of items that may be present in the country, which will assist in focusing the search effort. The identification of potential contaminated sites in addition to those already identified, is a task that should also be included in the terms of reference. Furthermore, a consultant can assist with the design of the awareness campaign to first inform the general public of the dangers of POPs and familiarize them with the related activities, and next, to involve residents in the hazardous waste and contaminated site identification effort. The terms of reference for consultants must clearly include the up-scaling of local capacity as a critical component of the scope of work.

**2. Scheduling of activities:** Nearly 100% of POPs activities relevant to this Action Plan do not require specific dates or time periods to be established, the timeframe is somewhat flexible. The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the suggested timeline, and if funds are available to move on to the next step. On occasion, there may be a POPs-related public health emergency such as a chemical spill or a fire fueled by dangerous chemicals. To effectively and promptly deal with such events, it is wise for a nation to have created a properly equipped emergency response team and a financial reserve, or other such fund, which can support immediate emergency response expenses.

The identification and collection of all POPs and other hazardous items at the storage facilities should be completed as soon as possible, to minimize any further human or environmental exposures. This is the first step for this Action Plan. The step is complete when all POPs have been identified and assigned an appropriate disposal option.

In step two, these hazardous items are in now storage, the schedule can be adjusted as needed by the arrangements for the next step, or by resource availability. As soon as transportation and any alternative disposition requirements are understood, it will be best that removal and disposal be scheduled as expeditiously as possible.

**3. Storage:** Storage facilities must be routinely monitored to prevent any possible containment problems, and arrangements for removal to off-island disposal facilities should be completed without undue delay. To achieve an effective, well synchronized removal effort, good coordination among all of the various offices involved in the collection, storage, and the transport services, is essential. The determination can be made to ship substances off island, permanently store, or neutralize the hazardous substance. Another decision is to allow substances to remain in situ until removal from the island is possible, or remove immediately to a secure storage facility.

The range of functions of the storage structures may include: temporary and short term storage; long term, possibly permanent storage; and the structure may house the process needed which would neutralize certain of the POPs or other hazardous substances. Incineration might be an option for some of the substances. When a reliable estimate of the variety and volume of the different substances is available, it will be possible to determine the functions that will need to be incorporated into the design.

The number and size of storage facilities depends on the amount of POPs and other hazardous items that are identified, and the locations. Most of these items will be located in the state centers, however items may also be found on outer islands. The cost and danger of transporting these items must be carefully evaluated against the cost and feasibility of encapsulating them in an additional storage facility where they are now located, and the potential for human or environmental exposures if this option is chosen. Also, a consideration is the ability of the ship, which may eventually remove the items to another island for storage in anticipation of out-of-country disposal, to safely collect the items at each location. Outer Island dock facilities vary from state to state. Provided that the POPs are of small volume and weight, and can be safely packaged, the state field trip ships will be able to provide transport to the storage facilities in the state centers.

Depending upon the port or dock capabilities at islands with quantities of POPs and other hazardous materials, and the requirements of the removal transport vessel, it may not be necessary to first ship items to the state centers. It may be safer and more cost effective for the removal vessel to visit all islands with docks capable of handling such a ship. This determination will need to wait for the final inventory of items to be transported so that accurate assessments of quantities and safety considerations can be completed.

Subject to the results of the surveys to identify all of the remaining POPs and other hazardous items in the FSM, it may be more cost effective to secure the services of out-of-country experts to collect and transport the identified items. The capacity of local experts and the availability of necessary transport and protective equipment will need to be assessed, and then the cost to complete the necessary work calculated. The scope of work identified from this calculation can then be utilized to develop a request for proposals from external experts. A regional organization such as UN/GEF, SPREP, or possibly SPC could assist in handling these arrangements.

**4. Contaminated Site Restoration:** The course of action to be followed once the POPs and other hazardous items are removed from a specific location, will involve an analysis of the level of contamination remaining at the site and the determination of the efforts necessary to rehabilitate the area. It is anticipated that all toxic substances would be removed during the first collection work, and transported to the storage facilities. However, a possibility exists that remaining toxic material may be discovered, thus an additional final contamination analysis of the sites will be necessary as one of the initial steps of the rehabilitation effort.

The same analysis should be considered concerning the rehabilitation of the nation’s contaminated sites. The local capacity, both human and material, must be evaluated to determine whether to employ local, versus out-of-country expertise to implement activities related to the clean-up of contaminated sites. Until an appropriate level of local monitoring capacity exists, external expertise may be necessary. Again regional organizations may be tapped to provide such assistance.

#### 3.3.12.5 Action plan implementation strategy

The coordination of this POPs and other hazardous items identification, collection, storage, and disposal project and the restoration of contaminated sites, will involve the FSM-DECCEM Office, the four state Environmental Protection Agencies (or equivalent), and other entities (such as local NGO’s and the media) for activities involved with the awareness campaign. The object of the public awareness program is to secure the assistance of an informed general public to identify the locations of any remaining POPs and other hazardous items in the country.

The services of a consultant with knowledge regarding POPs and other hazardous item clean-up may be necessary. The consultant can also assist with the effort to create an improved level of in-country management expertise in POPs and other hazardous items. The development of the national steering committee is an essential component to the long-term effectiveness of this hazardous waste identification, collection, storage, disposal, and contaminated site restoration project, as well as to the continuing overall safe management of chemicals in the country. Each FSM state is presently examining the existing membership of state level chemical management groups in order to update membership to include as much on-island expertise as possible.

The FSM DECEM Office will be responsible for procuring and managing the technical assistance necessary in order to support the activities of each state as they complete the comprehensive inventory of any known POPs and other hazardous items, identify any remaining POPs and other hazardous items, coordinate the services of overseas laboratories, provide specifications for the construction of storage facilities, and also for the arrangements necessary for the transport of the items out of the country for final disposal. The procurement of any external expertise necessary to complete the final assessment and decontamination of polluted sites would also fall under the responsibilities of DECEM.

The responsibilities of the four state Environmental Protection Agencies (or equivalent) will include the actual state-wide survey to identify any remaining POPs and other hazardous items. The technical support, provided by the national government, will support the design and construction of storage facilities, the collection and transport of all POPs and other hazardous items to the storage facilities, the proper packaging of these items for eventual removal, and securing the required approvals for transport and trans-shipment of these materials for final disposal.

The FSM States have the responsibility to conduct the final site assessment and rehabilitation/restoration activities as needed. Although it is expected that all hazardous and contaminated materials will be removed from sites during the main identification and transport phase, it is possible that some dangerous materials may still be discovered as these already polluted sites are examined. Monitoring of decontaminated sites will be on-going until testing reveals acceptable levels for the safeguarding of the population and environment. The storage facilities and any site that cannot be decontaminated must be monitored on a continuing basis, and secured from access by the public.

The work plan, including objectives, is as follows:

**Table 17. POPs stockpiles and wastes management Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Establishing and scheduling an initial meeting, by 30 September 2021, of a National Advisory Committee for POPs Chemical Management (NACPCM) in the FSM, with subsequent Annual Meetings in 2022, 2023, 2024. Each state establishes an NACPCM group from which representatives attend face to face meetings. Other-wise all members can participate in teleconference meetings. All the state level NACPCM members together comprise the FSM NACPCM. | 1.1 Developing draft Terms of Reference, other documents, and determine size of NACPCM membership. | National Government POPs Program Coordinator and POPs National Advisory Committee for POPs Chemical Management | Satisfactory progress in drafting documents, collecting names of potential members, determining membership, and completion of organizational meeting with finished documentation for formalizing the NACPCM, future meetings (2022, 2023, 2024) convened, and records maintained. | 31 August 2020 | Resource Needs (2021): $21,000  Resources Needs (2022, 2023, 2024): $99,000 |
| 1.2 Creating list of potential members in the FSM for the NACPCM, contacting to ascertain willingness to serve, determining which willing potential members should be invited to serve. | State level POPs Program Coordinator | 31 March 2021 |
| 1.3 Scheduling and convening initial NACPCM organizational meeting to complete final Terms of Reference, By-laws, and other organizing activities. Meeting format TBD. | National Government POPs Program Coordinator and POPs consultant as meeting facilitator | 30 June 2021 |
| 1.4 Scheduling and convene NACPCM Annual Meetings (suggested in January), and other working meetings (June) as necessary, for 2022, 2023, 2024. Meeting format TBD. | NACPCM and National Government POPs Program Coordinator | 31 January and 30 June each year |
| 1.5 Providing on-going maintenance of NACPCM files and records, including POPs and other hazardous items lists, contaminated sites lists, and other relevant information. | National Government POPs Program Coordinator | January 2021 |
| **Objective #2**: Completing, by the end of 2021, a comprehensive inventory of all POPs and other hazardous substances stockpiles and wastes in the country, including those presently known and as many of the unknown as can be discovered and identified. | 2.1 Creating list of all potential items and suspected sites, in the FSM, that may contain POPs and other hazardous items. List will be maintained on a permanent basis at the state level POPs Program Offices, with duplicates at the national offices. | National Government POPs Program Coordinator, and short term PCB consultant who will provide training workshop on this topic | Satisfactory (as scheduled) progress in creation of lists, training workshop conducted, laboratory contract(s) arranged, equipment procured, Public Service Announcements broadcast, “requiring further action” log completed, sample reports received from overseas laboratories. Activities at state level reported monthly from state Environmental Protection Agencies to National Government Pop’s Program Coordinator. | January to March 2021 | Resource Needs (2021): $86,000  Resource Needs (2022): $36,000 |
| 2.2 Identifying and contracting with overseas laboratories to provide analytical services as needed. | National Government POPs Program Coordinator | March to June 2021 |
| 2.3 Identifying and procuring needed test kits, protective gear, and other necessary tools/equipment, and training on their use. | Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator | March to June 2021 |
| 2.4 Creating, translating, and broadcasting public Service Announcements (seeking assistance from the general public with POPs and other hazardous items identification); information further disseminated by NGO efforts; system developed in each state to record and add responses to the “potential items and suspected sites” list | National Government POPs Program Coordinator and staff of each state Environmental Protection Office | March to June 2021 |
| 2.5 Physically locate and identify stockpiles, wastes and sites identified on the “potential items and suspected sites” list, including responses from the general public, and classify as “non-hazardous” or “requiring further action”. Complete log description of details concerning each “further action” item. | Staff of each state Environmental Protection Office | July 2021 to June 2022 |
| 2.6 As necessary, packaging and shipping samples to contracted laboratories. As results reports are received, add items/sites to “requiring further action” list, if hazardous. | Shipping arrangements coordinated by National Government POPs Program Coordinator | July 2021 to June 2022 |
| **Objective #3**: Constructing, by the end of 2022, an appropriate storage facility, or facilities, for POPs and other hazardous substances stockpiles and wastes, in each FSM state, to be deposited while waiting for final disposal. | 3.1 Utilizing the information gathered for Objective #2, determine first if there is a need for secure storage. If the need exists, that same information will help to determine the size and other specifications necessary for construction of appropriate storage. If the quantity of stockpiles and wastes found in locations other than the state centers warrant additional storage facilities outside of the state centers, determine the specifications for these structures also. If a facility is to be utilized for short term or permanent storage, or to provide a destruction processing function, these considerations must be included in the design. | Staff of each state Environmental Protection Office in consultation with National Government POPs Program Coordinator | Satisfactory progress/schedule in developing building specifications, determining locations, completing construction, and delivery of substances. Monthly progress reports from state Environmental Protection Agencies will be submitted to National Government POPs Program Coordinator. | April to June 2022 | Resources Needs (2022): $340,000  Resources Needs (2023, 2024): $20,000 |
| 3.2 Determining the best available location for each storage facility. | Staff of each state Environmental Protection Office | April to June 2022 |
| 3.3 Arranging for a qualified contractor to construct storage facilities as planned in steps 1 and 2 and commencing construction. | Monitored by National Government POPs Program Coordinator and staff of each state Environmental Protection Office | April to December 2022 |
| 3.4 Arranging for an appropriate professional maintenance and surveillance of storage facilities in each state. | Supervision by staff of each state Environmental Protection Office | January 2023 – December 2024 |
| **Objective #4**: Collecting and transporting, by the end of 2023, of all identified POPs and other hazardous substances stockpiles and wastes to the storage facilities and then prepares them for on-island storage or destruction, or prepares a shipment to be transported for off-island disposal or other appropriate action. | 4.1 Arranging for appropriate state vehicles/boats/ship (and necessary POL) to transport stockpiles and wastes included on each state’s “further action” list to the assigned storage facility. | Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary | Satisfactory progress in transport of POPs and other hazardous items as evidenced by arrival at storage facilities, and packing of items, as reported quarterly from state Environmental Protection Agencies to National Government POPs Program Coordinator. | January to December 2023 | Resources Needs (2023): $84,000 |
| 4.2 Scheduling packaging and collection activities/availability of vehicles and boats/ships. | Staff of each state Environmental Protection Office, Transportation Office in each state for outer island transport as necessary | January to December 2023 |
| 4.3 Determining the disposition of each substance present in stockpiles and wastes (out-of-country disposal, in-country destruction, or permanent in-country storage) utilizing the information gathered in Objective #2. | Staff of each state Environmental Protection Office | July to December 2023 |
| 4.4 Perform in-state disposal of select stockpiles and wastes. | Staff of each state Environmental Protection Office or contractor | July to December 2023 |
| 4.5 At each storage facility, package items, as necessary and according to the international standards, for removal to out-of-country disposal. | Staff of each state Environmental Protection Office | July to December 2023 |
| **Objective #5**: Exporting, by the end of 2024, of all collected POPs and other hazardous substances stockpiles and wastes from each state’s storage facility to an out-of-country disposal facility. | 5.1 Identifying and initiating arrangements with shipping company that has capability to transport POPs and other hazardous items from the FSM to the disposal facility. | National Government POPs Program Coordinator | Satisfactory progress in completing arrangements, transport of POPs and other hazardous items to out-of-country and arrival at disposal facility. | April to June 2023 | Resources Needs (2023):  NG POPs Program Coordinator  Resources Needs (2024): $24,000 |
| 5.2 Completing necessary permits and other paperwork to comply with regulation of the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and their Disposal, and any other relevant national, regional, or international control instruments. | National Government POPs Program Coordinator | July to September 2023 |
| 5.3 In consultation with disposal facility, shipping company, and State Environmental Protection Agencies, establish schedule of ship arrivals at each FSM state. | National Government POPs Program Coordinator | October to December 2023 |
| 5.4 Providing ship arrival information to State Environmental Protection Agencies, giving sufficient lead time for Staff of each state Environmental Protection Office to arrange for items to be transported to the dock. | National Government POPs Program Coordinator and Staff of each state Environmental Protection Office | During 2024, as necessary |
| 5.5 Upon successful pick up, informing the disposal facility that collection has occurred and provide estimated date of arrival. | National Government POPs Program Coordinator | During 2024 as necessary |
| **Objective #6**: By the end of 2024, rehabilitating or otherwise eliminating all identified sources of toxic exposure from contaminated sites. | 6.1 Procuring, if needed in addition to items obtained during Activity 2.3, testing kits, protective gear, and other necessary tools and equipment. | Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator | Satisfactory progress in procuring needed testing gear and materials, broadcasting Public Service Announcements, analysis of all identified contaminated sites, laboratory testing as necessary, removal of any remaining hazardous materials and transport to storage, decontaminating or securing sites as necessary. | July to December 2023 | Resources Needs (2023): $17,000  Resources Needs (2024): $183,000 |
| 6.2 Creating, translating, and broadcasting public Service Announcements (seeking assistance from the general public with the identification of undiscovered sites); information further disseminated by NGO efforts; system developed in each state to record and add responses to the “potential suspected contaminated sites” list. | Staff of each state Environmental Protection Office | July to December 2023 |
| 6.3 Developing a methodology to systematically identify and prioritize POPs contaminated sites considering available guidance documents |  |  |
| 6.4 Training and upgrading skills of personnel in the assessment, securing and remediation of contaminated sites. |  |  |
| 6.5 Conducting an analysis of all suspected contaminated sites in the FSM using the information collected during Activities 2.1 and 6.2 to determine the type of decontamination process that will be needed at each site. | Select staff of each state Environmental Protection Office and short term PCB consultant who will provide training workshop on this topic | January to March 2024 |
| 6.6 Utilizing overseas laboratories to provide analytical services as necessary. | National Government POPs Program Coordinator | January to June 2024 |
| 6.7 Removing, if necessary, any remaining POPs or other hazardous substances, and decontaminate the sites by removing or neutralizing contaminated soils and other materials. | Select staff of each state Environmental Protection Office | January to June 2024 |
| 6.8 Securing by perimeter fencing and posting, any site which cannot be restored to pre-vent any possibility of further environmental or human exposure episodes. | Staff of each state Environmental Protection Office | July to September 2024 |
| **Objective #7**: Establishing, by the end of 2024, a system that will 1) monitor contaminated sites until no longer necessary, and 2) facilitate the identification of any overlooked or recently created contaminated sites. | 7.1 Procuring long-term monitoring equipment as required by each state. | Staff of each state Environmental Protection Office identifying needs, procurement arrangements coordinated by National Government POPs Program Coordinator | Equipment procured, establishment of monitoring efforts, and “warning” protocol developed at workshop, and in use by health care providers. | July to December 2024 | Resources Needs (2024): $35,000 |
| 7.2 Continuously monitoring on an appropriate timetable, subsequent to completion of restoration, all sites until the time when an area can be certified to be absolutely safe. | Staff of each state Environmental Protection Office | on-going from October 2024 |
| 7.3 Conducting workshop for health care providers to develop Public Health “warning” protocols to be utilized in order to help identifying pollution source sites from information such as patient symptoms and medical statistics. | National Government POPs Program Coordinator and short term consultant who will conduct training workshop | October 2024 |
| **Objective #8**: - Improving the environment status of all known and suspected, potential contaminated sites in the country, including and paying particular attention to dumpsites on all islands, state centers, lagoon islands, and outer islands. | 8.1 Providing for a final confirmation of the environment status of all known and suspected, potential contaminated sites in the country, including all dumpsites. Create database of all 1) sites in the country that have been contaminated in the past, 2) sites requiring clean up, and site needing rehabilitation. | National Government POPs Program Coordinator, NACPCM, state level EPA staff | Satisfactory progress in identifying and procuring needed equipment, arranging preventive maintenance/calibration service contracts, and arranging for training sessions relative to the new equipment. | December 2022 | Resource Needs (2022):  NG POPs Program Coordinator  Resource Needs (2023):  NG POPs Program Coordinator  Resource Needs (2024):  NG POPs Program Coordinator |
| 8.2 Procuring any additional testing tools, such as soil test kits, to conduct the confirmation work described in objective 8.1. | National Government POPs Program Coordinator, state level EPA staff | June 2023 |
| 8.3 Arranging for final clean-up and rehabilitation of any site still showing any traces of contamination. | National Government POPs Program Coordinator, NACPCM, state level EPA staff | December 2024 - |

