

Shanghai Waysmos Fire Suppression Co., Ltd.

**Reduction and Phase-out of PFOS in Priority Sectors in
China**

Environmental and Social Management Plan

November 25, 2021

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Abbreviations and Acronyms

APG	Alkyl Polyglucoside
AQI	Ambient Air Quality Index
BOD	Biochemical Oxygen Demand
CCCCF	China Certification Center for Fire Products of the Ministry of Emergency Management
COD	Chemical Oxygen Demand
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FECO	Foreign Environmental Cooperation Center
GEF	Global Environmental Facility
PFOS	Perfluorooctane Sulphonate and Its Salts
PFOSF	Perfluorooctane Sulfonyl Fluoride
PMO	Project Management Office
OHS	Occupational Health and Safety
WB	World Bank
WFS	Shanghai Waysmos Fire Suppression Co., Ltd.

1. INTRODUCTION

1.1 Background

In August 2013, the Standing Committee of the National People's Congress approved the Amendment to Annex A, Annex B and Annex C of the Stockholm Convention on Persistent Organic Pollutants (hereinafter referred to as "the Stockholm Convention"), which lists nine new Persistent Organic Pollutants, and the Amendment to Annex A, which lists endosulfan. On 25 March 2014, the Ministry of Ecology and Environment with other eleven ministries jointly issued a notice banning the production, distribution, use, import and export of perfluorooctane sulphonate and its salts (PFOS) and perfluorooctane sulfonyl fluoride (PFOSF), except for specific exemptions and acceptable purposes. China shall phase out the use of six specific exempt uses of PFOS by the end of the specific exemption period (25 March 2019) as required by the amendment, and gradually implement best available techniques and best environmental practices in the industries with the seven acceptable uses of PFOS, to gradually achieve the reduction and phase-out of PFOS.

PFOS is stable in the environment, minimal volatility, neither hydrolytic nor photolytic nor biodegradable under natural conditions. It is highly bio accumulative and ubiquitous worldwide. PFOS is toxic to reproduction, mutagenicity and development, and is a class of environmental pollutants with systemic and multi-organ toxicity.

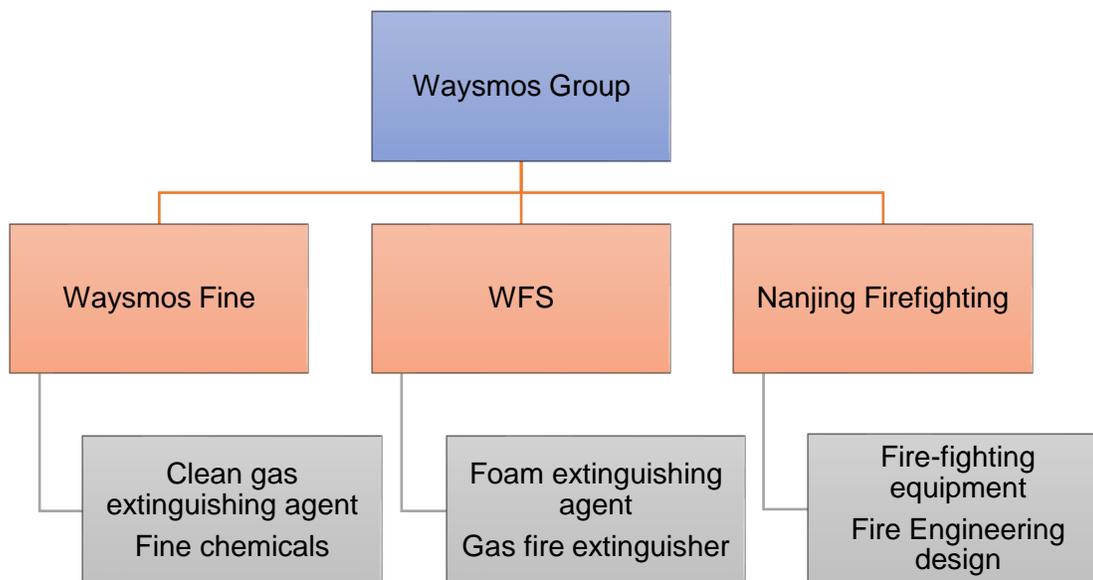
To reduce environmental pollution and fulfil national conventions, the Foreign Environmental Cooperation Center (FECO) of the China Ministry of Ecology and Environment and the World Bank (WB) have jointly developed the "Global Environmental Facility (GEF)-Reduction and phase-out of PFOS in priority sectors in China" since 2015. In 2021, FECO and WB decided to conduct an environmental and social assessment of its PFOS-related production lines at Shanghai Waysmos Fire Suppression (WFS or the company), and to promote and support the elimination of PFOS in production activities by offering grants.

WFS is a medium and minor enterprise that engaged fire foam fire extinguishing agent research, development, manufacturing and sales, it was founded in 1995, the development path are as follows:

- Stage 1, in 1995, the company was established by the Joint Venture between the Chubb Group and the Shanghai Fire Research Institute of the Ministry of Public Security, under the name Shanghai Chubb National Foam Co., Ltd., the company was located in the self-built plant in Tangzhen Town, Pudong New District.

- Stage 2, in 2005, United Technologies (UTC) was granted a full stake in the company, which changed its name to Shanghai Kaide Fire Fighting Equipment Co., Ltd., and in 2008 the company was relocated to a leased plant located in Baoshan City Industrial Park.
- Stage 3, in 2013, Waysmos Group was granted all shares in the company. In June 2015, the company was relocated to the campus of Shanghai Waysmos Fine Chemicals Co., Ltd. (Waysmos Fine) located in the Laogang Industrial Park in Pudong New District (the current site of this pilot project), the company changed its name to Shanghai Waysmos Fire Suppression Co., Ltd. in 2016.