### 3.3.13 Activity: Facilitating or undertaking information exchange and stakeholder involvement

#### 3.3.13.1 Context and analysis of issue

In accordance with the provisions of the Articles 9 of the Convention, the FSM needs to shall facilitate or undertake the exchange of information relevant to:

(a) The reduction or elimination of the production, use and release of persistent organic pollutants; and (b) Alternatives to persistent organic pollutants, including information relating to their risks as well as to their economic and social costs.

The information exchange between the Parties of the Stockholm Convention is performed via the National Focal Points and with the support of the Secretariat of the Stockholm Convention.

Regarding the content of the information exchange, the Parties to the Convention exchange information on the activities directed to reduce or eliminate POPs and on the risk imposed by POPs to humans and environment, including information of involved socio-economic costs.

#### 3.3.13.2 Goals and objectives

This action plan is meant to support and establish a system for exchanging information on between the FSM and other Stockholm Convention Parties.

#### 3.3.13.3 Relevant management options

Information exchange and stakeholder involvement are activities to be elaborated for the implementation of the NIP. The development of a comprehensive strategic information exchange and communication plan will be one step to take in order to achieve successful implementation of the NIP.

#### 3.3.13.4 Criteria for evaluation and prioritization of options

The criteria for evaluation and prioritization of options took into consideration the nature of the information to be exchanged.

#### 3.3.13.5 Action plan implementation strategy

The communication plan must also ensure that POPs-management issues will be addressed through various media - a website and other means of communication, in order to raise public awareness and to receive full collaboration. Due to the complexity of the increasing numbers of POPs and POPs-like chemicals close information exchange on regional and international level is needed for continuous updated information.

**Table 18. Information exchange and stakeholder involvement Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Ensuring the information exchange on POPs, between the FSM and region and international community | 1.1 Establishing a national procedure/mechanism to communicate national information on POPs with regional or international relevance to the regional Basel and/or Stockholm centres, the BRS Conventions Secretariat and other Parties | National Government POPs Program Coordinator | Information exchange on POPs, between the FSM and region and international community is ensured | January 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| **Objective #2:** Ensuring access to information on POPs related matters and documents for national stakeholders | 2.1 Permanently identifying and updating official DECCEM and state EPAs websites with latest information and documents published on BRS Conventions Secretariat website | National Government POPs Program Coordinator  FSM Stakeholders groups | Access to information on POPs related matters and documents for national stakeholders is ensured | March 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 2.2 Establishing criteria for selection of the BRS Conventions Secretariat documents/topics to be translated in local language | National Government POPs Program Coordinator  FSM Stakeholders groups  Departments of Education | June 2022 |
| **Objective #3:** Strengthening information exchange between stakeholders at national and state level | 3.1 Facilitating the dialogue between policy makers, industry, academia, research institutes and NGOs. | National Government POPs Program Coordinator  FSM Stakeholders groups | information exchange between stakeholders at national and state level is strengthened | September 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM. |
| 3.2 Improving dialogue between policy makers and science community for enhancing the informed decision-making on POPs matters. | National Government POPs Program Coordinator | September 2022 |

### 3.3.14 Activity: Public and stakeholder awareness, information and education (Article 10)

#### 3.3.14.1 Context and analysis of issue

In comparison to the other POPs substances, dioxins and furans constitute the most serious overall, public health threat to populations in the Federated States of Micronesia. The number of persons who come into contact with these two POPs is higher than the number of exposures to the harmful effect of pesticides, insecticides, and the newly listed unintentional POPs (or uPOPs).

In the FSM one of the top priority concerns in the area of safe chemical management is the lack of understanding and awareness among the general populace pertaining to the serious and potentially impending crisis nature of the local situation regarding the presence, and the probability of continued importation and production of hazardous wastes, including persistent organic pollutants (POPs). The unintentional, in-country production of two specific POPs, dioxins and furans, is of particular concern as it is the result of specific “innocent” behaviors which are practiced by many residents on a regular and frequent basis. The term “innocent” is used with reference to the fact that the vast majority of FSM residents who are involved with operating vehicles and other fossil fuel burning engines, and the burning of trash and other rubbish are not aware of the hazardous chemicals being released by the combustion process and the possible harmful exposure to family members, neighbours, and other people living in the vicinity or downwind of the source.

This lack of awareness presents a significant obstacle to effective concerted action to address the situation at the community, state, national, and international levels. Without such action, the country remains very susceptible to the public health and environmental problems caused by these toxic substances. Human morbidity and mortality due to direct exposure to toxic materials, and indirect exposure by consumption of contaminated food stuffs and/or water, or breathing polluted air, can place a considerable added, but cause un-associated, burden on the national health system. Due to the persistent nature of these substances to remain in the environment and in animal tissue for long periods of time, and the very minute amounts often involved, it is nearly impossible to identify a “cause and effect” relationship between the exposure to a toxic substance and an individual’s poor health outcome connected to that exposure. At the same time, the potential for contamination of off-shore oceans, reef and coastal marine environments, inland waterways and streams, soils, and the air, by hazardous wastes, including POPs, could result in food shortages and lead to possible economic ruin for important sectors of the local economy, including agricultural, fisheries (and other marine commodities), and tourism.

The FSM has been fortunate because no major, large scale health or environmental disasters caused by POPs or other dangerous chemicals have occurred in the country. Tragic disasters that have occurred in other countries, disasters which were caused by hazardous materials (including POPs), radioactive materials, or buried toxic wastes, have served to create a universal consciousness among the affected populations, sensitizing residents to these important health and environmental issues. The publicity surrounding these unfortunate events has increased the number of people who have concerns about POPs and other hazardous wastes, which in turn increases public influence on both government decisions and social behaviors.

The FSM, without such incidents and with limited media resources, faces the challenge of making the general public aware of the potential risks posed by the use and disposal of POPs and other hazardous substances. Given the relatively fragile nature of the small island environments and the critical dependence of populations on these environments for food and livelihoods, the government must not wait for a major catastrophe before undertaking a wide-ranging awareness building effort.

The POPs project has begun the awareness building effort, with initial efforts underway in each state, and the FSM national government providing resources and technical assistance. The strategy has been to follow a similar course of action as employed in other programs to propagate information to the public: community meetings, theme day programs, presentations at schools, and some limited media exposure. However, these campaigns that were begun following the first FSM POPs program were limited in scope, and did not develop into the long-term endeavors that must be undertaken to get sufficient information broadly dispersed to large segments of the population.

These existing approaches must be up-scaled and expanded to include additions to the school curriculum, more frequent community intervention activities, and greater mass media publicity. Certain POPs creating activities, which are seen as harmless by most individuals, must be targeted for special attention. In addition to the general public, specific vulnerable groups must be targeted to receive special information that is particularly relevant to their situations. For example, residents living near known sources of pollution should realize that they do have recourse to seek corrective actions, and that national and state laws should exist to protect them where they reside, and assist them to access necessary medical services. Legal support in this endeavor is an essential need. The EPA offices often are discouraged by that fact that violators of environmental laws and regulation are seldom successfully prosecuted. Law enforcement and legislative endorsement are one of the important vehicles to facilitate progress in the effective management of POPs and other hazardous wastes.

For populations living on the islands of the FSM, potential exposure to dioxins and furans are the result of emissions from five main sources:

• Smoke from the residential burning of rubbish in open fires;

• Exhaust from cars, trucks, motorcycles, outboard engines, etc.;

• Smoke from burning driftwood or plastic in cooking fires/barbeques;

• Smoke from the burning of municipal solid waste at dumpsites; and

• Exhaust from fuel powered electricity generating plants and other facilities.

In addition to awareness campaigns, there is a need to develop and enforce laws and regulations that will serve to reduce the emission levels from these sources. Practices and behaviours which for many years have been considered harmless must be discouraged by negative public attitudes and restrictive laws. By adopting priorities that will encourage a switch from fossil fuels to alternative sources of energy, eventually a near elimination of in-country production of dioxins and furans is possible.

The management of solid waste disposal is presently not well regulated and there are no up-dated national criteria in place to provide a framework for this control. Likewise emission measurement and control from power generating facilities is non-existent. External expertise may be needed to assist the local state and national governments to address both of these matters. The National Advisory Committee for POPs Chemical Management (NACPCM) will be responsible for developing the Terms of Reference for the consultants if needed to assist with these issues.

The POPs Task Forces, created after the initial FSM POPs program, are no longer functioning due to lack of financial support and a lack of public interest. These groups must be rejuvenated to get public awareness activities implemented and operating. It will take a long-term commitment of personnel and resources to develop a comprehensive, sustained awareness campaign to achieve proper changes in the general public’s attitudes and concerns about POPs and other hazardous wastes.

#### 3.3.14.2 Goals and objectives

The overall goal for this action plan is to increase the awareness of the general public in the Federated States of Micronesia about the health and environmental risks posed by POPs and other hazardous wastes. The dangers posed by dioxins and furans are to receive special attention in this effort.

The creation and on-going support for the FSM’s National Advisory Committee for POPs Chemical Management (NACPCM) is included in FSM Action Plan 3.3.12, which focuses on activities needed for Hazardous Waste Storage, Disposal, and Contaminated Site Clean-up. The NACPCM will serve as a source of available in-country expertise and will facilitate the ability of the FSM DECCEM to provide relevant and accurate information to the nation’s leadership regarding the development of legislation addressing all aspects of POPs and other hazardous substances management, including support for the development of a long-term public education and awareness program, including specific actions to reduce dioxin and furan emissions.

There are seven specific objectives listed in this action plan to reach this goal.

1. To establish, by 30 June 2021, within the FSM’s National Advisory Committee for POPs Chemical Management (NACPCM), a standing committee called the “Hazardous Waste Awareness Program Working Group” (HWAPWG), consisting of selected members of the NACPCM from appropriate state and national level government offices (including the Departments of Education, Health, and Public Information), the private sec-tor, and representatives from non-government organizations. The function of the HWAPWG is to suggest topics and preview all public awareness activities prior to implementation.

2. To designate, by 30 June 2021, a “State POPs Public Awareness Program Manager” to run the awareness program in each state.

3. To develop, by December 2021, a collection of accurate, up-to-date POPs information to be utilized as a basis to create the awareness messages included in the various formats listed in objectives #4, #5 and #6 below.

4. To publish, beginning in December 2021, a POPs newsletter (printed and electronic) on a quarterly basis, in each FSM state.

5. To develop by December 2021, programs to utilize World Environmental Day, and other similar theme days, to promote POPs awareness; and by 31 December 2022, to have conducted a series of six (6) community presentations/workshops per year, in each state, addressing the public’s role to address the problems associated with POPs and other hazardous wastes. Repeat in 2023 and 2024.

6. To develop, by December 2022, a National Solid Waste Policy with the specific aim to reduce in-country production of dioxins and furans. The policy will provide strategies to address and manage emissions from all potential sources.

7. To integrate, in 75% of schools nation-wide during the 2022/2023 school year, a POPs and other hazardous wastes awareness curriculum into the nation’s school system with appropriate course materials for preschool to grade 12 students; and to expand the curriculum to 95% of all schools by school year 2024/2025.

#### 3.3.14.3 Relevant management options

The creation of the HWAPWG is an option to augment the existing expertise in efforts to ad-dress these tasks, increase coordination, and provide additional input from the community level. The inclusion of representatives of the private sector and NGOs (such as conservation societies, women’s groups, youth groups, faith based organizations, and service clubs) can serve to enhance and extend “coverage”, while also permitting vulnerable groups to be represented and to receive appropriate attention.