Waysmos Group began in 1995. Waysmos Group is headquartered in Hangzhou City, Zhejiang Province, focusing on fire chemicals, fire equipment research and development and production and sales, Waysmos Group has a number of branches, the main industries are: foam fire extinguishing agents, clean gas extinguishing agents (including heptapropane, hexafluoropropane, perfluorohexone, etc.), fire equipment design, manufacturing and integration, the Group's organizational structure is as follows:



WFS is mainly engaged in foam fire extinguishing agent production, gas fire extinguisher filling and fire extinguishing system assembly business, the current plant is in leased plant of Waysmos Fine. Waysmos Fine was founded in 1995, is a high-tech enterprise that focused the development, production and sales of fire chemicals

WFS currently has three foam fire extinguishing agent production lines, which can produce many models of ordinary water-forming foam extinguishing agent and anti-soluble water-forming foam extinguishing agent, with an annual output of about 1050 tons.

This report consists of an compliance assessment for the existing PFOS-related foam fire extinguishing agent production lines and utilities of WFS, and its existing environmental and social current management system, and an environmental and social impact assessment (ESIA) of the production lines involved in the proposed PFOS reduction and phase-out project (the pilot project).

WFS is located in Shanghai Pudong Laogang Industrial Park, with a total area of nearly 7,000 square meters, including production area and warehouses 6,694 square meters, laboratory area of about 300 square meters. The foam extinguishing agent production capability is about 1,050 tons per year at present. During the period from July to August 2021, Stantec Environmental Engineering (Shanghai) Co., Ltd. (Stantec) was commissioned by WFS to assess its existing environmental and social management system and to prepare an environmental and social management plan (ESMP) for this pilot project (the report).

1.2 Methodology

The following methods were used by Stantec to perform the environmental and social impact assessment, and to prepare the ESMP:

- Review of relevant documents, including (1) environmental impact assessment (EIA) document; (2) environmental and social management system documents, (3) relevant social licensing documents (such as land acquisition impacts), and (4) other environmental and social-related documents and records;
- Online public information research;
- On-site visits to the pilot project and surrounding areas;
- Project stakeholder consultation. These stakeholders include the Laogang Industrial Park Management Committee, Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Shanghai Pudong New District, Waysmos Fine, etc. A list of stakeholder consultation can be found in Appendix A.

1.3 Report Framework

The remaining sections of this report are:

- Section 2: Applicable environmental and social standards;

- Section 3: Project introduction;
- Section 4: Project baseline;
- Section 5: Environmental and social audit;
- Section 6: Introduction of the pilot project;
- Section 7: Management organization setting;
- Section 8: Environmental and social impact assessment of pilot project;
- Section 9: Public participation and information disclosure;
- Section 10: Environmental and social management plan;
- Section 11: Cost estimation;
- Section 12: Appendices.

2. ENVIRONMENTAL AND SOCIAL SAFEGUARD POLICIES

The applicable environmental and social safeguard policies of the World Bank are listed as follows:

Safeguard Policy	Relevance of the Parent Project	Relevance of the Sub-Project (the Pilot Project)	Note
Environmental Assessment (OP/BP 4.01)	Triggered	Triggered	The project activities include raw material replacement, experiments, equipment replacement, product trial production and production activities, which will have an impact on the environment. The project will prepare this environmental management plan to control the environmental risks in the process of equipment removal.
Natural Habitats (OP/BP 4.04)	Not Triggered	Not Triggered	Both of the parent project and the pilot project does not involve natural habitats and nature reserves at all levels, nor does it carry out construction in nature reserves.
Pest Management (OP 4.09)	Triggered	Not Triggered	The parent project triggers the OP 4.09, according to the Environmental and Social Management Framework (ESMF). However, the pilot project does not involve the manufacture, use, purchase and treatment of pesticides, so the pilot project dose not trigger OP 4.09.
Indigenous People (OP 4.10)	Not Triggered	Not Triggered	The parent project doesn't trigger the OP 4.10, according to the ESMF. This pilot project is not located in an ethnic minority settlement and does not trigger the WB's OP 4.10.
Physical Cultural Resources (OP 4.11)	Not Triggered	Not Triggered	The parent project doesn't trigger the OP 4.11, according to the ESMF. This pilot project does not involve material and cultural resources, and will not select sites that affect archaeological, paleontological and historical values to carry out activities.
Involuntary Resettlement (OP/BP 4.12)	Triggered	Not Triggered	The parent project triggers the OP/BP 4.12, according to the ESMF. However, the construction of this pilot project does not involve land acquisition and demolition.

Safeguard Policy	Relevance of the Parent Project	Relevance of the Sub-Project (the Pilot Project)	Note
Forestry (OP 4.36)	Not Triggered	Not Triggered	The parent project doesn't trigger the OP 4.36, according to the ESMF. This pilot project does not involve commercial logging and does not involve virgin forest.
Safety of Dams (OP/BP4.37)	Not Triggered	Not Triggered	Both of the parent project and the pilot project does not involve supporting the construction and rehabilitation of dams, nor will it rely on existing dams or dams under construction on the mission.
Projects on International Waterways (OP/BP7.50)	Not Triggered	Not Triggered	Both of the parent project and the pilot project does not involve international rivers.
Projects in Disputed Areas (OP/BP7.60)	Not Triggered	Not Triggered	Both of the parent project and the pilot project does not involve disputed areas.
World Bank Policy on Access to Information	Triggered	Triggered	Both of the parent and the pilot project will carry out at least 2 rounds of information disclosure and public participation following the World Bank's policies.

The World Bank General EHS Guideline has been referred.

Domestic environmental and social laws and regulations applicable to this report are listed in **Table 2-1**.

Table 2-1: Environmental and Social Laws and Regulations.