This action plan, targeting an increase of awareness about POPs and other hazardous wastes among the general public and identified vulnerable groups in the FSM, will involve a variety of approaches. The objectives listed above will involve a significant amount of effort from those state and national employees tasked with organizing and implementing the various activities. The national government POPs and Environmental Health Programs and state EPA Offices will be tasked with providing technical assistance to the HWAPWG. If necessary, consultants can be recruited to assist with development of informational resources for the various mass media outlets and the school curriculum materials. Computer/printer systems and publishing software will be needed, as well as Internet connectivity capacity, and the projection equipment necessary to perform presentations to communities and large audiences.

There are other options to take advantage of the various existing “theme days” such as Earth Day (22 April) and also to create new “days” to supply opportunities to bring together large numbers of people to learn about POPs and other hazardous wastes issues. Presentations can take many different approaches: videos can be shown, printed materials can be distributed, and other activities can be utilized to draw crowds. Community “Clean-up Days” present similar opportunities.

The internet also provides a number of awareness building possibilities for the general public and for use in schools and other organizations.

The various kinds of POPs and other hazardous waste information that is disseminated to the public would need to be adapted to the target audiences, and cover a wide range of topics from general information about the types of POPs and other hazardous wastes that may be found in the FSM, to particular guidelines on the reduction of dioxin and furan production. Information sharing targeted at specific groups would need specific transfer approaches, such as workshops or on-the-job trainings. Translation into local languages will be necessary for materials to be distributed to any audiences not possessing adequate capacity to under-stand materials produced in English.

The NACPCM will help to coordinate this endeavour to ensure that all of the necessary aspects are included including appropriate legislation. At the time when regulations limit open residential burning, there will need to be the capacity to enforce such regulations, and acceptable and affordable options available for residents to safely and legally dispose of their rubbish. There are now accurate measurement tools available to determine emission levels from vehicles and power plants.

Reporting requirements relevant to the project will need to be established. Quantitative measurements would indicate numbers of educational items produced, total distributed, and further details about the distribution process, such as the type of event and number of participants. Qualitative measurements could be accomplished by baseline and follow-up surveys. School curriculum materials would include evaluations of the effectiveness of the education-al programs. Upon the creation, and effective enforcement, of laws and regulations intended to control illegal activities regarding POPs and other hazardous wastes, trends in the number and types of citations issued may give an indication of compliance, and indirectly, of public awareness levels.

Training of local teachers regarding the instructional activities in the POPs curriculum will be an essential requirement and training for other community presenters may be necessary as well. The National POPs Program Coordinator, the state counterparts, and HWAPWG will work in conjunction with the state and national Departments of Education to coordinate and implement these training activities.

To effectively address the issue of in-country dioxin and furan production, it will be necessary to conduct a survey to identify all potential sources of these substances. Professional expertise and measuring equipment not presently available in the FSM may be necessary. If a consultant is recruited for this work, upon completion of the survey, the consultant can be utilized to facilitate a National Workshop aimed at developing a plan to reduce in-country dioxin and furan production. The creation of a National Solid Waste Management Policy will be one of the main components of the reduction effort and a deliverable outcome of the workshop session.

The National Solid Waste Management Policy will provide the groundwork for legislation directly regulating dioxin and furan emissions from all sources, it can also regulate other related activities which will indirectly influence and promote reduced emissions of these substances. These laws would include, but would not be limited to, the following issues:

* The provision of economic incentives to reduce reliance on fossil fuels;
* The establishment of emission standards for all industrial exhausts (including power generating plants), the creation of measurement procedures, and enforcement actions;
* The creation of specific standards of operation for sanitary landfills/dumpsites, and stronger efforts to regulate illegal dumping/littering;
* The establishment of properly operated incinerators in all states;
* A ban on all open fires including domestic rubbish burning and purposely set fires for the clearing of land;
* The establishment of emission standards for all vehicles, the creation of measurement procedures, and enforcement actions.

#### 3.3.14.4 Criteria for evaluation and prioritization of options

The FSM DECEM will be the lead agency for this project, with the National POPs Program Coordinator in collaboration with the State EPA Offices, responsible for coordination and implementation. The NACPCM and HWAPWG groups will be in the best position to guide the National POPs Program Coordinator and state EPA staffs on the best alternatives available to complete the activities included in this project.

Decisions to implement specific activities and projects at the state or national level must be determined by careful consideration of the cost-effectiveness and the focus of the effort. National level responsibilities will need to address coordination, information management and sharing, and arranging external contacts for consultants or other specialized technical assistance. State level tasks would involve presentation design and performance, production of mass media items, and interface systems to provide and collect information to and from the general public.

If the NACPCM and the FSM Departments of Education determine that additional assistance is needed to complete the varied tasks involved with this work plan, a consultant with expertise in the area of curriculum development may be necessary. Consultants involved with other work plans may also be able to assist here.

#### 3.3.14.5 Action plan implementation strategy

The National POPs Program Coordinator and the HWAPWG, during their coordinating meetings, will direct and monitor the activities scheduled for this Public Awareness project. The scheduling of the activities for this project may be accelerated if objectives are completed ahead of the suggested timeline, and if funds are available, to move on to the next step.

The basic approach for this project is to first establish a coordinating group (the HWAPWG) within the NACPCM and with members representing a wide range of the various stakeholders in the FSM society, and then proceed to develop and implement a number of activities, including the utilization of mass media resources, which will bring the POPs and other hazardous wastes awareness messages to the public in general. More targeted activities can be directed at children in school or specific vulnerable populations. Some of the materials will be de-signed to deliver the messages particularly to the different levels of political leadership and also to traditional leaders. Since each day that passes brings the FSM’s potential POPs and/or other hazardous waste tragic disaster closer, it is important to begin the awareness effort as soon as possible. To this end, the early media releases and newsletters may be general, or introductory, in nature, perhaps relatively simple and short, but emphasizing certain compelling and urgent aspects of the issue, such as the necessity for prompt action on the part of the political leaders in developing enabling legislation.

A “clearinghouse” scheme will be established to permit a flow of information both to and from the general public. It will be a source of accurate, up-to-date facts about POPs and other hazardous wastes, and will provide information about the situation in the FSM. It will also serve as a resource to which individuals or groups can report POPs and other hazardous waste related problems and issues.

The action plan pertaining to each of the numbered objectives above is as follows.

**Table 19. Public and stakeholder awareness, information and education Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Increasing the POPs awareness of the general public | 1.1 Conducting nation-wide survey to determine level of awareness in the general population about POPs, other hazardous substances, and the negative health issues that may arise following exposures to these chemicals. | National Government POPs Program Coordinator, NACPCM, and State EPA Staff | Satisfactory progress in surveying knowledge levels about POPs and other hazardous substances at the community level in each of the FSM states, and inclusion of awareness building efforts to be included in the educational activities. | December 2021 | Resource Needs (2021):  NG POPs Program Coordinator  EPA Office staff  Resource Needs (2022):  NG POPs Program Coordinator  EPA Office staff |
| 1.2 Using the information gathered from this survey, to augment the educational content for the activities for increasing awareness in the FSM’s communities. | National Government POPs Program Coordinator, NACPCM, and State EPA Staff | November 2022 |
| **Objective #2**: Establishing, by 30 June 2021, within the FSM’s National Advisory Committee for POPs Chemical Management (NACPCM), a standing committee called the “National Hazardous Waste Awareness Program Working Group” (HWAPWG), consisting of members of the NACPCM with from Departments of Education, Health, and Public Information and others. | 2.1 Developing draft Terms of Reference for the HWAPWG membership, as a working group within the NACPCM. | National Government POPs Program Coordinator | Satisfactory progress drafting HWAPWG Terms of Reference, formalization of HWAPWG as a standing committee in the NACPCM, and meetings conducted. | 30 June 2021 | Resources Needs (2021): NG POPs Program Coordinator)  Resources Needs (2022, 2023, 2024):  NG POPs Program Coordinator |
| 2.2 Organizing and convening HWAPWG sessions in conjunction with scheduled NACPCM meetings for 2022, 2023, 2024. | NACPCM and National Government Pop’s Program Coordinator |  |
| **Objective #3**: Designating, by 31 July 2021, a “State POPs Public Awareness Program Manager” in each state. | 3.1 Identifying the “State POPs Public Awareness Program Manager”, the individual in each state responsible for developing, organizing, and implementing the various activities of the POPs Awareness Program. | State EPA Offices select staff, National Government POPs Program Coordinator develop TORs and selection criteria | Satisfactory progress, as per schedule, in identifying qualified individual to fill the position in each state. | 31 July 2021 | Resources Needs (2021, 2022, 2023, 2024): NG POPs Program Coordinator  State EPA Offices staff |
| **Objective #4**: Developing, by December 2021, a collection of accurate, up-to-date POPs information to be utilized as a basis to create the awareness messages included in the various formats listed in objectives #5, #6 and #7 below. | 4.1 Compiling the list of reference materials as sources of accurate and current POPs information. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager, in consultation with HWAPWG | Satisfactory progress, as per schedule, in identifying staff, creating resource and topics lists, and conducting workshop. | June to September 2021 | Resources Needs (2021): NG POPs Program Coordinator  State EPA office staff  Resources Needs (2022): $23,000 |
| 4.2 Creating lists of potential topics to be used in Awareness Program. Special attention is to be given to reduction of in-country production of dioxins and furans. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager, in consultation with HWAPWG | September to December 2021 |
| 4.3 Conducting workshop to develop materials to be utilized in Awareness Program activities identified in Objectives #3, #4, and #5. | National Government POPs Program Coordinator and State POPs Public Awareness Program Manager. Funds are budgeted for a consultant to function as a workshop facilitator. | November 2022 |
| **Objective #5**: Publishing, by December 2021, a POPs newsletter (printed and/or electronic) on a quarterly basis, for FSM-wide distribution. | 5.1 Identifying the “State POPs Newsletter Publisher,” the individual in each state who will be responsible for newsletter activities. | State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with HWAPWG). It is anticipated that the State POPs Public Awareness Program Manager will fill this position; however state EPA Offices may decide to have more than one individual working on the POPs Public Awareness program | Satisfactory (as scheduled) progress in identifying state level individuals for POPs Newsletter Publisher position, procurement of computer equipment and related sup-plies, distribution list created, first and subsequent issues produced, in hard copy and electronic, on a regular basis. | 30 June 2021 | Resources Needs (2021): $22,000  Resources Needs (2022, 2023, 2024): $24,000 |
| 5.2 Identifying and procuring needed computer equipment (computer, scanner, printer, cam-era), publishing software, and related supplies for each state. | National Government POPs Program Coordinator, in consultation with State EPA Offices | 31 August 2021 |
| 5.3 Developing newsletter electronic and hard-copy distribution list - include all municipal, state, and national level leaders, all schools, NGO’s, and other interested parties, copies to be available to the general public and select articles to be included in local newspapers when possible . | State EPA Offices, in consultation with HWAPWG | 31 August 2021 |
| 5.4 Collecting information and photos, compose articles, design layout, transmit electronic copies, print and distribute hard-copies | State POPs Newsletter Publisher in each state, content/editorial advice to be provided by State EPA Offices and the HWAPWG | 30 November 2021 |
| 5.5 Evaluating operation and adjusting as necessary. Subsequent issues could be published in only online format, per a quarterly, or semi-annual, schedule. | State POPs Newsletter Publisher in each state, content/editorial advice to be provided by State EPA Offices and the HWAPWG. | on-going, beginning in January 2022 until December 2024 |
| **Objective #6**: Developing, by December 2021, programs to utilize World Environmental Day, and other similar theme days, to promote POPs awareness; and by 31 December 2024, have conducted two (2) community presentations/workshops per year, in each state. Topic should address the public’s role in resolving the problems associated with POPs and other hazardous wastes. | 6.1 Identifying the “State POPs Information Officer” the individual in each state who will be responsible for organizing Theme Day presentations. | State EPA Offices select staff, National Government POPs Program Coordinator develop selection criteria in consultation with NHWAPWG). It is anticipated that the State POPs Public Awareness Program Manager will fill this position, however state EPA Offices may decide to have more than one individual working on the POPs Public Aware-ness program activities. | Satisfactory (as scheduled) progress in identifying state level individuals for POPs In-formation Officer position, procurement of computer equipment and related supplies, lists and calendar created, presentations designed and performed | 30 June 2021 | Resources Needs (2021): $32,000  Resources Needs (2022, 2023, 2024): $48,000 |
| 6.2 Identifying and procuring needed computer equipment (computer, scanner, printer, cam-era, LCD Projectors), publishing software, and related supplies for each state. | POPs Information Officer, National Government POPs Program Coordinator, in consultation with State EPA Offices | 31 August 2021 |
| 6.3 Developing “Theme Day” calendar of events, include all municipal, state, and national level dates of events that present opportunities for sharing information, identify three per state. | State POPs Information Officer, in consultation with HWAPWG | 30 December 2021 |
| 6.4 Collecting information, photos, graphics, etc. and design twelve presentations appropriate for community meetings, including three presentations for larger, general audiences. Completed presentations will be shared among states. | State POPs Information Officer in each state and HWAPWG | 31 December 2021 |
| 6.5 Performing two of the prepared presentations in each state per year. | State POPs Information Officer and EPA staff | 31 March 2022 and then on-going in 2023 and 2024 |
| **Objective #7**: Integrating, in 75% of schools nation-wide during the 2022/2023 school year, a POPs and other hazardous wastes awareness curriculum into the nation’s school system with appropriate course materials for preschool to grade 12 students. Increase to 95% of all schools by school year 2024/2025. | 7.1 Identifying the “National POPs Curriculum Development Coordinator” and members of the “POPs Curriculum Development Task Force” (POPCDTF), the group comprised of representatives of the national and state Departments of Education and members of the HWAPWG, who will oversee the development of POPs curriculum | National Government POPs Program Coordinator in consultation with HWAPWG | Satisfactory (as scheduled) progress in identifying National POPs Curriculum Development Coordinator, POPCDTF members, recruiting technical assistance, procurement of needed curriculum development related equipment and supplies, Completion of draft curriculum, procurement of instructional aids, completion of pilot testing and review process, teacher training, curriculum being taught in percentage of schools nation-wide | 30 June 2021 | Resources Needs (2021): $71,500  Resources Needs (2022): $89,000  Resources Needs (2023): $38,000  Resources Needs (2024): $35,000 |
| 7.2 Recruiting technical assistance (consultant/curriculum writer) for POPs curriculum de-sign. | National Government POPs Curriculum Development Coordinator, in consultation with POPCDTF | 31 August 2021 |
| 7.3 Identifying and procuring the equipment/materials needed for curriculum development (computer system, related software, peripheral equipment) and related supplies. | National Government POPs Curriculum Development Coordinator | 30 September 2021 |
| 7.4 Developing Draft POPs Curriculum; call and conduct POPCDTF meetings, as necessary, to facilitate successful curriculum development efforts, including publishing or procurement of instructional texts, equipment, and materials. | POPs Curriculum Development Coordinator and POPCDTF | 31 July 2022 |
| 7.5 Reviewing, pilot testing, and revising of POPs Curriculum. | POPs Curriculum Development Coordinator, POPCDTF, and State Departments of Education | 31 October 2022 |
| 7.6 Procuring of all instructional texts, equipment, and materials for finalized POPs curriculum. | POPs Curriculum Development Coordinator and POPCDTF | 31 March 2023 |
| 7.7 Holding state level Training Workshops to familiarize school teachers with POPs Curriculum. | POPs Curriculum Development Coordinator, POPCDTF, and State Departments of Education | 31 August 2023 |
| 7.8 Teaching POPs Curriculum in 85% of all schools in the FSM by 31 December 2023, and 95% of all schools in the FSM by 31 December 2024. | POPs Curriculum Development Coordinator, POPCDTF/HWAPWG, and State and National Departments of Education | 85% of all schools in the FSM by 31 December 2023, and 95% of all schools in the FSM by 31 December 2024 |

### 3.3.15 Activity: Effectiveness evaluation (Article 16)

#### 3.3.15.1 Context and analysis of issue

In accordance with the Article 16 of the Stockholm Convention the FSM should assess whether the Stockholm Convention is an effective tool to protect human health and the environment from persistent organic pollutants.

#### 3.3.15.2 Goals and objectives

The goal and objective of this action plan is to set up a framework at national and states levels to conduct effectiveness evaluation.

#### 3.3.15.3 Relevant management options

Evaluating effectiveness evaluation in practice happens through evaluating in the FSM whether:

* Releases from intentional production and use are eliminated or reduced;
* Releases from unintentional production are eliminated or reduced;
* Releases from stockpiles and wastes are eliminated or reduced; and
* Environmental levels of POPs are decreasing over time.

#### 3.3.15.4 Criteria for evaluation and prioritization of options

Criteria for evaluation and prioritization of options referred to selecting those measures to follow the POPs life-cycle.

#### 3.3.15.5 Action plan implementation strategy

The first step in this action plan’s implementation strategy will be to establish an on-going surveillance methodology to measure the effectiveness of the implementation of the Stockholm Convention in the FSM. This effort will require the determination of criteria, the creation of evaluation teams, and the establishment of an internal transmittal route in the FSM, which then leads to the Convention Secretariat.

Step 2 for this action plan concerns the completion of a Quality Audit of all NIP activities related to any of the chemical life-cycle of POPs chemicals. The audit results will be reported in a format that permits identification of success and failures of the activity, and will be distributed to all of the stakeholders and other interested parties. Strategies to address gaps and enhance strengths of the program will be determined and a report of the activity will be forwarded to the Convention Secretariat.

**Table 20. Effectiveness evaluation Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1:** Setting up national framework to conduct effectiveness evaluation of Stockholm Convention implementation in the FSM at periodic intervals | 1.1 Developing national performance evaluation criteria of Stockholm Convention implementation in the FSM (inspired from the international process of effectiveness evaluation of Stockholm Convention) | National Government POPs Program Coordinator  FSM Stakeholders Group | National framework to conduct effectiveness evaluation of Stockholm Convention implementation in the FSM at periodic intervals is set | January 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 1.2 Setting-up a multi-disciplinary team to conduct the audit and evaluate effectiveness | National Government POPs Program Coordinator  FSM Stakeholders Group | February 2024 |
| 1.3 Define an internal procedure on informing the Stockholm Convention Secretariat on the national effectiveness evaluation conducted | National Government POPs Program Coordinator  FSM Stakeholders Group | March 2024 |
| **Objective #2**: Auditing all aspects of POPs life cycle: importation, storage, use, clean-up, and disposal procedures to discover any gaps in the procedures/ implementation of NIP. | 2.1 Completing a Quality Audit of all actions and activities included in the NIP Action Plans, determining if goals and objectives were achieved. | National Government POPs Program Coordinator  FSM Stakeholders Group  State EPA offices | Satisfactory progress in final confirmation that all contaminated sites have been eliminated and no POPs exposure is possible. Final confirmation report is submitted. | June 2024 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM  Resource Needs (2024):  NG POPs Program Coordinator |
| 2.2 Compiling a report which identifies the successes and failures of the NIPs implementation, indicating the reasons for the successes and the causes that prevented activities from being completed satisfactorily. | National Government POPs Program Coordinator, NACPCM  FSM Stakeholders Group  State EPA offices | December 2024 |
| 2.3 Informing relevant stakeholders on the findings of the audit and deciding next actions to address the gaps and enhancing and strengthening effectiveness of the implementation | National Government POPs Program Coordinator  FSM Stakeholders Group |  |
| 2.4 Informing the Stockholm Convention Secretariat on the national effectiveness evaluation conducted in the FSM | National Government POPs Program Coordinator  DECEM Office |  |

### 3.3.16 Activity: Reporting (Article 15)

#### 3.3.16.1 Context and analysis of issue

The Article 15 national report contains information on the measures taken by FSM in implementing the Stockholm Convention. The information provided in the national reports is one of the main references to be used for the evaluation of the effectiveness of the Convention in accordance with its Article 16 including the progress towards the elimination of polychlorinated biphenyls (PCBs).

The Conference of the Parties (COP) decided at its first meeting that national reports shall be submitted every four years. In order to enable the interpretation and comparison of trends, it is important that Parties complete their national reports in a timely and accurate manner. Each Party designates an Official Contact Point who has the authority to submit a national report to the Secretariat.

#### 3.3.16.2 Goals and objectives

The goal and objective of this action plan is to set up a national mechanism to ensure future timely reporting for the FSM to the Stockholm Convention Secretariat.

#### 3.3.16.3 Relevant management options

Through the report, the FSM shall provide to the Secretariat:

* Statistical data on its total quantities of production, import and export of each of the chemicals listed in Annex A and Annex B or a reasonable estimate of such data; and
* To the extent practicable, a list of the States from which it has imported each such substance and the States to which it has exported each such substance.

#### 3.3.16.4 Criteria for evaluation and prioritization of options

The criteria for evaluation and prioritization of option took into account setting those measures to ensure the reporting of the required information to the Conference of the Parties by the FSM on the measures it has taken to implement the provisions of this Convention and on the effectiveness of such measures in meeting the objectives of the Convention.

#### 3.3.16.5 Action plan implementation strategy

The first step in this action plan’s implementation strategy will be to establish an internal FSM system for coordinating the process by which the FSM will compile state and national level data needed to complete the obligatory Article 15 report to the Stockholm Convention Secretariat. To this end, both national and states will teams will be created and trained to conduct collection, compilation, and validation of the data needed for completing the report. Teams will be involved in the FSM’s various POPs activities so that members remain up-to-date with regards to POPs efforts in the FSM and its four states.

The final step intis action plan will be to conduct the activities mentioned in step one above: identifying data sources and the specific indicators to be measured, determining collection methodology, actual visits to sources for the collection effort, compiling and verifying the collected data, writing of a draft report to be circulated for endorsement, and finally transferring the report information to the BRS system for final submission.

**Table 21. Reporting Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Setting up a national mechanism/procedure to report under Article 15 | 1.1 Developing internal procedure for coordinating the reporting process at national and states level. | National Government POPs Program Coordinator  FSM Stakeholders groups | A national mechanism/procedure to report under Article 15 is set up | January 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 1.2 Defining multi-disciplinary teams at national and states levels and their responsibilities for data collection, compilation, and validation and completing the reporting form. | National Government POPs Program Coordinator  FSM Stakeholders groups | March 2022 |
| 1.3 Providing periodically training of the national and states levels teams on data needs, reporting formats and BRS Electronic Reporting System. | National Government POPs Program Coordinator  FSM Stakeholders groups  State EPA Offices | June 2022, 2023, 2024 |
| 1.4 Involve the reporting team in any action/activity related to NIP update and implementation, to understand the interlinkages between reporting and NIP. | National Government POPs Program Coordinator  FSM Stakeholders groups  State EPA Offices | June 2022  (and on-going) |
| **Objective #2:** Collecting, compiling, validating the requested data and information, and completing and submitting national report under Article 15 to Stockholm Convention Secretariat | 2.1 Identifying data and information to be collected and potential data sources | National Government POPs Program Coordinator  State EPA Offices | Requested data and information in the national report under Article 15 is collected, compiled, validated, completed and submitted to Stockholm Convention Secretariat | September 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 2.2 Collecting data and information and determine the compilation methods. | National Government POPs Program Coordinator  State EPA Offices | November 2022 |
| 2.3 Compiling and validating the data and information. | National Government POPs Program Coordinator  State EPA Offices | February 2023 |
| 2.4 Completing the reporting format and obtain internal approval for submission. | National Government POPs Program Coordinator | April 2023 |
| 2.5 Transferring the completed data and information into the BRS Electronic Reporting System. | National Government POPs Program Coordinator | April 2023 |

### 3.3.17 Activity: Research, development and monitoring (Article 11)

#### 3.3.17.1 Context and analysis of issue

Article 11 of the Stockholm Convention mandates Parties to undertake appropriate research, development, monitoring and cooperation pertaining to POPs. The research and monitoring of POPs and chemicals in general play a crucial role for informed decision and policy making. Strengthening of science-policy interface is a global endeavor towards which the FSM could play a role by taking measures to enhance its own at national level.

The overall research and monitoring capacity on POPs in the FSM is low, efforts are not coordinated and the development of analytical capacity in the country is a major bottleneck. Personnel in each of the four states now have the capacity to test for PCBs, but not for all POPs and other hazardous substances. For other substances, different kits and associated trainings will be needed. External expertise will be necessary to provide this training and also assist with identification as necessary. Local (in-country) laboratory capacity is not sufficient to test and identify most POPs and other hazardous substances, thus the assistance of out-of-country laboratory services is necessary. For some identification and testing work, the FSM will have to rely on expatriate services which provide a more cost efficient option. In some circumstances, to develop the capacity of a local laboratory to conduct an expensive test which is performed only occasionally is not an efficient use of financial resources.

#### 3.3.17.2 Goals and objectives

The goal and objective of this action plan is to strengthen the research, development and monitoring on POPs in the FSM.

#### 3.3.17.3 Relevant management options

For POPs research and monitoring, international cooperation with experienced institutions should be further promoted and better coordinated. In this respect, capacity building activities offered in the frame of the Stockholm Convention such as the Global Monitoring Plan should be explored and supported from the FSM side.

#### 3.3.17.4 Criteria for evaluation and prioritization of options

The prioritization of option was based on the gaps identified during the POPs inventories in the FSM.

#### 3.3.17.5 Action plan implementation strategy

This action plan’s goal is to address the lack of national capacity to manage POPs and other chemicals in the country. The possible pathways for capacity building include the involvement of local institutions, such as the College of Micronesia-FSM, to provide training. This would also include the strengthening of the research capacity at the College. The identification and cooperation of regional and international organizations or networks that can exchange relevant POPs information will be established. Research results will be shared with policy makers and stakeholders to enable information-based decision making. Research results will also be shared with the general public via appropriate media outlets.

The second part of this action plan addresses the development of analytical capacity in the FSM, which will align with international recognized guidelines. As above, laboratory strengthening is a major component, as any quality assurance efforts will depend upon this capacity. Once capacity exists, procedures for quality control and assurance will be established. As reports are generated, a monitoring system will need to be created so that quality issues as identified by the states can be resolved.

**Table 22. Research, development and monitoring Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Building institutional and research capacity to manage POPs in the FSM | 1.1 Identifying institutions at national or states level with the potential to undertake research into POPs | National Government POPs Program Coordinator  FSM Stakeholder groups | Institutional and research capacity to manage POPs in the FSM is built | January 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM. |
| 1.2 Strengthening national scientific and technical research capacity and infrastructure to gather, evaluate and exchange information on POPs and other relevant chemicals | National Government POPs Program Coordinator  Select educational facilities in the nation | March 2022 |
| 1.3 Building knowledge regarding health, exposures, and risk assessment for POPs and other relevant chemicals | National Government POPs Program Coordinator | May 2022 |
| 1.4 Setting up national, regional and international networks to exchange information on POPs and other relevant chemicals research findings | National Government POPs Program Coordinator | July 2022 |
| 1.5 Ensuring tailored communicating messages to the public on research and development findings | National Government POPs Program Coordinator | July 2022 |
| 1.6 Strengthening the dialog between policy makers and research institute for informed decision-making on POPs and other relevant chemicals | National Government POPs Program Coordinator | September 2022 |
| **Objective #2:** Building the capacity for monitoring the POPs action plans implementation | 2.1 Assessing the FSM analytical capacity need | National Government POPs Program Coordinator  State EPA Offices | Capacity for monitoring the POPs action plans implementation is built | October 2021 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 2.2 Developing laboratory capacity and/or international cooperation for POPs and other hazardous chemicals considered relevant for the country, including establishing effective quality assurance and quality control system | National Government POPs Program Coordinator  State EPA Offices | January 2022 |
| 2.3 Setting up quality assurance and quality control system of the monitoring data | National Government POPs Program Coordinator  State EPA Offices | January 2022 |
| 2.4 Developing procedures for the management of analysis results and other data, considering internationally recognized guidelines for data generation and interpreting monitoring results and presenting monitoring reports | National Government POPs Program Coordinator  State EPA Offices | March 2022 |
| 2.5 Support the monitoring needs of the action plans of the individual POPs groups | National Government POPs Program Coordinator  State EPA Offices | June 2022 |

### 3.3.18 Activity: Technical and financial assistance (Articles 12 and 13)

#### 3.3.18.1 Context and analysis of issue

The FSM needs technical and financial assistance and will seek this assistance when implementing its NIP.

#### 3.3.18.2 Goals and objectives

The goal and objective is to enable the FSM obtain the needed financial and technical support required for the successful implementation of activities and actions to be carried out to achieve the Stockholm Convention overall objective or protecting human health and environment against POPs.

#### 3.3.18.3 Action plan implementation strategy

This action plan addresses the need to secure external technical and financial assistance to support the FSM’s on-going NIP activities. The first step is to determine a hierarchy of the needs so that the top priority POPs related issues receive the most urgent attention.

The identification of sources for technical and financial assistance and the preparation of national proposals to capture this assistance is the next step. Careful examination of grant conditions and details is necessary.

The final step in this action plan will be the writing and submission of proposals to capture technical and financial assistance for the FSM’s on-going POPs related activities.

**Table 23. Technical and financial assistance Action Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Objective** | **Activities** | **Responsible** | **Performance indicator** | **Timelines** | **Resource needs** |
| **Objective #1**: Prioritizing the technical and financial assistance needs under NIP | 1.1 Setting up criteria for prioritization of technical and financial assistance needs | National Government POPs Program Coordinator | Technical and financial assistance needs under NIP are prioritized | September 2021 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| 1.2 Applying the criteria and make the prioritization list | National Government POPs Program Coordinator | November 2021 |
| **Objective #2:** Identifying potential sources of technical and financial assistance | 2.1 Conducting an assessment of potential financial and technical assistance sources/donors, including on the conditions applying in getting the assistance | National Government POPs Program Coordinator | Potential sources of technical and financial assistance are identified | January 2022 | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |
| **Objective #3:** Attracting technical and financial assistance on priority areas for POPs management in the FSM | 3.1 Writing proposals for receiving technical and financial assistance on priority areas for POPs management in the FSM | National Government POPs Program Coordinator | Technical and financial assistance on priority areas for POPs management in the FSM is attracted | January 2002  (On-going) | Activities can be incorporated into tasks performed by the National Government POPs Program Coordinator at DECEM |

## 3.4 Development and capacity-building proposals and priorities

The FSM’s highest priority areas where current capacity and capability need to be strengthened to achieve the objectives of the NIP are as follows:

* Capacity and Awareness Building among project stakeholders and management
* Capacity and Awareness Building with regards to importation, storage, use and disposal issues
* Capacity and Awareness Building with regards to identification issues by product sellers/users and the general public
* Long term training for potential candidates for management positions for POPs and other Hazardous Waste Control programs at the state and national levels
* Final decontaminations of former POPs locales in the nation
* Establishment of comprehensive surveillance systems to collect information for local needs and for reporting to regional and international organizations

# References

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Florin Mihai, Maria-Grazie Gnoni, Christia Meidiana, Chukwunonye Ezeah, Valerio Elia (2019). Waste Electrical and Electronic Equipment (WEEE): Flows, Quantities, and Management-A Global Scenario. Electronic Waste Management and Treatment Technology, 2019, ff10.1016/B978-0-12-816190-6.00001- 7ff. ffhal-02276468f

South Pacific Regional Environmental Program – Website: sprep.org

# Annexes

# ANNEX 1 - Information related to the - Stakeholder Groups

Requests were sent from the National POPs Program Coordinator at DECEM in early 2020 to each of the four FSM state directors of EPA (KIRMA in Kosrae) introducing them to the POPs up-date project and requesting their assistance in the planning and implementation phases.