Title	Effective Date
General	
Law on Environmental Impact Assessment	2018
Law on Environmental Protection	2015
Management Regulations for Environmental Protection for Construction Projects	2017
Classification Method for Environmental Accident Risk of Enterprise	2018
Notice of the State Council on Issuing the "Thirteenth Five-Year" Ecological Environment Protection Plan	2016
Notice of the State Council on Issuing the Three-Year Action Plan for Winning the Blue-Sky Defense War	2018

Title	Effective Date
Notice on Further Strengthening the Management of EIA and Preventing Environmental Risks	2012
Notice on Issuing the List of Significant Changes in Construction Projects of Some Industries in the Management of EIA	2015
Notice on the Issue the "Thirteenth Five-Year" EIA Reform Implementation Plan	2016
Notice on Job Handover of EIA System and Pollution Discharge Permit System	2017
Notice on Strengthening Risk Prevention and Strict EIA Management	2012
Technical Guideline for Environmental Impact Assessment of Construction Project - General Program	2017
Regulations of Shanghai Municipality on Environmental Protection	2018
Procedures of Shanghai Municipality for Supervision and Administration of Environmental Protection of Construction Projects during and after the Event (Trial)	2019
Air pollution control	
Integrated Emission Standards for Atmospheric Pollutants	2018
Comprehensive Emission Standard of Air Pollutants	1996
Notice of the Ministry of Ecology and Environment on the Release of Sample Emission Permit Undertaking, Emission Permit Application Form and Emission Permit Format	2018
Guidance on Strengthening the Prevention and Control of Dioxin Pollution	2010
Notice on the Issuance of the "Thirteenth Five-Year Plan" for the Prevention and Control of Volatile Organic Compounds Pollution	2017
Emission Standards for Odorous Pollutants	1993
Standard for Catering Service Air Pollutant Emission	2018
Pollution Control Standards for Hazardous Waste Incineration	2001
Emission Standards for Volatile Organic Compounds from Industrial Painting Processes	2020
Regulations of Shanghai Municipality on Prevention and Control of Atmospheric Pollution	2018
Water resource protection	
Environmental Quality Standard for Surface Water	2002
Standard for Groundwater Quality	2017
Law on Water	2016
Law on Water Pollution Prevention and Control	2017
Measures on Water Abstraction Permit Management	2008
Integrated Wastewater Discharge Standard	1996
Technical Guidelines for Environmental Impact Assessment Groundwater Environment	2016
Urban Wastewater Recycling - Water Quality Standard for Industrial Use	2005
Regulations of Shanghai Municipality on Prevention of Water Resource	2018
Noise Emissions prevention	

Title	Effective Date
Law on the Prevention and Control of Pollution of Environmental Noise	2018
Emission Standard of Environment Noise for Boundary of Construction Site	2012
Standard for Noise at the Boundary of Industrial Enterprises	2008
Waste Management and Disposal	
Law on the Prevention and Control of Environmental Pollution by Solid Waste	2020
Standard for Pollution Control on Industrial Solid Waste Storage	2013
Standard for Pollution Control on Hazardous Waste Storage	2013
Standard for Pollution Control on the Hazardous Waste Landfill	2020
National Catalogue of Hazardous Wastes	2021
Management Regulation for Hazardous Waste Transfer Manifests	1999
Occupational Health	
Law on Occupational Disease Prevention and Control	2018
List of Occupational Disease Hazards Risk Categories for Construction Projects	2021
Regulations on the Management of Occupational Health in the Workplace	2021
Technical Specification for Occupational Health Monitoring	2014
Safety	
Law on Production Safety	2021
Measures for Supervision and Management of "Three Simultaneous" Safety Facilities in Construction Projects	2015
Measures for the Management of Safety Production Emergency Plans	2019
Law on Fire Protection	2021
Code for Fire Protection Design of Building	2018
Code for Design of Extinguisher Distribution in Building	2005
Supervision and management regulations for firefighting products	2013
Labor	
Labor Law	2018
Labor Contract Law	2012