One of the requested items to each director involved the creation of a state level stakeholder group to provide program input and oversee the POPs activities in each state. During the visit to Kosrae, discussions were undertaken to gather stakeholders representing all sectors that could possibly be involved in some phase of the up-dating effort: government, construction, power generation, transportation, agriculture, education, waste management, health services, etc. Guidelines were provided for the selections of members.

In each state there have been efforts taken by a small core group to establish a state level group with about 15 members. Due to the fact that many FSM citizens were caught unawares of the restrictions on air travel, these individuals were not available to be invited. Thus the final full membership of these groups has not yet been completed, and the official status of each group is still in process.

The following list indicates all of the individuals who will be requested to join, but not all have responded as of the date of the submission of this report.

State Stakeholders Listing







# ANNEX 2 - POPs Awareness Messages

POPs Awareness Message #1

**What are Persistent Organic Pollutants (POPs)**

**and why are they a problem**

**for the people living in the Federated States of Micronesia?**

Persistent Organic Pollutants, often referred to as “POPs”, are twelve of the most toxic (poisonous) chemicals which have been determined by science and medical experts at the United Nations (UN) to be a significant public health hazard on a world-wide scale. These twelve chemicals are linked to a variety of health problems in both humans and animals, including: cancers and tumors, cardiovascular (heart) disease, diabetes, infertility (inability to have children), birth defects, learning disorders, and a weakening of the immune system (which makes it easier for a person to become ill and harder to get better). By the word “linked” scientists mean that, in some cases it is definitely proven that some of these chemicals are the causes of certain diseases, and in some cases, it is believed that the disease is caused by a certain chemical, but it has not yet been definitively proven. Terms with a similar meaning to “linked” are “associated with” and “related to”. Because it may take only a very, very small amount of a POPs chemical to make a person sick, and the sickness may not appear until years after the chemical has entered a person’s body, sometimes it is very difficult for scientists and doctors to be absolutely certain that a specific POPs chemical is the cause of a specific symptom or disease.

Almost all of these POPs chemicals are man-made, but two are the unintentional by-products of combustion (burning) and other industrial processes. Today, POPs are found everywhere and in every living thing. They are present in the Earth’s environment (in the air, the water, and the soil) and in every living person and many animals. There are actually thousands of these man-made chemical substances in existence today, and many of them are essential to the standard of living that many people in the modern world enjoy. These chemical substances are found in many of the products that we use everyday, and the vast majority of them are believed to be completely safe. However, scientists have determined that a few of these substances are extremely dangerous to human health and the environment. The use of these dangerous POPs chemicals needs to be reduced, and eventually discontinued.

Some of the POPs substances were first created in the early 1900’s and have been in use for nearly 80 years. But the disturbing information about some of the POPs chemicals being unsafe is relatively new. Twenty to thirty years ago it was not known that some of these chemicals were so dangerous to human health, the health of animals, or the environment. The information about the movement of these POPs chemicals in the environment, their long-lasting nature, and that very tiny levels of exposure were very dangerous, was not understood at all. However, as the information about different groups of people who developed cancers and other diseases, started to be analyzed, the doctors and scientists began to suspect that certain chemicals were causing the health problems. One of the best known examples of groups of people who became sick because of POPs substances were the soldiers who fought in the Vietnam War and who were exposed to “Agent Orange”, a substance used to defoliate (remove leaves from the trees) the jungle to prevent enemy soldiers from having places to hide. After returning home, many of these soldiers suffered from various illnesses as a result of their exposure. Another example of people who became sick because of POPs substances were those families who lived in neighborhoods where a substance called DDT was sprayed to eliminate mosquitoes and other insects. The nervous systems of people in these areas were affected by the chemicals, causing excitability, tremors, and seizures. Women had increased changes of having a premature baby, and their breast-milk dried up after an unusually short period of time and while their babies were still nursing. Agent Orange and DDT contain POPs chemicals.

The twelve POPs chemicals are: 1) aldrin, 2) chlordane, 3) DDT (dichlorodiphenyltrichlorethane), 4) dieldrin, 5) endrin, 6) heptachlor, 7) mirex, 8) toxaphene, 9) HCB [hexachlorobenzene], 10) PCBs [polychlorinated biphenyls], 11) dioxins, and 12) furans. The first eight POPs are pesticides, which were first developed to kill the insects and other pests which destroy crops. It is now known that these chemicals can also kill humans. HCB is also a pesticide, and both HCB and PCB’s are chemicals that were used in industry. PCB’s are found in electrical equipment and in transformers manufactured in the United States, and other countries, from the 1950’s to the 1980’s. It was during the late 1970’s that the dangers of PCB’s were discovered and their use was then discontinued. Many transformers with PCB’s in them were installed and have been in use on many Pacific islands, including some of the islands in the FSM. Dioxins and furans are by-products released from incomplete burning. Household, municipal, and agricultural burning and internal combustion engines (the motors of cars and trucks) are some of the biggest causes of these dioxins and furans in the Pacific region.

If some of these names sound scary or dangerous, they should! These are some of the most poisonous substances in existence! This is why, in Stockholm (the capital city of Sweden) on 22 May 2001, at a meeting of world experts on the problems of pollution, a treaty was adopted. The specific goal of this treaty was to protect human health and the environment from POPs. The treaty, referred to as the Stockholm Convention, aims to eliminate the production and use of POPs, to minimize and ultimately eliminate the release into the environment of unintentional POPs, and to manage in an environmentally safe manner, all existing materials that are contaminated with POPs.

By 22 May 2002, 151 countries, including the Federated State of Micronesia, had signed the treaty. In the entire history of the UN, more than 50 years, this was the shortest time in which so many nations had ever signed a UN convention. By May 17, 2004 the Stockholm Convention had been ratified by 50 countries, France being the fiftieth signer. At this point the Convention entered into force. The FSM National Government ratified the Stockholm Convention in May 2005. The great importance of the POPs problem is reflected in the serious attention given to the Convention by all of the signing nations.

The dangers of POPs threaten people all around the world, in every country. These dangers do not stop at international or regional boundaries. Therefore, the only way to eliminate the danger of POPs is with the full cooperation of every country. The Stockholm Convention establishes an entity called the Inter-Governmental Negotiating Committee (or INC). This committee works to encourage and pursue good teamwork among all nations. The POPs situation is a case of everyone benefiting if everyone participates, and of everyone losing out if only a few do not participate.

**POPs Awareness Message #2**

**A Very Brief History of Toxic Exposure**

**and**

**What the Stockholm Convention Can Do**

Long before the world had ever heard of Persistent Organic Pollutants (POPs) people were suffering disease and death from exposure to hazardous substances. In most cases the victims had no idea what was causing the poor health outcomes. In the 4th century B.C., Hippocrates (the Greek physician who is honored as the Father of Medicine) identified a case of lead poisoning, one of the first occasions when a substance in use by the general public was discovered to have a harmful effect on an individual’s health.

Many historians believe that one of the major contributing factors to the decline and fall of the Roman Empire in the 4th and 5th centuries A.D. was also lead poisoning. The upper classes of Roman society consumed massive amounts of lead on a daily basis, both in the food that was eaten and the wine and water that was drank. Lead was used in pewter plates, cups, pans, and even as a food seasoning! It was added to wine and since Roman cities used pipes made of lead, (the word “plumbing” comes from the Latin word for lead), everyone who drank the water was further exposed. Historical records from those times describes many cases of mad behavior among the aristocrats, including the infamous Emperor Nero who played music while the city of Rome burned. Upper class women frequently had miscarriages, stillbirths, and gave birth to children with severe mental health problems. Citizens of the lower classes, unable to afford the lead-tainted luxuries, did not experience the same high rates of lead-poisoning related health problems.

In the late 18th Century, Sir Percivall Pott linked the high rate of cancer among chimney sweeps to the soot to which they were exposed on a daily basis. During their working hours, sweeps performed their jobs in small, poorly ventilated places, and were exposed to soot by both skin and contact and respiration. This was one of the first accounts of an occupational exposure to a hazardous substance to be associated with cancer.

These examples, and countless others in more recent times, are an indication of the seriousness of today’s POPs situation. The insidious, or gradual, build-up of POPs substances in an individual’s body from low level exposures that are never recognized (by breathing air, eating food, and drinking water), justify the increase of global concern to address this public health threat. This is why the Stockholm Convention is so important.

The Convention has five major goals. The first is to eliminate dangerous POPs, starting with the twelve worst. The production and use of endrin and toxaphene will be totally banned. The production of aldrin, dieldrin and heptachlor, will be banned, but member countries can use up remaining supplies if the use is in compliance with certain conditions. The production and use of chlordane, hexachlorobenzene, and mirex will be limited to specific purposes and only by countries which have registered for exemption to produce and use. The production of PCBs will be banned and countries will have until 2025 to replace all equipment containing PCBs. The production of DDT will be restricted and the use of DDT limited only to controlling disease vectors, such as mosquitoes. Governments are required to take steps to reduce the release of dioxins, furans, hexachlorobenzene, and PCBs. Finally, imports and exports of the man-made POPs will be restricted.

Countries which have ratified the Conventions will be required to develop national plans for implementing the Convention. These plans are to be completed within two years following ratification.

The second component of the Convention is aimed as supporting the transition to safer alternative substances. The production and use of DDT will be permitted only in accordance with World Health Organization (WHO) guidelines and other conditions. Every three years an assessment will be undertaken to evaluate the current uses and determine if alternatives are available. The year 2025 is set as the year when all PCB containing equipment must be removed from use. Member countries will be permitted to apply for exemptions to produce and use certain POPs substances. Exemptions will expire in five years and a new request will then be needed. Convention member nations will review each request and can reject a request if not justified. At the time when no more requests for exemption are submitted, the exemption will be discontinued. Governments are to develop plans to promote the use of the best available technologies and the best environmental practices.

Aim number three of the Convention is to target additional POPs for action. A “precautionary approach” is to be employed. If there is the threat of serious or irreversible damage, the lack of full scientific scrutiny will not be used as a reason for delaying action. The Convention establishes a POPs Review Committee that will meet regularly to consider additional substances to be added to the POPs list. The financially and technologically rich countries are called upon by the Convention to help other less fortunate countries to find acceptable alternatives to POPs.

The fourth goal of the Convention is to clean-up old stockpiles and equipment containing POPs. Government are requested to develop and implement strategies to identify any products or items containing POPs, and then to manage these items in an environmentally sound manner. The handling, collection, transportation, and storage of POPs contaminated materials must be done safely. The Convention seeks financial aid to assist the poorer countries to properly complete these tasks.

The fifth and final part of the Stockholm Convention seeks cooperation among nations to work together towards a POPs-free future. The Convention seeks to increase public awareness through the provision of accurate and up-to-date information, educational programs, and other activities that will create widespread understanding of the problems of POPs. The long range objective is to prevent future problems with POPs. Governments must make regular reports on the progress being made to implement the treaty, and share success stories and explanations for failures. A clearing house of information for governments and businesses is to be established, and all governments with the capacity are encouraged to support research into the POPs issues and provide technical and financial assistance to poorer nations.

**POPs Awareness Message #3**

**What does “POPs” mean?**

The acronym “POP” stands for Persistent Organic Pollutant. This name is a good one because it describes the three most important characteristics shared by all of these twelve dangerous chemicals. The word “Persistent” is defined as “long lasting, continuing to exist or endure”. POPs chemicals deteriorate or decay very slowly and some of these chemicals can last in the environment for many years or even decades. They also can remain in the tissues of plants and animals (including humans) for a long time, years and years.

The rate at which a substance decays is called its “half-life”. For example, a half-life is the time it takes for one gram of a substance to decay until only one-half gram remains. It is estimated that the half-life of some POPs substances in the human body is seven years. What this means to you is this. If you ate food contaminated with a POPs chemical, or drank POPs contaminated water, or breathed contaminated air seven years ago, half of the amount that entered your body then, is still in you now! And if your exposure to the source of POPs has continued during those seven years, your levels have not decreased, but have increased. Workplace exposure and smoke from Saturday year clean-up fires are examples of repetitive exposures that would increase POPs levels. The same is the case for children at a school where the trashed is burned every week, year after year, in a drum outside the classroom.

Because they are so persistent, POPs chemicals are able to travel long distances by air or water. POPs initially released to air (as might happen at a factory smokestack, an electric power plant, a burning dump, or a burning drum) are carried by the wind and by ocean currents around the earth. Polluted air affects urban populations as well as the environment, and the people living in the downwind direction. Contaminated dirt that is washed into a stream by a rainstorm pollutes the river. Polluted water, used for irrigation, contaminates the soil. POPs chemicals are now a truly global problem, as they have been transported everywhere on earth, by the forces of nature and human activity. The Stockholm Convention is a result of the realization by the nations of the world, that no place on earth can escape this problem, and that the situation will only continue to get worse and more people will get sick and die, unless all nations cooperate to solve this problem.

“Organic” is a chemistry term. Chemicals that have carbon as one of their elements are usually referred to as organic chemicals. Since living things are all based on the carbon element, all animals and plants, that is all living things, can be referred to as “organic”. A metal like aluminum or iron, a rock of granite or basalt, or a piece of glass are all referred to as “inorganic” or not living. POPs substances are called “organic” because they contain carbon. POPs chemicals are able to enter into the body of a person or animal, or into the cells of a plant. A POPs contaminated plant that is eaten by an animal will transfer its POPs chemicals to the tissues of the animal. They can then move farther up the food chain when an animal with POPs in its fatty tissue, is eaten by another animal. The longer living animals at the top of the food chain, including dairy animals and fish, are able accumulate high concentrations, as they continue to consume more and more things which are contaminated with POPs. Being at the very top of the food chain, humans can accumulate the highest concentrations, and suffer the health consequences. Animals also suffer from similar POPs related health problems. The organic nature of POPs substances means that they can also be transferred from mother to offspring during pregnancy or while breastfeeding.

Almost everyone knows what the word “Pollution” means, and a “Pollutant” is something that causes pollution. When air, or water, or soil, or food is polluted, it is no longer clean, it has been contaminated and is no longer safe to use. Pollution has been a problem for mankind for centuries, but it was a much simpler problem in the past. There are two main reasons that pollution is now a major problem for all of the Earth’s population. First, there are more people living on this planet than ever before, more than six billion (6,446,000,000 is the 2005 estimate). People create waste as a part of daily living, and as the number of people increases, so does the amount of waste produced. In the more developed countries, on average one person may create more than one-third of a kilogram per day.