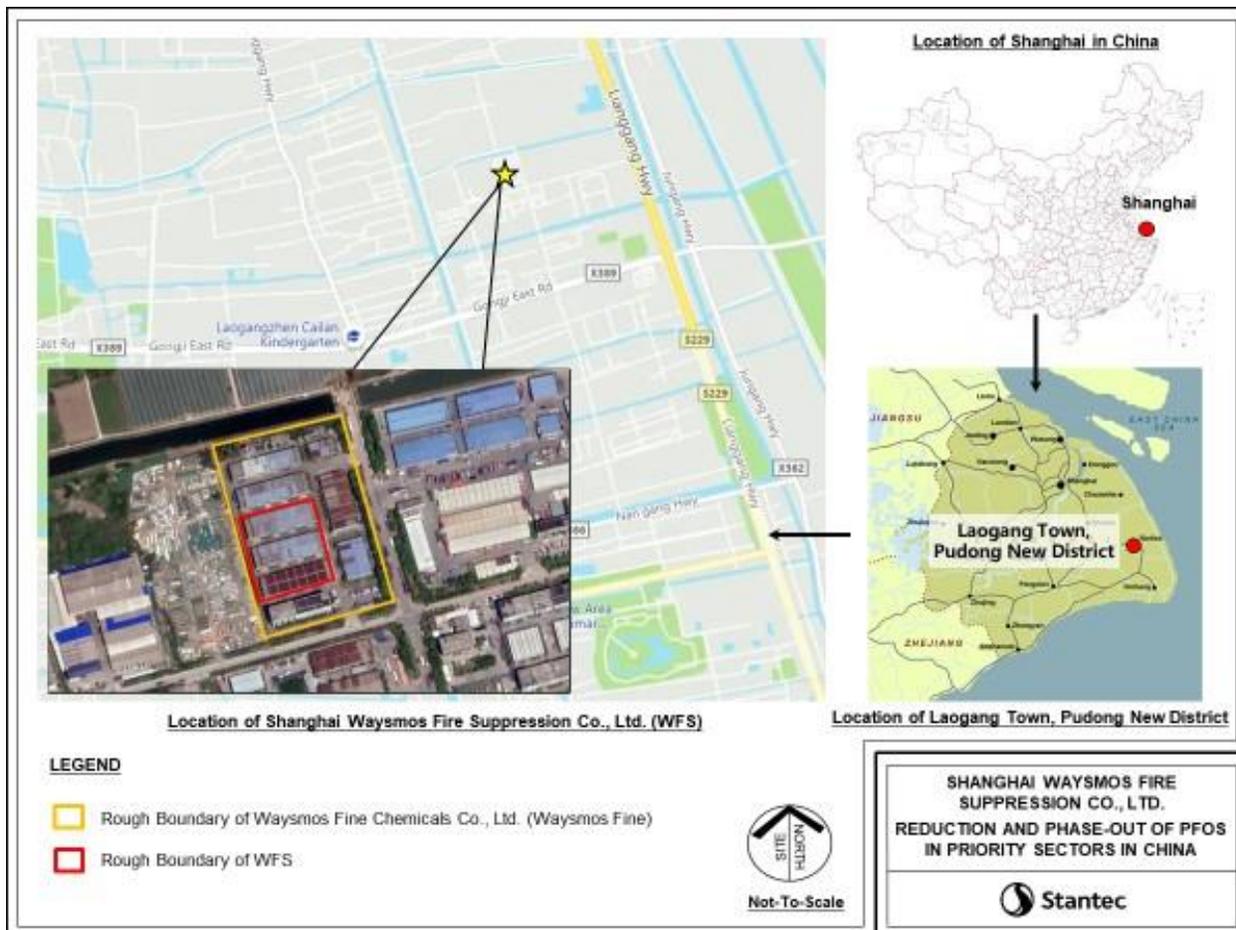
3. SITE INTRODUCTION

3.1 Basic Information

3.1.1 Site Location

WFS is located in No.3 Building, No.4 Building and No.5 Building, No. 388 Liangle Road, Laogang Town, Pudong New District, Shanghai, China. Its specific location is illustrated in **Figure 3-1**.

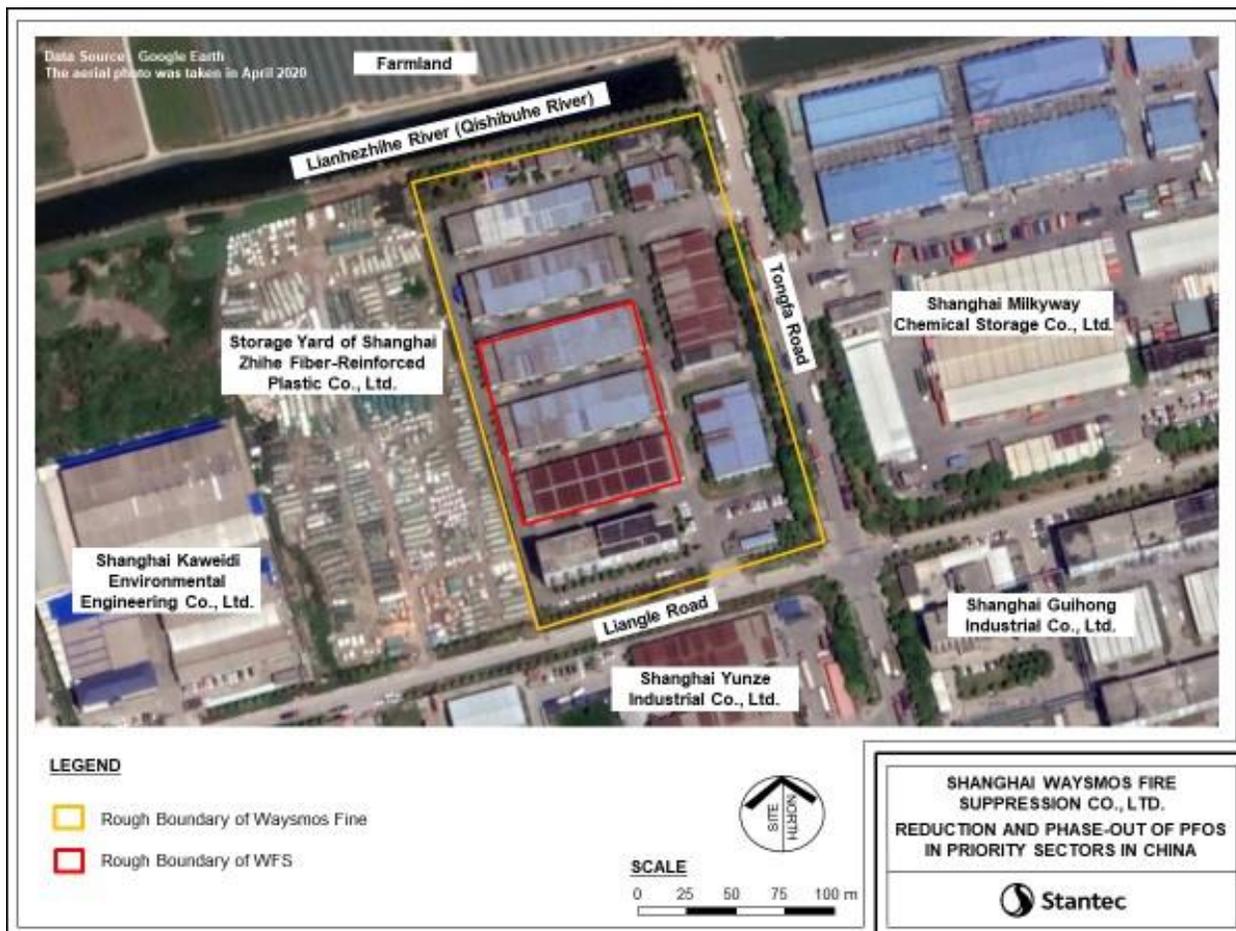
Figure 3-1: Pilot Project Location Map



The above three buildings are all owned by Waysmos Fine, with a total construction area of about 7,000 square meters. Waysmos Fine has obtained the real estate certificate of the above three buildings in 2017(Appendix B). The land use in the title certificate is for industrial/house use, and the period of use is until November 29, 2056 (Refer to 5.4.1 for details about land conditions). WFS has signed a lease contract for the above three buildings with Waysmos Fine. The lease term will end on April 30, 2029.

WFS is located at Shanghai Laogang Industrial Park, which is one of the 104 industrial blocks identified in the "13th Five-Year Plan" for the transformation and upgrading of Shanghai Industrial Park. WFS is surrounded by other industrial enterprises or farmland, and there is no residential area within 500 meters. The area is shown in Figure 3-2.

Figure 3-2: Site Vicinity Map



3.1.2 Site Construction Situation

The 3 buildings leased by WFS are in the southwest of Waysmos Fine. No.3 Building is used as the foam fire extinguishing agent production workshop (including raw material storage area, production area, finished product storage area, laboratory and office area), which is the location of the pilot project. No.4 Building is gas fire extinguisher filling workshops and No.5 Building is gas fire extinguisher warehouses, none of which are related to this pilot project.

In addition, WFS relies on Waysmos Fine's wastewater treatment station (located at the northwest corner of Waysmos Fine's Plant) and hazardous waste warehouse (located in the Category A chemical warehouse in the southeast area of Waysmos Fine's Plant) for wastewater treatment

and hazardous waste temporary storage. Thus, Waysmos Fine’s wastewater treatment station and hazardous waste warehouse are related facilities for the pilot project.

The schematic diagram of the layout of the above facilities is shown in **Figure 3-3**.

Figure 3-3: Site Layout Map



The pilot project is to implement the Stockholm Convention in China, carry out the BAT/BEP, and promote the reduction and phase-out of PFOS in the fire industry eventually. The goal of this pilot project is to develop PFOS-free foam extinguishing agent, and to trial-produce and test PFOS-free foam fire extinguishing products, and gradually achieve the replacement of PFOS-containing firefighting products. The main tasks of the pilot project consist of:

- Research and development of the PFOS-free foam fire extinguishing agents.
- Replacement of production equipment and trial production.
- Quality control of the trail production.
- Testing and evaluation by third parties.
- Fire extinguishing experiments.

- Replacement of the PFOS-containing foam fire extinguishing products.
- Promotion of PFOS-free products.
- Closure of the pilot project.

See **Table 3-1** for details of this pilot project and related facilities:

Table 3-1: Relevant Buildings and Facilities

No.	Building	Structure	Area (m ²)
1	No.3 Building	Frame bent structure	1,800
2	Wastewater treatment station	Frame bent structure	650
3	Waysmos Fine Class A Chemical Warehouse (the building where the hazardous waste warehouse is located)	Frame bent structure	1,320 (the hazardous waste warehouse covers an area of about 30 square meters within the building)

The pilot project and related facilities are all located within the industrial park, and there are no environmentally sensitive points within 500 meters (the conventional buffer distance of environmental impact assessment in China) of the surrounding area. This pilot project does not involve large-scale construction activities, only the replacement of production and testing equipment, and all activities are carried out within the workshop, which has a small impact on the surrounding environment. The pilot project area includes No.3 building, wastewater treatment station and Hazardous Waste Warehouse which are framed in yellow in Figure 3-3, and the area of project influence is framed in orange in Figure 3-3.

3.1.3 Site History

The historical situation of WFS is shown in **Table 3-2**.

Table 3-2: Project History

Year	Activity
1995	It was established as a joint venture by the British Jibao Company and the Shanghai Fire Research Institute of the Ministry of Public Security. The company name is Shanghai Jibao National Foam Co., Ltd. The factory is located in a self-built factory in Tang Town, Pudong New District.
2005	United Technologies (UTC) acquired all the company's shares, and the company was renamed Shanghai Capita Fire Equipment Co., Ltd.
2008	To cooperate with the construction of Shanghai Municipal Metro Line 2 extension project, the company moved to a leased factory in Baoshan Urban Industrial Park.
2013	Waysmos Group acquired all the shares of the company.

Year	Activity
2015	The company was moved to the factory of Shanghai Waysmos Fine, a sister company belonging to Waysmos Group, located in Laogang Industrial Park, Pudong New District, Shanghai (the current site of the pilot project).
2016	The company changed its name to Shanghai Waysmos Fire Suppression.

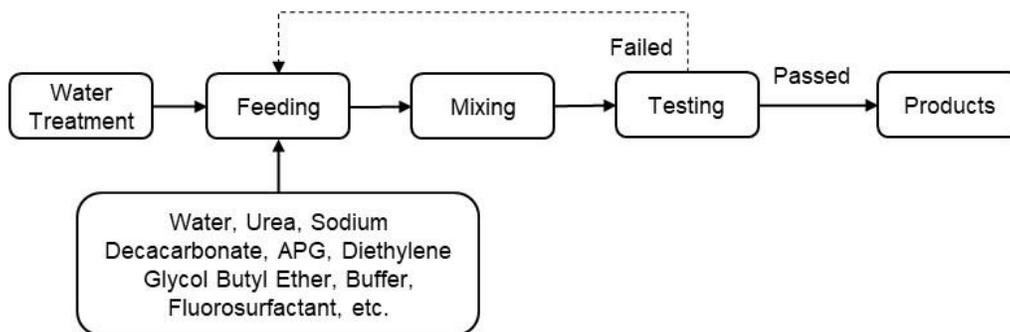
3.2 Production Process

WFS has three foam fire extinguishing agent production lines, which can produce multiple types of ordinary aqueous film-forming foam fire extinguishing agents and anti-solvent type aqueous film-forming foam fire extinguishing agents, with an annual output of about 1,050 tons (of which ordinary aqueous film-forming foam fire extinguishing agents are about 700 Tons, about 350 tons of anti-solvent aqueous film-forming foam fire extinguishing agent). The project has a fixed staff of 8 people and a one-shift system with 8 hours of work per shift and 250 days of work per year.

3.2.1 Production Process of Ordinary Aqueous Film-Forming Foam Fire Extinguishing Agent

The production process of ordinary aqueous film-forming foam fire extinguishing agent is shown in Figure 3-4.

Figure 3-4: Schematic Diagram of the Production Process of Ordinary Aqueous Film-Forming Foam Fire Extinguishing Agent



In actual production, water, urea, sodium decarbonate, alkyl glycoside, alkyl polyglucoside (APG), buffer, fluorosurfactant and other raw materials are firstly mixed, then pumped into the mixing tank. Then pump diethylene glycol butyl ether Pour are pumped into the mixing tank, mixed and stirred for 1 hour. The finished product will be packaged and put into storage after the test is qualified, and the unqualified product will be used as the raw material for compounding. All raw materials are added to the mixing tank through pipelines and metering pumps, mixing and stirring