The second reason is that there are many more man-made items being produced than ever before. In Biblical times there were very few pollutants created that could damage the environment or make people sick. In 2005, there are hundreds of thousands of products manufactured in factories located all over the world. These products are shipped to every place on Earth where there are people living, from the big cities to the small atolls. Almost all of the manufactured goods that are in use today also are wrapped or contained in some kind of packaging, thus adding even more products to the list of potential pollutants. Some of the items are poisonous in and of themselves (like pesticides, cleaning agents, and fuels). Some items, when discarded and burned create a toxic smoke containing POPs substances. In many cases, the actual manufacturing processes that create all of these goods, add additional dangerous substances, including POPs chemicals, to the environment.

In the Federated States of Micronesia, according to estimates based upon the 2000 census, there are now as many as 110,000 people living in this island country. The census conducted by the Japanese administration in 1920, indicated that a total of 29,660 persons lived in the area that is now known as the FSM, approximately one-fourth of today’s total. The waste generated by the 1920 residents was almost entirely biodegradable, such as peels, bones, husks, leaves, branches, tree trunks, and other wood materials. There were a few imports in cans and glass, but no plastics or styrofoam, or second-hand automobiles and cheap washing machines. Today, each resident of the FSM creates more waste, and much more waste on a per capita basis is produced, if one also considers all of the non-household waste from stores, restaurants, auto repair shops, etc. Much of it is not biodegradable, and thus is a potential source of pollution, and perhaps POPs chemicals if burned. And the total volume is now four times as much since there are nearly four times as many people creating waste. Also, today your neighbor lives closer to you, and the smoke from his trash fire might be blowing into your house. More people and more dangerous substances are the reasons that POPs are now a local problem, as well as a global problem.

To summarize: POPs do not decay quickly and can remain in the environment (in the air, water, and soil for long periods of time. They accumulate in fatty tissues and they can be passed up the food chain achieving higher concentrations at each level. POPs are mobile and are distributed world wide by air and water, and POPs from other parts of the world may show up in the air, water, soil, or food stuffs in the FSM. POPs are toxic, or poisonous, and can cause people to become sick and die.

**POPs Awareness Message #4**

**How Persistent Organic Pollutants Get Into Your Body?**

Persistent Organic Pollutants (or POPs) enter the body when someone is exposed to a substance that is contaminated with them. Exposure means that you may be breathing air that has POPs chemicals or substances in it. Or, you may eat or drink something that has POPs in it. Or, you may touch something that is contaminated with POPs and they are absorbed through your skin. POPs in smoke or dust can also be absorbed through the skin. POPs are composed of molecules of different chemicals and have various physical characteristics. Some are a crystal (sand like) or powder form, or may be a solid block or have a waxy consistency. Some are liquids, and some can be in a gaseous form. Some are odorless, others have odors similar to turpentine, camphor (moth balls), or a mild chemical smell. POPs colors range from colorless, to while, yellow, amber, tan, and dark brown. The average person would probably not recognize a POPs substance without first receiving some training on identification techniques.

A very important aspect of knowing how a person can be exposed to POPs is understanding that sometimes only a very, very small amount is necessary to make a person sick, and toxic levels for some POPs are measured in *parts per billion* or *trillion* or even *quadrillion.* It is difficult to comprehend what kind of measurement we are talking about, but scientists now have the capability to measure these extremely tiny amounts. An example of *parts per billion* would be one (1) hair out of ten thousand (10,000) heads. The terrifying point of this entire discussion is that for some POPs these very tiny amounts can cause a person to get sick. This means that if you inhale a trillion (1,000,000,000,000) molecules of air, and there are some POPs molecules in it, a danger may be present. Since chemicals containing POPs have been in use for many years, and in some cases many decades, these POPs are now spread throughout the world. As more POPs enter your body, the risk of a POPs related illness may increase. This is not to say that everyone should walk around wearing gas masks, but smoke from a burning pile of rubbish should be avoided.

There are five “exposure pathways” to POPs. Exposure pathways are the ways that POPs can get close to, and then into your body. Almost all POPs substances are man-made, but some are found in the natural environment. Dioxins and furans are created in volcanoes and forest fires and then can be transported by the wind to far distant locations. Although a person may not realize it, he or she may be breathing air that contains these POPs that originated thousands of miles away. In the FSM, people are often exposed to POPs that come from nearby sources: cooking fires, fires started to clean land, or fires to burn trash.

Some POPs are found in a “built up” environment, such as in a large city. Smoke and dust can contain POPs and all of the exhaust from cars, buses, and trucks contain POPs. People living in cities with “smog” often have POPs related illnesses in addition to the respiratory problems caused by polluted air. Residents of Pacific islands and atolls are fortunate that smog is not a problem due to the breezes that blow past almost every day. However, people who live downwind from place like electrical power plants, or burning municipal dumps, are at increased risk. Fuel burning vehicles with engines that are not properly “tuned up” and which blow a lot of smoke from the exhaust system, are adding POPs to the environment. Even on a Pacific island, if you live on a hill by a road, your POPs exposure may be increased by these poorly maintained vehicles.

A third pathway for exposure is occupational, or on-the-job. Many people throughout the world are employed in factories or other industries where POPs are produced, either intentionally or unintentionally. This situation is improving since many of the POPs are no longer produced for commercial use. However, workers at solid waste dumps, cement manufacturing plants, lumber and paper mills, and factories that use fire as part of the manufacturing process can be exposed to POPs. Exposure can be minimized or eliminated by using protective clothing and safety equipment.

The fourth pathway for exposure happens when people use products that have POPs in them. These products include pesticides and insecticides, wood preservatives, cleaning solvents, materials that have been treated with a flame retardant, and various other chemical products. The good news is that most of the manufacturers of these products, located in the United States and Europe, have now found safer alternative chemicals to use and the products no longer contain POPs. When purchasing items not manufactured in the US or Europe, check the labels. If you find POPs, report the product to your local EPA office.

The fifth exposure pathway is through diet, consuming foods that contain POPs. This is one of the pathways that everyone must be careful about. Since POPs have spread all over the world, it is very difficult to completely avoid them in the food that we eat. A survey in New Zealand found that as people get older, the accumulation of POPs increases in their bodies. This is true for everybody, but people do not get sick unless the accumulation gets too high and exceeds a safe level. The meat from a cow or sheep that eats grass that is contaminated will be contaminated, too. Fortunately, the countries that export these meats to the FSM have regulations in place to safeguard the quality of their products. Fish are also a potential source of POPs, particularly if they have been swimming in polluted waters. Exposure can be minimized by washing all produce to make sure that any pesticide residue is removed, and by proper handling of food during preparation and cooking.

The more that a person is exposed to POPs the greater the risk of sickness due to these chemicals. An important fact to remember is that POPs are persistent, they remain in your body for a long time, decaying very, very slowly. POPs can be transferred to the unborn baby from the mother, posing a danger to the health of the baby. If your house often receives smoke from cooking fires, from trash fires, or other sources, it is important that you do something to eliminate this threat to your and your family’s health. The burning of tires also creates dangerous POPs chemicals in the smoke.

**POPs Awareness Message #5**

**Are Persistent Organic Pollutants a Serious Threat to My Health?**

The several diseases that are associated with the various Persistent Organic Pollutants (POPs) can all cause serious health problems that contribute their share to the financial and service burdens on the health care systems and cause grief for the families of sickened individuals. Some of the health risks related to POPs include increased incidence of multiple cancers and tumors, fertility problems, birth defects in babies, learning disorders, and a weakening of the immune system which makes a person more susceptible to many types of diseases.

Fortunately for the residents of the FSM’s many islands and atolls, the POPs doses to which most Pacific Islanders are exposed, are much lower than the amounts that people in the US, European nations, and other larger countries take in. The FSM’s islands support smaller populations than the continents, with far less heavy industry and fewer, smaller urban areas. This helps to keep exposures to many of the POPs and other hazardous substances at relatively low levels.

However, due to the ability of POPs substances to last for very long times and to travel very long distances, the POPs chemicals that were released into the environment many years ago and thousands of miles distant, may right now be negatively affecting the health of populations living on any of the FSM’s main islands of Kosrae, Pohnpei, Chuuk, or Yap, and they will even be found on the most distant of the outer atolls of the country. No place in the world, not matter how isolated, is entirely safe from POPs contamination.

This does not mean that the region does not need to take action. Increasing imports for a growing population translates into potentially increased exposure to everyone. Increases in the number and size of vehicles, and of all engines on the island contributes to higher exposure. All fires contribute, as well. If you use driftwood in your fire, the salt in the wood increases the POPs that are released. In some islands, where firewood is scarce, people use plastic bags to start the fire, also increasing the POPs. In general, when the fire burns at a low temperature and has a lot of smoke, more POPs are released.

Because POPs are persistent and the time when a person becomes ill may be several years after exposure, it is difficult to connect the disease with the POPs exposure. A disease or condition can rarely be traced back to an exposure during childhood, and probably the child was totally unaware of the exposure. As people get older, many of the diseases are typically chronic conditions. More bad news is that POPs are often passed onto the next generation from a mother to her baby during pregnancy and by breastfeeding. This is a time when human being are particularly vulnerable, but the real cause of a health problem later in life may never be truly identified.

As is the case with any pollutant, fragile island environments can be also damaged by POPs. Heavy rainfall washes everything to the sea, a typhoon could cause serious ecological damage. Eliminating, to the fullest extent possible, POPs chemicals from Pacific Island Countries is the solution that will provide as close to a 100% level of protection as possible.

POPs are a threat to the good health of families in the FSM. Not all POPs chemical are found in the country, but the threat should be considered serious because some of the POPs are here now, and their levels are increasing. With carefully planned strategies, the residents of the islands of the FSM will be able to eliminate most of the POPs from their islands. The remainder can be substantially reduced to minimize exposure.

**POPs Awareness Message #6**

**Introducing the Persistent Organic Pollutants “Dirty Dozen”**

These are the twelve chemicals that are included in the original Persistent Organic Pollutants (POPs) list. The Stockholm Convention has mechanisms in place to add additional hazardous chemicals to the list, but these twelve were identified as the most dangerous at that time. The review of the efforts necessary and the lessons learned while trying to eliminate and control the first twelve POPs, will be useful information in planning the activities to deal with the new POPs chemicals added to the list in the future. As of the writing of this up-date, 16 new POPs have been added to the list. Most of these are by-products of the manufacture of other chemicals.

Most of the following information comes from the Agency for Toxic Substances and Disease Registry of the Centers for Disease Control and Prevention, and the Inter-Organization for the Sound Management of Chemicals

1. Aldrin – A pesticide applied to soils to kill termites, grasshoppers, corn rootworm, and other insect pests. Aldrin is a white or tan to dark brown crystalline (sand-like) material. It also comes in a liquid form. It has a mild chemical odor. Aldrin can affect people when breathed in and by passing through the skin. It may decrease fertility in males and females. Low level exposure can cause skin and eye irritation, and may damage the liver. High exposure can cause headache, dizziness, nausea and vomiting, muscle spasms, severe seizures, and death. Aldrin builds up in the body and after years of exposure can begin to affect the nervous system. In the U.S. aldrin was completely banned in 1987. Other names for aldrin include: Seedrin, Octalene, and HHDN
2. Chlordane – Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops. It is a combination of many chemicals, and is a thick liquid whose colors ranges from colorless (clear) to amber which may be odorless or have a mild irritating smell. When used as a spray, Chlordane is mixed with emulsifiers which gives it a milky-looking mixture. Chlordane exposure comes from skin contact, breathing contaminated air, or by digesting contaminated food. High exposure to Chlordane damages the nervous system, the digestive system and the liver. Large amounts swallowed will cause convulsions and death. Exposure to small amounts by ingestion or breathing can cause headaches, irritation, confusion, weakness, vision problems, stomach upset or cramps, vomiting, diarrhea, and jaundice. Chlordane’s use in the U.S. was stopped in 1988, but manufacture for export continues. Other names include Octachlor and Velsicol 1068.
3. DDT – Perhaps the best known of the POPs, DDT (dichlorodiphenyltrichloroethane) was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. It was banned in the US in 1972, but continues to be applied against mosquitoes in several other countries to control malaria. It is a white, crystalline solid with no odor or taste. Exposure is mostly from eating foods (root and leafy vegetables, meat, fish, and poultry) which are contaminated. Near waste sites, both air and drinking water may be contaminated and lead to exposure. DDT affects the nervous system and causes excitability, tremors, and seizures. In women exposure may cause a reduction in the duration of lactation (breast milk production) and increased risk of premature child-birth. DDT probably causes cancer, but this is not yet confirmed. Two other hazardous substances, called DDE and DDD have similar characteristics as DDT.
4. Dieldrin – Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils. Pure dieldrin is a white powder with a mild chemical odor. Mixtures prepared for retail sale may have a tan color. The characteristics of dieldrin are the basically the same as aldrin (see above). Some brand names for dieldrin include Alvit, Dieldrite, Dieldrix, and Quintox.
5. Endrin – This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control mice, moles and other rodents. Endrin is a solid, white, almost odorless substance which has not been sold in the U.S. since 1986. Exposure to high doses may result in headaches, dizziness, nervousness, confusion, nausea, vomiting, and convulsions. Swallowing very large amounts of endrin may cause convulsions and death in a few minutes or hours. Exposure to endrin usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site. Since endrin can remain in soil for as long as 10 years or more, it can be found in plants grown in contaminated soil. It is found in the tissues of organisms that live in water, and also in human breast milk. Other names for endrin include: Compound 269, Endrex, Hexadrin, Isodrin, and Nendrin.
6. Heptachlor – Primarily employed to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes. Heptachlor, in its pure form, is a white powder that smells like camphor. Commercial, less pure grades, may be tan. Use of the substance stopped in 1988. Heptachlor can damage the nervous system, and people who have swallowed it or had skin contact became dizzy, confused or had convulsions. Exposure is usually from eating contaminated foods and milk, or skin contact with contaminated soil. Heptachlor can remain in soil for many years and builds up in the fatty tissues of fish and cattle, and also shows up in dairy products. Exposure usually occurs from the air, water, or soil which has become contaminated due to a nearby hazardous waste site. Heptachlor is found in human breast milk of mother who have had high exposures. Trade names include: Heptagran, Basaklor, Drindrox, Soleptax, Termide, and Velsicol 104.
7. Mirex – This insecticide is applied mainly to combat fire ants and other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods. The substance has not been manufactured or used in the U.S. since 1978. Mirex is a white crystalline solid which is odorless. Exposure occurs mainly from skin contact or eating soil or food that is contaminated. High levels of exposure is linked to damage to skin, the liver, nervous system, and reproductive system. Mirex can remain for years in soil and water, and will build up in the tissues of fish or other organisms that live in contaminated water or eat other contaminated animals. Studies on mice and rats indicate that mirex can cause cancer in animals. Other names are Dechlorane, Ferriamicide and GC 1283.
8. Toxaphene – This insecticide, also called camphechlor, is applied to cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in live-stock. It usually exists as a solid or gas, and in its original form is a yellow to amber waxy solid that smells like turpentine. It was heavily used in the US until 1982 and completely banned in 1990. Breathing, eating, or drinking high levels of toxaphene can damage the lungs, nervous system, kidneys and can cause death. There is no information on the health effects of low level exposures. Studies indicate that toxaphene can be reasonable anticipated to cause cancer. It breaks down very slowly in the environment, so it accumulates in fish and animals. Exposure typically occurs through contaminated air near hazardous waste sites, eating contaminated fish or shell fish, or drinking water from contaminated wells. There are many trade names for toxaphene, some are: Alltex, Attac 4-2, (also 4-4, 6, 6-3) Camphechlor, Compound 3956, Huilex, Motox, Strobane T-90, Texadust, and Vertac 90%.
9. Hexachlorobenzene (HCB) – HCB kills fungi that affect food crops, and was used in the U.S. until 1965. It is also released as a byproduct during the manufacture of certain chemicals and as a result of the same processes that give rise to dioxins and furans. HCB has been used to make fireworks, ammunition, and synthetic rubber. HCB is a white crystalline solid, which is not very soluble in water. It deteriorates very slowly and thus remains in the environment for a very time. HCB particles will settle to the bottom of lakes and rivers, where it can build up in fish, lichens, marine mammals, and then other animals (birds, caribou) that eat these things. Plants growing in contaminated soil will accumulate HCB’s. People are exposed by eating contaminated foods and dairy products, drinking contaminated water or milk, breathing contaminated air, or handling contaminated soil. HCB is found in human breast milk, and workers in factories which unintentionally produce HCB’s can be exposed. Unborn children can be exposed if the expectant mother is exposed. The health effects include liver disease and related complications, and studies show that it is likely a carcinogen. Trade names for HCB include: Amaticin, Anticarie, bunt-cure, Co-op hexa, Granox, Sanocide, Smut-go, and Sniecotox.
10. Polychlorinated Biphenyls (PCBs) – These compounds are employed in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, sealants and plastics. PCBs are mixtures of chlorinated compounds. PCBs are either oily liquids or solids that are colorless to light yellow, and have no known taste. Some PCBs can exist as a vapor in the air. They are man-made; there are no known natural sources of PCBs. The manufacture of these substances were stopped in the U.S. in 1977, because of the evidence that they build up in the environment and cause health problems. PCBs are very long lasting and can be transported by air currents for long distances. Thus, they are everywhere in the environment, being released from hazardous waste sites, leaks from devices containing PCBs, and from the burning of contaminated items. PCBs bind strongly to soils. Most human exposure to PCBs comes from the consumption of contaminated fish and other animals which eat these fish. The most common health effect are skin diseases similar to acne or rash, and possibly liver damage. Many health organizations believe that PCBs are carcinogenic to humans. Women who are exposed to relatively high levels of PCBs may have lower birth-weight babies, and these babies may show abnormal responses in tests of infant behavior. There are many different mixtures of PCB compounds. Askarel, Aroclor, Pyranol, Pyroclor, Phenoclor, Pyralene are some of the trade names.
11. Dioxins – These chemicals are produced unintentionally due to incomplete combustion, as well as during the manufacture of certain pesticides and other chemicals. In addition, certain kinds of metal recycling and pulp and paper bleaching can release dioxins. Dioxins have also been found in automobile exhaust, tobacco smoke, and wood and coal smoke. (See furans for information about these two very similar POPs.)
12. Furans – These compounds are produced unintentionally from the same processes that release dioxins, and they are also found in commercial mixtures of PCBs. Dioxins and furans are produced from natural sources such as forest fires, as well as the man-made sources noted above. The substances can be carried long distances by air and water. As a result, dioxins and furans have existed for centuries, and are now found almost every where at low levels. These substances build up in the food chain, resulting in higher concentration in animals near the top and humans. In the general population, 90% of exposure to dioxins and furans is by eating foods such as meat, dairy products, and fish. Other exposures come from contaminated air and water. People living near uncontrolled hazardous waste sites, or downwind from incinerators or power generation plants may be at increased risk. The health problems which result from high exposures include severe skin disease (chloracne), rashes, skin discoloration, and possibly liver damage. Long term effects include possible altered glucose metabolism (similar to diabetes), and changes in hormone levels. Animal studies have shown an increased risk of cancer from exposure to dioxins and furans.