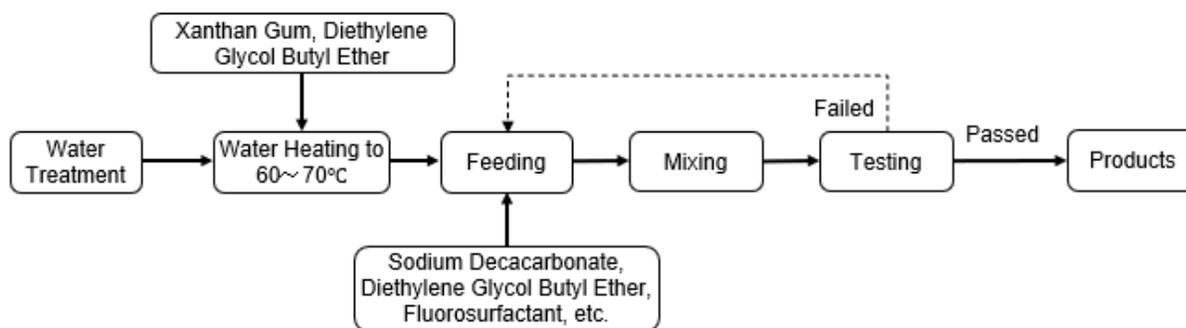
are carried out in a closed state, and the products are also transferred to the finished product container through pipelines and metering pumps.

The above production process is the physical mixing of different raw materials, no chemical reaction occurs, and all operations are normal temperature and normal pressure operations. There is only a difference in the ratio of raw materials between different types of ordinary aqueous film-forming foam fire extinguishing agents. The fluorosurfactant used in the production process contains PFOS, which is the source of PFOS in the product. Since all ordinary aqueous film-forming foam fire extinguishing agents need to add fluorosurfactant (addition ratio between 2% and 6%), all ordinary aqueous film-forming foam fire extinguishing agents contain PFOS.

3.2.2 Production Process of Anti-solvent aqueous Film-forming Foam Fire Extinguishing Agent

The production process of the anti-solvent aqueous film-forming foam fire extinguishing agent is shown in **Figure 3-5**:

Figure 3-5: Schematic Diagram of the Production Process of Anti-Solvent Aqueous Film-Forming Foam Fire Extinguishing Agent



In actual production, the raw materials such as diethylene glycol butyl ether, xanthan gum and softened water are firstly pumped into the mixing tank, and heated to 60-70°C after mixing (in order to reduce the viscosity, no chemical reaction occurs). Then, the raw materials such as sodium decarbonate, diethylene glycol butyl ether and fluorosurfactant are pumped into the stirring tank respectively, and mixed and stirred for 1 hour. The products are packaged and put into storage after passing the inspection, and the unqualified products are used as raw materials for compounding.

The above production process is the physical mixing of different raw materials, no chemical reaction occurs, and all operations except for the heating of the feed water are normal temperature

and normal pressure operations. There is only a difference in the ratio of raw materials between different types of soluble-resistant aqueous film-forming foam fire extinguishing agents. The fluorosurfactant used in the production process contains PFOS, which is the source of PFOS in the product. Since all soluble-resistant aqueous film-forming foam fire extinguishing agents need to add fluorosurfactant (addition ratio between 2% and 6%), all soluble-resistant aqueous film-forming foam fire extinguishing agents contain PFOS.

3.2.3 Raw Materials

All raw materials for the existing project of WFS are purchased except for softened water. The main raw and auxiliary materials involved in existing projects are shown in **Table 3-3**.

Table 3-3: List of Main Raw Materials of Existing Projects

No.	Raw Materials	Annual Consumption	Chemical Properties
1	Softened water	700 tons	General chemicals
2	Diethylene glycol butyl ether	105tons	General chemicals
3	Fluorosurfactant (containing PFOS)	25 tons	General chemicals
4	Sodium decarbonate	115 tons	General chemicals
5	APG	30 tons	General chemicals
6	Urea	7 tons	General chemicals
7	Diammonium phosphate (buffer)	10 tons	General chemicals
8	Tetrasodium EDAT (buffer)	2 tons	General chemicals
9	Xanthan gum	1 tons	General chemicals

4. PROJECT BACKGROUND

The environmental and socio-economic background data of this project use the background data of the Laogang Industrial Park as priority. If there is no corresponding public information in the Laogang Industrial Park, the public information of the Pudong New District, the upper-level administrative division of the Laogang Industrial Park, will be used as a reference. If there is no corresponding public information in the Pudong New District, the public data of the higher administrative division of Shanghai shall be consulted.

4.1 Environmental Baseline

4.1.1 Geographical Location

The project is in Laogang Industrial Park in the southeast of Shanghai Pudong New District. which is located at the junction of China's golden coastline and the Yangtze River Golden Waterway forming a T-shaped structure. Pudong is not only the main gateway for the world economy to enter China, but also a direct channel for the Chinese economy, especially the Yangtze River economy, to enter the world. It is praised as "The door to China's economy, the golden key to open the Chinese market, and the bridge between China and the world economy". The Laogang Industrial Park was established in 1995 and was developed and constructed in 2002. It was confirmed as a district-level industrial park by the People's Government of the former Nanhui District of Shanghai in 2003, with a planned total area of nearly 4 square kilometers. After several years of continuous development, the park has begun to take shape. In 2006, Announcement No. 66 of the National Development and Reform Commission officially became one of the important sections of the "Pudong Airport Industrial Zone" in the municipal industrial zone, with a planned development area of 3.67square kilometers. The scope of the park borders Lianggang Highway in the east, Zhonggang River in the south, Bailonggang in the west, and Liangmin Road in the north. It is one of 104 development zones identified by Shanghai. The project is located in the industrial park and there are no environmentally sensitive receptors around.

4.1.2 Climate and Meteorology

Pudong belongs to the northern subtropical humid monsoon climate zone, which is obviously affected by the oceanic climate, with sufficient sunlight, mild four seasons, and abundant rainfall, but the climate varies greatly between seasons. The whole area has obvious characteristics of the wind field of the southeast (ES) monsoon climate zone, with more southeast (ES) wind in summer and more northwest (WN) wind in winter, and changeable wind direction in spring and

autumn. The dominant wind direction throughout the year is the southeast (SE) wind. Generally, the wind speed is high in spring and low in autumn. The maximum wind speed occurs during the landing of typhoons from August to September, and the maximum wind speed can reach 20m/s.