**POPs Awareness Message #7**

**Evidence of Persistent Organic Pollutants**

When a person accidentally cuts his or her finger with the knife, there is an obvious and unambiguous connection between the causing event (the erroneous stroke of the knife) and the resultant health problem (the cut finger). It is clear and straightforward, cause and effect.

When doctors and scientists examine the causes and effects related to Persistent Organic Pollutants (POPs) and other hazardous substances, there is sometime a clearly understandable connection and sometime there is not. The type and severity of the harmful effects of exposure will be influenced by many factors: the dose (how much), the duration (how long), the exposure pathway (breathing, eating, drinking, or skin contact), the effects of other chemicals or substances to which you may also have been exposed, and your individual characteristics such as age, gender, nutritional status, and the general state of your health. For a “low” direct exposure to many of the POPs substances, the resulting conditions may include one or more of the following symptoms: a skin rash or irritation, severe acne, eye irritation or burning, dizziness, headache, vomiting, convulsions.

Accidental spills of POPs containing pesticides have killed and seriously sickened workers on farms and gardens. The connection between the spill and the resultant injuries and deaths can be easily documented. In the days following the worst industrial disaster in history (on the night of 3 December 1984, in Bhopal, India, a cloud of deadly gas leaked from a tank at a pesticide manufacturing facility and killed over 2,000 people and injured as many as 200,000 others), the investigators of the tragedy were easily able to determine the course of events. However, the harm caused to the environment, to animals, and to human beings, by low levels of POPs chemicals can be very difficult to prove in many cases.

All of the serious illnesses that result from low level POPs exposure, such as cancer, immune system disorders, central nervous system damage, liver malfunction, memory loss, birth defects, other reproductive difficulties, learning disabilities, are conditions that for the most part have a very gradual build up of symptoms and then at a certain point it becomes evident that something is “wrong”. Since the time between exposure and the awareness that a health problem exists may be several years, the connection my never be made, and the culprit substance never identified.

Many of these connections are impossible to link. It is difficult to prove that a person’s immune system may be weaker than it might have been, or that a child is a slower learner than it might have been. So the evidence must be gathered from wherever and whenever it can be discovered. Scientists are gathering more evidence all the time. In the St. Lawrence River (in eastern North America between the US and Canada) beluga whales have been observed to suffer several kinds of cancers, twisted spines and other skeletal disorders, and various afflictions that are seldom, if ever, seen in beluga whales living in other areas with less polluted waters. Alligators living in the US state of Florida have stunted reproductive organs and cases of infertility not found in alligators elsewhere.

There is growing evidence that POPs cause cancer, and in Sweden, Canada and other countries studies have strongly suggested that food with very low levels of contamination are causing immune system abnormalities. Mexican and US studies have shown that children exposed to pesticides, including those containing POPs, have significantly more problems with learning and physical coordination than children living in cleaner locations.

It is not yet possible to measure the overall, world-wide burden of POPs, and it may never happen. Control efforts from the global level down to the neighborhood level, should follow the guidelines of the Stockholm Convention to eliminate and/or reduce the use of POPs substances as quickly as possible. As the first twelve POPs chemicals are successfully addressed the Convention has mechanisms in place to initiate efforts to identify the next set of POPs.

**POPs Awareness Message #8**

**What is the Solution to the Persistent Organic Pollutants Problem?**

The problem is a big one and everyone has a chance to help. Even small efforts at the individual level are valuable and added together can result in major contributions. In the FSM, we are lucky that some of the Persistent Organic Pollutants (POPs) chemicals have never been brought here intentionally, but we are also unlucky in that a relatively small hazardous substance “spill” can cause substantial damage to our fragile island environments. The bottom line is that we must all do our part.

At the global level, all nations need to ratify and follow the Stockholm Convention’s regulations and guidelines. It is our best opportunity to reduce the harm to the environment, the earth’s wildlife, and to the human inhabitants of the planet. POPs contamination and exposure do not stop at the border, they do not stay put in one place. Consensus is essential for an international agreement affecting the entire world. The Convention is a case of everyone benefiting if everyone participates, and of everyone losing if only a few do not join in and cooperate.

At the regional level, nations and international organizations must follow the prescribed actions and recommendations of the Stockholm Convention. Production of all POPs must be stopped as soon as possible, and research in the development of safe alternatives must be supported. Countries must stop the import of POPs, and the use of POPs as soon as possible. Governments must adopt regulations that control the activities, such as incineration and the manufacturing of products that produce POPs as an unintentional byproduct. Citizens should lobby their governments to ratify and adhere to the provisions of the Stockholm Convention.

At the state and national levels, environmentally “friendly” legislation needs to be established. The importation and use of POPs containing substances must be strictly controlled until total elimination is achieved. Governments should encourage and provide legislative support to waste reduction strategies, proper waste management procedures, hazardous substance registration, and regulations that ensure that the general public is well informed and aware of the safe storage, use, and disposal of all potentially dangerous substances.

In the island neighborhoods, community level programs that reduce the waste stream need to be developed, such as the recycling of plastics, metals, glass, and paper. Stores should encourage customers to reuse shopping bags, not to use plastic bags, and decrease the ordering of products with unnecessary, excess packaging. Laws restricting the use of POPs chemicals need to be strictly enforced, and the provision of safe alternative products encouraged. Information must be made available to residents about how to recognize potential POPs hazards, and assistance provided on how to properly dispose of materials containing, or contaminated with, POPs chemicals.

At home, members of the family should reduce, reuse, and recycle as much as possible. Purchase products that are made with recycled materials, and that are not disposable. Don’t trade convenience for an environment polluted with POPs. For example, matches are less harmful to the environment than lighters. Vehicles that are serviced regularly and tuned up properly produce less POPs emissions. Do not burn rubbish, garbage or other trash at your residence. Make sure that cooking fires are supplied with plenty of oxygen and use clean fuel at all times. Do not use plastics or other POPs containing substances to start your fire. If possible, locate cooking locations downwind of the places where people live and sleep. And last, but very important, keep alert to any potential sources of POPs in your village or town. Report them to the Police, the Environmental Protection Agency, or the Health Department.

# ANNEX 3 - Inventory collection workshop – Outcome Report

**FEDERATED STATES OF MICRONESIA**

**PERSISTENT ORGANIC POLLUTANTS (POPs) UP-DATED NATIONAL IMPLEMENTATION PLAN (NIP)**

**Inventory collection workshop, 12 & 13 December 2019 concerning the Toolkit for the Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs)**

**OUTCOME REPORT**

Prepared by:

Department of Environment, Climate Change, and Emergency Management in collaboration with the State EPAs/KIRMA Staff

1. **Introduction**

On December 12 and 13, 2019, the Persistent Organic Pollutants (POPs)/National Implementation Plan (NIP) project conducted workshop/training on POPs/uPOPs inventory collection at the Department of Environment, Climate Change, and Emergency Management Conference Room in Pohnpei, FSM. The objectives of the workshop were: (1) introduction and utilization of the POPs Toolkit for Identification and quantification of Releases of Dioxins, Furans and Other Unintentional POPs; (2) introduction and utilization of other guidance documents for the inventory of newly listed industrial POPs chemicals; and (3) introduce Best Available Techniques(BAT) and Best Environmental Practices (BEP) for POPs chemicals management. Furthermore, the targeted objectives include increased awareness and familiarity with POPs chemicals and the wide range of products that may contain or are contaminated with POPs.

The list of participants is given in Appendix 1 of this report.

The workshop/training was targeted at the state Environment Protection Agency and KIRMA mainly to assist the states gain insight on what POPs chemicals could be found or are in use in their respective states through POPs inventories.

A copy of the workshop agenda is given in Appendix 2 of this report.

On completion of the workshop/training it was expected that the participants should be able to:

* Describe the steps involved in preparing inventories for uPOPs, their associated releases, and through which vector these wastes are released
* Identify POPs chemicals and describe the steps involved in preparing POPs inventories for both industrial POPs and Pesticides
* Describe the ways in which the information obtained through inventories could be used
* Describe the controls in place for managing identified POPs and generally recommended procedures for dealing with POPs throughout their life-cycle

The participants were provided with a USB containing:

* The Toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs
* The general guidance on POPs inventories
* Chemical-specific guidance documents for inventories of:
  + Pesticides
  + Polybromodiphenyl Ethers
  + Polychlorinated biphenyls
  + Short-chain chlorinated paraffins
  + Hexabromocyclododecane
  + Polychlorinated Naphthalene
  + Pentachlorophenol and its salts and esters
  + Perfluorooctane sulfonic acid and related compounds
* Guideline documents on Best Available Techniques and Best Environmental Practices

The following field visits were carried out in support of the training programme

* Pohnpei State Hospital
  + Medical Waste Incinerator
  + Medical Supplies
  + Medical Laboratory
* Pohnpei State Rehabilitated Dump Site

1. **Workshop proceedings**

**Session 1:**

Mr. Jeffrey Yamada, POPs/NIP project coordinator, gave background information on the Stockholm Convention and introduced the goals and objectives of the POPs/NIP review and update project. In addition, the findings from FSM’s current NIP were mentioned highlighting the gaps and limitations which include:

* Need for financial/human capacity
  + Inventory of POPs and their associated releases across all relevant industries
  + Analyses of chemicals and products that contain or are contaminated with POPs
  + Analyses of chemicals present in human
  + Enforcement of regulations
* Cooperation and information input amongst all relevant sectors
  + State and National laws to regulate chemicals

**Session 2:**

Mr. Robert ‘Bob’ Spegal, consultant for the project, gave a brief description of POPs, the different vectors through which POPs can spread, its main identifier, and continued with describing the current situation regarding POPs in FSM. As part of his presentation, Bob used previously developed awareness messages to help convey the negative impacts POPs have to the environment and human health.

**Session 3:**

Bob began the introduction on the Toolkit with background information on Dioxins and Furans, listed the names of other unintentionally produced POPs(uPOPs) and gave brief background information for each. It was noted that although the Toolkit primarily focuses on Dioxins and Furans releases, the potential for releases of other uPOPs usually co-occur and have similarities with Dioxins and Furans. The purpose of the Toolkit is to support Parties in preparing Dioxins/Furans inventories (source inventories and inventories on their associated release estimates) that are consistent in format and content, ensuring that it is possible to compare results, identify priorities, mark progress and follow changes over time at the country level, and regional and global levels.

**Session 4:**

The Toolkit includes ten (10) source categories for which Dioxins and Furans are released. Each source category has a list of classes which have specific designs, operation, and assigned default emission factors that allow it to be differentiated from the others within that category. It is imperative that each source class is properly identified as their specific characteristics can substantially influence the magnitude of Dioxin/Furan releases-these specific characteristics are what determines its assigned default emission factors.

Questionnaires are included in the Toolkit which need to be submitted to their respective sectors/facilities in order to:

* obtain information required to assist with classification of sources for their assigned default emission factor;
* information on their production/activity rates;
* and whether or not any pollution control systems are in place.

Bob used a couple questionnaires as examples walking through the steps on how to classify its source category based on the answers given; and then what information to report and how to report the data through the use of the excel spreadsheet with given formulas that automatically compute releases for each class and each category for each state. It was noted that because inventory is taken place at a state level, a national compilation on source categories would be done by the summation of releases for respective classes across all the states.