The annual average temperature of the area is 15.6°C, the extreme maximum temperature is 38.1°C, the extreme minimum temperature is -9.6°C, the average temperature of the hottest month is 27.6°C, and the average temperature of the coldest month is 3.6°C.

4.1.3 Geology

Pudong is called the "son of the Yangtze River". Its stratum is the impact layer of the Yangtze River. The sediment carried by the Yangtze River is continuously accumulated under the action of the waves and tides of the river and sea. The surface is 300 meters of loose cover, and the Quaternary cover is thick. The engineering geological layer is a shallow soil layer within 30 meters of burial, mostly Holocene marine and river-lake sedimentary layers. The lithology is mainly clay, loam and silt. It is divided into (from top to bottom) topsoil layer, first sand layer, first soft soil layer, second soft soil layer, and second sand layer. Among them, the first sand layer is prone to the phenomenon of quicksand under artificial actions, which may cause vibration and liquefaction, and it shall become the main object of consideration for seismic fortification of large and medium-sized structures (buildings).

4.1.4 Ambient Air Quality

According to the Bulletin of the State of Shanghai's Ecological Environment in 2020, the number of days with excellent Ambient Air Quality Index (AQI) in Shanghai was 319, increasing by 10 days from 2019; the excellent rate of AQI was 87.2%, increasing by 2.5 percentage from 2019. Among them, 117 days were excellent, 202 days were good, 39 days were light pollution, 7 days were moderate pollution, and 1 day was heavy pollution; the number of days of severe pollution remained the same as in 2019. 27 of the 47 pollution days in the year, rate ozone (O₃) as the primary pollutant, accounting for 57.5%. 16 out of the 47 pollution days in the year rate PM_{2.5} as the primary pollutant, accounting for 34%. 4 rate NO₂ as the primary pollutant. Accounting for 8.5%.

In 2020, the average annual concentration of PM_{2.5} in Shanghai is 32 mg/m³, which meets the national secondary standard for ambient air quality, which is 8.6% lower than in 2019. The annual average concentration of PM₁₀ is 41 mg/m³, which meets the national secondary standard for ambient air quality, which is 8.9% lower than in 2019. The annual average concentration of SO₂ is 6 micrograms/m³, which meets the national first-level ambient air quality standard, which is

14.3% lower than in 2019. The annual average concentration of SO₂ is 6 mg/m³, which meets the national first-level ambient air quality standard, which is 14.3% lower than in 2019. The annual average concentration of NO₂ is 37 mg/m³, which meets the second-level national ambient air quality standard, which is 11.9% lower than in 2019. The annual average concentration of NO₂ is 37 mg/m³, which meets the second-level national ambient air quality standard, which is 11.9% lower than in 2019. The average 95th percentile of CO in 24 hours is 1.1 mg/m³, which meets the national first-level standard for ambient air quality.

According to the 2020 Yearbook of Shanghai Pudong New District, the ambient air in this area is generally at the level of the second standard, and the average concentration of PM_{2.5} is 33 mg/m³, which is the same as the same period last year. The annual average concentrations of other pollutants, sulfur dioxide, nitrogen dioxide and inhalable particulate matter have all reached the standard, and the overall level of ambient air quality has improved. The AQI excellent rate was 86.2%, increasing by 2.4% over the previous year.

4.1.5 Surface Water Environmental Quality

The Pudong New District has a well-developed water system with a complex river network. The Yangtze River coastline is 46.43 kilometers. Except for the Huangpu River, the rivers running east-west include Zhangjiabang River, Chuanyang River, Bailianjing River and Zhaojiagou River. The north-south rivers include Pudong Canal, Suitang River, Caojiagou River and Majiabang River. According to the 2020 Yearbook of Shanghai Pudong New District, the main rivers that Pudong New District participates in the evaluation of include 20 rivers such as Dazhi River, Chuanyang River, Pudong Canal, Zhaojiagou River, etc., with a total of 43 monitoring sections and a total evaluated length of 371.8 kilometers. According to the latest (2019) monitoring and analysis, the comprehensive water quality assessment category of the river water body belongs to Category III to V. The length of rivers with Category III water quality is 325.8 kilometers, accounting for 87.6% of the total river length evaluated. The length of rivers with Category IV water quality is 37.5 kilometers, accounting for 10.1% of the total river length evaluated. The length of rivers with Category V water quality is 8.5 kilometers, accounting for 2.3% of the total river length evaluated. There are 8 sections in the Dishui Lake area, and there is no significant difference in water quality between sections. The comprehensive evaluation of water quality belongs to Category III, and the main pollution item is total nitrogen. The eutrophication index of Dishui Lake was 51.5, which was lower than the 52.3 of the previous year. It was a mild eutrophication, and the degree of eutrophication throughout the year did not change much from the previous year. Pudong New District was included in the first batch of 68 heavily polluted rivers

assessed by the municipal government. The monthly monitoring results in 2019 show that there is no black and odorous section, the water quality compliance rate is 100%, and the main pollution item is ammonia nitrogen. A total of 7 sections of 2 black and odorous rivers in Huangtong Port and North Xiantangbang River were accepted for assessment by the Ministry of Construction. In 2019, the monitoring results of the water quality of each monitoring section are classified as Category III. The rivers for water function assessment in the new area are Chuanyang River, Zhangjiabang River, Dazhi River, and Tuanlu Port, with a total of 8 monitoring sections. The monitoring results show that all sections meet the standards, and the compliance rate is 100%, the same as in 2018.

The area of WFS is a Category V water quality area. There is a tributary of Lianhe River (Qishibu River) 100 meters from the north of the plant. The water quality control standard of this river is Category IV. The water quality of the river is up to standard. WFS's wastewater is not discharged externally. After being treated by Waysmos Fine's sewage treatment facility, it will be piped into the municipal sewage pipe network of Liangle Road, and finally discharged into the Nanhui Seashore Sewage Treatment Plant for centralized treatment and discharged after reaching the standard. It will not cause any damage to nearby surface water. Influence.