**Session 5:**

Day 2 began with meeting Mr. Endy Elias at the Pohnpei State Hospital. The purpose of the visit was to get concrete information on their medical waste incinerator. No records are kept at the hospital as there are no functional incinerators on site. Rather, all wastes are transported to the local dumpsite for management. Later in the day, the group went to the local dumpsite in hopes of getting information regarding this matter, but to no avail. All the incinerators are not functioning (either pending payment for refurbishment or pending installment of power supply) and all medical wastes are either being buried or burned in a 55-gallon drum.

While at the Pohnpei State Hospital, visits to their medical supplies and medical laboratory was conducted. The use of Lindane as a second line of treatment for certain skin diseases was found to be in continued use. According to their stock supplies personnel, five (5) 100ml bottles remain on their shelves and there is no pending plan on importing more.

Because no real solid information was found during the site visits which were meant to be analyzed, part 1 of session 6 was negated. Instead, hypothetical data was used to give experience with reporting through the use of the excel spreadsheet.

**Session 6:**

The second part of session 6 included going through the list of source categories and identifying which may be a potential source of release for all the states and identifying which are major factors. It was noted that each state has different conditions and thus the need for special attention when identifying source classes to ensure data uniformity.

**Session 7:**

A brief overview of the list of industrial POPs chemicals and products that contain or are contaminated with those chemicals was given. In addition, priority sectors for industrial POPs in the country were identified. General steps on how to conduct an inventory for industrial POPs was presented and are as follows:

* Essential elements of the inventory report are:
  + The objectives and scope of the inventory;
  + Description of data methodologies used and how data was gathered;
  + Final results of the inventory for each sector;
  + Results of a gap analysis and limitations should be identified for completion of the inventory;
  + Further actions to be taken to complete the inventory and recommendations.

Because the country does not produce any industrial POPs, the inventories will focus on products that contain or are contaminated with industrial POPs. Guidance documents for each specific industrial POPs were used to create session 7. All the guidance documents for the inventory of industrial POPs follow the same format which is mentioned above.

**Session 8:**

Bob discussed the importance of reviewing and updating the inventories on POPs chemicals in the current NIP and conducting inventories on the newly listed POPs. The main purpose is to identify POPs chemicals and products that contain or are contaminated with POPs currently in use in the country in order to better understand the current situation. For the sound management of the identified POPs, the guidance documents on Best Available Techniques (BAT) and Best Environmental Practices (BEP) can then be referred to. One priority issue that Bob mentioned, which was also identified in the current NIP, is open burning. From the guidance documents for the BAT/BEP on open burning, one important safe alternative would be composting what is biodegradable and recycling plastics and cans.

**Open Discussions:**

A couple other matters that were brought up during the workshop included issues with the inventory collectors’ contract work hours and issues regarding delays in the project implementation. Other open discussion topics included future follow ups on project after updating the NIP and monitoring strategies for proposed action plans included in FSM’s initial NIP.

1. **Evaluations**

Copies of both evaluation forms are provided below.

At the end of the workshop, Bob administered workshop evaluations to get feedback from the participants. A summary of the responses is given below.

Note: The rating scaled from 1-5, with 1 =strongly disagree, 3 =neutral, and 5 =strongly agree

|  |  |  |
| --- | --- | --- |
| **Question** | **Ratings** | |
| **Range** | **Median** |
| Workshop provided me with useful information about the topic | 4-5 | 5 |
| There were meaningful learning experiences for me at the workshop | 3-5 | 4.5 |
| The workshop prepared me to improve my performance to do my job | 4-5 | 5 |
| The facilitator did a good job in keeping the workshop running smoothly | 4-5 | 5 |
| The consultant was knowledgeable about the topic | 4-5 | 5 |
| My questions were answered satisfactorily | 4-5 | 4 |
| The venue for the workshop adequately met the needs of the activity | 4-5 | 4.5 |
| The logistics related to attendance at the workshop were well handled | 4-5 | 4.5 |
| Overall impression of the workshop | 4-5 | 5 |

|  |  |  |
| --- | --- | --- |
| **Question** | **Rating** | |
| **Range** | **Median** |
| The aims and objectives of the training was clearly defined | 4-5 | 4 |
| The topics covered were relevant to the training objectives: | | |
| POPs/uPOPs inventories | 4-5 | 4 |
| POPs chemicals | 4-5 | 4 |
| Chemical management | 4-5 | 4 |
| Participation and interaction were encouraged | 4-5 | 4 |
| The materials provided were helpful, organized and easy to follow | 4-5 | 4 |
| The facilitators were knowledgeable about the training topic | 4-5 | 5 |
| The time allotted for the training was efficient | 2-4 | 4 |

**Please answer the following questions:**

1. What did you like most about the training?

* All responses expressed how new knowledge was gained during the workshop/training.

1. What did you like least about the training?

* All responses centered on time constraints.

1. Is there anything else you would like the training to have covered?

* Individual responses ranged from actions to take in order to prevent health and environmental degradation due to POPs/uPOPs.

1. What would you like to see as a follow up/on from this training?

* Individual responses ranged from including separate trainings for each POPs/uPOPs and trainings on identifying products that contain POPs/uPOPs; and safety trainings for POPs/uPOPs throughout their whole life-cycle.

1. Comments: Individual comments are listed below.

* I think we covered pretty much all the basic things we should know. But we only had a very short time with the hand-on activities. Most of the terminologies and all the pops were new to me. So hopefully I can master them all so it would be easy for me to ask questions to the appropriate people in each department.
* The first day training I was wondering what is POPs when is the POPs are release. But thanks to Mr: Jeff and his partner to teach me and telling me what is POPs and how to work with POPs, Thank you. But I have question to myself can we stop or phase out the POPs in the FSM? Maybe not but we can reduce POPs I think.
* As the training went on, I kept wondering about development that has been undertaken at my home island in the past when these POPs/UPOPs existed but no attention made to mitigate or phase out, I thought that these might be the reason behind why the lifespan of the past generations could reach 80 – 90 years of age. With this, I am grateful of the acknowledgement and the responsibility to get involved in this kind of working group.

**PARTICIPANT LIST**

|  |  |  |
| --- | --- | --- |
| Participant List: POPs/NIP Workshop at DECEM Conference RM | | |
| **Full name** | **Organization** | **Email address** |
| Betwin Tilfas | KIRMA | [577484@park.edu](about:blank) |
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| Robert Spegal | Consultant | [robertspegal@yahoo.com](about:blank) |
| Jeffrey Yamada | DECEM | [jeffrey.yamada@decem.gov.fm](about:blank) |



**WORKSHOP AGENDA**

**Federated States of Micronesia**

**POPs/NIP Inventory Collection Workshop (Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs)**

**Thursday & Friday, 12 & 13 December 2019**

|  |  |  |  |
| --- | --- | --- | --- |
| **Thursday** | | | |
| **Time** | **Session** | **Facilitator** |
| 8:30am- 9:00am | Registration |  |
| 9:00am- 9:30am | Official Opening: Prayer and Opening Remarks, Ground Rules for Workshop | JY |
| 9:30am- 10:00 am  Session 1 | Introductions and Objectives of POPs/NIP review and update   * Background * Goals | JY |
| 10:00am-10:30am  Session 2 | Overview of POPs   * Brief Description * POPs in FSM | RS |
| 10:45-12:00pm  Session 3 | Introduction and Overview of Toolkit   * Dioxins, Furans, and other uPOPs. * Purpose of Toolkit | RS |
| 12:00pm | Lunch |  |
| 1:15pm-4:30pm  Session 4 | Toolkit Presentation (cont.)   * Part II of Toolkit: Classifying source categories and identifying classes * Annex 2: Identifying sources of PCDD/PCDF * Annex 3: Questionnaires   + Open burning of waste and accidental fires (6B)   + Landfills, waste dumps and landfill mining (9A)   + Waste Incineration (1C)   + Asphalt mixing (4A) * Annex 4: Emission Factors * Activity Rates * Level of confidence * Annex 5: Reporting | RS/JY |
| 4:30pm-5:00pm | Wrap-up   * Review of Thursday’s work * Preview of Friday’s planned activities | JY |

**Federated States of Micronesia**

**POPs/NIP Inventory Collection Workshop**

**Thursday & Friday, 12 & 13 December 2019**

|  |  |  |  |
| --- | --- | --- | --- |
| **Friday** | | | |
| **Time** | **Session** | **Facilitator/Format** |
| 8:30am- 10:30am  Session 5 | Activity site #1: Meet up at Pohnpei State Hospital   * Medical waste incineration   + Sample Data collection   + Laboratory and medical supplies visit | RS/JY |
| 10:30am- 12:00pm  Session 6 | Analyze session 5 data   * Questionnaires and to run through Toolkit   Other potential sites/sources of releases   * Part II of Toolkit | RS/JY |
| 12:00pm- 1:00pm | Lunch |  |
| 1:00pm- 2:00pm  Session 7 | General Guidance on Inventories for Industrial POPs   * Introduction on industrial POPs * General steps to conduct inventory | JY |
| 2:00pm- 3:00pm  Session 8 | Best Available Techniques (BAT) & Best Environmental Practices (BEP)   * Introduction on BAT/BEP   + Open burning   + Medical waste incineration | RS |
| 3:00pm- 4:30pm  Session 9 | Future activities   * Create list of tasks to be completed at the state level * Develop submission schedule * Description of national level review of submissions and feedback to the state level, communication arrangements * State level preparation of final submission | JY/RS |
| 4:30pm- 5:00pm | Wrap-up   * Review of Friday’s work * Closing comments and workshop evaluation exercise | JY |

**WORKSHOP EVALUATION BY PARTICIPANTS**

**Workshop Evaluation #1**

Please rate each aspect of the workshop on a 1-5 scale. Thank you for your assistance to improve our workshop efforts!

**1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree**

1. The workshop provided me with useful information about the topic. \_\_\_\_\_\_\_
2. There were meaningful learning experiences for me at the workshop. \_\_\_\_\_\_\_\_
3. The workshop prepared me to improve my performance to do my job. \_\_\_\_\_\_\_\_
4. The facilitator did a good job in keeping the workshop running smoothly. \_\_\_\_\_\_\_\_
5. The consultant was knowledgeable about the topic. \_\_\_\_\_\_\_
6. My questions were answered satisfactorily. \_\_\_\_\_\_\_
7. The venue for the workshop adequately met the needs of the activity. \_\_\_\_\_\_\_
8. Refreshments at the workshop were good. \_\_\_\_\_\_\_
9. The logistics related to attendance at the workshop were well handled. \_\_\_\_\_\_\_
10. Overall impression of the workshop. \_\_\_\_\_\_\_
11. Other comments.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Workshop Evaluation #2**

Please rate each aspect of the workshop on a 1-5 scale. Thank you for your assistance to improve our workshop efforts!

**1-Strongly Disagree 2-Disagree 3-Neutral 4-Agree 5-Strongly Agree**

1. The aims and objectives of the training was clearly defined. \_\_\_\_\_\_\_\_\_
2. The topics covered were relevant to the training objectives
   1. POPs/uPOPs inventories\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. POPs chemicals\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Chemical management\_\_\_\_\_\_\_\_\_\_\_\_
3. Participation and interaction were encouraged. \_\_\_\_\_\_\_\_\_\_\_\_\_
4. The materials provided were helpful, organized and easy to follow. \_\_\_\_\_\_\_\_\_\_\_\_
5. The facilitators were knowledgeable about the training topic. \_\_\_\_\_\_\_\_\_\_
6. The time allotted for the training was efficient. \_\_\_\_\_\_\_\_\_\_\_

**Please answer the following questions:**

7. What did you like most about the training?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. What did you like least about the training?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Is there anything else you would like the training to have covered?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. What would you like to see as a follow up/on from this training?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Secretariat of the Pacific Community (2012). Stocktake of the gender mainstreaming capacity of Pacific Island governments - Federated States of Micronesia. https://pacificwomen.org/wp-content/uploads/2017/09/FSM-gender-stocktake.pdf [↑](#footnote-ref-1)
2. Zvonko *et al.* (2015). Assessment of the Socio-economic Impact of the Chemicals Environmental Contamination. *International Review* (1-2), 113-18. [↑](#footnote-ref-2)
3. UNEP (2014). *Interim guidance for developing a national implementation plan for the Stockholm Convention*. 51pp [↑](#footnote-ref-3)
4. UNEP (2017). Guidance on Socio-Economic Assessment for National Implementation Plan Development and Implementation under the Stockholm Convention. 70pp [↑](#footnote-ref-4)
5. Zvonko *et al.* (2015). Assessment of the Socio-economic Impact of the Chemicals Environmental Contamination. *International Review* (1-2), 113-18. [↑](#footnote-ref-5)
6. Brnjaš *et al.* (2015). Socio-economic aspect of hazardous chemicals environmental impacts. *3rd International Conference. New Functional Materials and High Technology NFMaHT*, Tivat, Montenegro. [↑](#footnote-ref-6)
7. Brnjaš *et al.* (2015). Socio-economic aspect of hazardous chemicals environmental impacts. *3rd International Conference. New Functional Materials and High Technology NFMaHT*, Tivat, Montenegro. [↑](#footnote-ref-7)
8. https://ntn.org.au/wp-content/uploads/2016/12/Final-HHPs-in-Pacific-report-reissued-1.pdf [↑](#footnote-ref-8)
9. The average polymers (plastic, foams and synthetics) in cars are approximately 15 %. Considering an average weight of a car (1.333 t) this means that approximately 200 kg are polymers Please note: The polymer content and the weight of vehicles changes over time with increasing share of polymers. [↑](#footnote-ref-9)
10. <https://www.fsmstatistics.fm/social/population-statistics/> and https://www.fsmstatistics.fm/social/housing-and-household/ [↑](#footnote-ref-10)
11. https://www.fsmstatistics.fm/other-statistics/transportation-statistics/ [↑](#footnote-ref-11)
12. The average polymers (plastic, foams and synthetics) in cars are approximately 15 %. Considering an average weight of a car (1.333 t) this means that approximately 200 kg are polymers Please note: The polymer content and the weight of vehicles changes over time with increasing share of polymers. [↑](#footnote-ref-12)
13. Review of e-waste related Activities in the Pacific Islands March 2018, https://www.sprep.org/attachments/report4-ewaste-baseline-2018.pdf [↑](#footnote-ref-13)
14. The average polymers (plastic, foams and synthetics) in cars are approximately 15 %. Considering an average weight of a car (1.333 t) this means that approximately 200 kg are polymers Please note: The polymer content and the weight of vehicles changes over time with increasing share of polymers. [↑](#footnote-ref-14)
15. http://ers.pops.int/eRSodataReports2/ReportSC\_Submit\_Status.html [↑](#footnote-ref-15)
16. The group will be comprised of representatives of the Environ-mental Office in FSM Departments of Health, state EPA Offices, other selected mem-bers of NACPCM or HWAPWG, and representatives of relevant private sector entities and NGOs. The NSWMPDTF will oversee the development of POPs Solid Waste Management Policy It is anticipated that the National Government POPs Program Coordinator will fill this position, however the NACPCM may decide to have more than one individual working on the POPs Public Awareness program activities at the national level. [↑](#footnote-ref-16)