4.1.6 Groundwater Environmental Quality

According to the "Groundwater Quality Standard" (GB/T14848-2017), in 2020, the Shanghai Municipal Bureau of Ecology and Environment conducted groundwater quality monitoring and evaluation at 13 monitoring points included in the national groundwater environmental quality assessment. The evaluation results showed that the number of monitoring points with groundwater quality of Category III, Category IV, and Category V were 6, 5, and 2, respectively, accounting for 46.1%, 38.5%, and 15.4%. The overall quality of groundwater in Shanghai remains stable. The indicators that affect the comprehensive quality evaluation of phreatic water are iron, sulfate and nitrite. Iron is a high background environment in phreatic water, and sulfate and nitrite may be affected by human activities. The main indicators that affect the comprehensive quality evaluation of confined water are iron and manganese, and iron and manganese are also high background environments in confined water.

4.1.7 Acoustic Environmental Quality

According to the Shanghai Municipal Bulletin on the State of the Ecological Environment in 2020, the average equivalent sound level of Shanghai's regional environmental noise during the daytime period is 54.2dB(A), which is 0.7dB(A) lower than in 2019. The average equivalent sound level at

night is 47.8dB(A), an increase of 0.1dB(A) from 2019. The average equivalent sound level at night is 47.8dB(A), increasing by 0.1dB(A) from 2019. During the daytime, 94.4% of the measuring points reached the good, slightly good and average level, and 79.9% of the measuring points reached the good, slightly good and average level during the night. Monitoring data in the past five years shows that the average environmental noise in Shanghai is around 54.0 ~ 56.0dB(A) during the daytime, and around 48.0 ~ 49.0dB(A) during the night, which is generally stable. In addition, the average equivalent sound level of road traffic noise in Shanghai during the daytime is 68.2dB(A), decreasing by 0.1 dB(A) from the road sections evaluated as good, slightly good, and average during the daytime accounted for 90.7% of the total monitored road length, and the road sections evaluated as good, slightly good, and average during the night accounted for 32.3% of the total monitored road length. Monitoring data in the past five years shows that Shanghai road traffic noise is generally stable at 68.0 ~ 70.0dB(A) during the daytime, and between 63.0 ~ 65.0dB(A) at night.

4.2 Ecological Baseline

The natural vegetation in Pudong New District is an evergreen broad-leaved forest belt belonging to the mid-subtropical zone. Because it is located at the southern edge of the northern subtropical zone, the vegetation type has also strongly appeared transitional vegetation in the mixed evergreen and deciduous broad-leaved forest belt. At present, natural vegetation in the territory is artificially cultivated, except for the remaining vegetation in the newly silted mudflat. The largest part of the vegetation is crop vegetation, including cereal crop, cotton, and rape. There are no protected animals and plants around the project.

4.3 Socioeconomic Baseline

4.3.1 Population

Pudong New District is a municipal district of Shanghai, named after its location on the east of the Huangpu River. The Pudong New District covers an area of 1210 square kilometers, and currently governs 12 streets and 24 towns. In 2020, the permanent population of Pudong New District is 5,681,512. In 2019, the annual GDP of Pudong New District was 1,273.4 billion RMB, increasing by 7%. At the end of 2019, the registered population was 3.077 million, the permanent population was 5.5670 million, of which the migrant population was 2.3422 million, and the population density was 4599 people/square kilometers. In 2019, the total regional product value was 1,273.425 billion RMB, increasing by 7.0% over the same period of the previous year, and the per capita regional product value was 224,135 RMB. In 2019, the fiscal revenue was 431.6 billion RMB.

Laogang Industrial Park is a district-level industrial park approved by the former Nanhui County People's Government in 1995, and officially became one of the important sections of the municipal-level industrial park, namely "Pudong Airport Industrial Park", in 2006 by of the National Development and Reform Commission. In January 2010, the Laogang Industrial Park was included in the Jinqiao Export Processing Zone for joint development. Laogang Industrial Park is 12 kilometers away from Yangshan Deepwater Port, 8 kilometers away from Pudong Airport, and across the river from Lingang New City Industrial Park. Gongji Road, the main road in the town's industrial park, connects Lianggang Avenue, G1501 and S32 highways. Tongfa Road extends to Hunan Highway, forming a convenient traffic system with Hutong Railway and Line 16 Light Rail near the industrial park. Laogang Town has also become a traffic fortress on the hub channel connecting the two ports. In addition, the Jinqiao Development Zone has established an industrial base in Lingang, and the Laogang Industrial Park, which is also the Dajinqiao plate, will be able to implement joint development.

According to the main data results of the seventh national census released by the National Bureau of Statistics in May 2021, the total population of the country is 1.41178 billion. The total population of China, Shanghai and Pudong New District in 2020 is shown in **Table 4-1**.

Table 4-1: Total Population and Population Density in 2020

Subject	China	Shanghai	Pudong New District
Area (square kilometers)	9,600,000	6,340.5	1,210.41
Population (ten thousand people)	141,178	2,487.09	568.15
Population density (person/square kilometers)	145.8	3,922	4,694

Data source: Statistical Communiqué of the People's Republic of China on the 2020 National Economic and Social Development; Communiqué on Major Data of the Seventh National Census of Shanghai Municipality.

According to the "Main Data Bulletin of the Seventh National Census of Shanghai", among the city's permanent population, the population of Han nationality is 24,471,085, accounting for 98.4%; the ethnic minority population is 399,810, accounting for 1.6%. According to the data bulletin of the sixth national census, the minority population in Pudong New District accounts for 1.16%, and this project does not involve minority populations and living areas.

4.3.2 Economy and Income

According to the "Statistical Communiqué of Shanghai Municipality on National Economic and Social Development in 2020", Shanghai's GDP was 3.87058 billion RMB in the whole year, increasing by 1.7% over the previous year. Among them, the added value of the primary industry

was 10.357 billion RMB, decreasing by 8.2%; the added value of the secondary industry was 1,028.947 billion RMB, increasing by 1.3%; the added value of the tertiary industry was 2,830.754 billion RMB, increasing 1.8%. The added value of the tertiary industry accounted for 73.1% of Shanghai's GDP, increasing by 0.2% over the previous year.

The basic regional social and economic situation in 2019 are shown in **Table 4-2**.

Table 4-2: Basic Social and Economic Conditions

Category	China	Shanghai	Pudong New District
Area (square kilometers)	9,600,000	6,340.50	1,210
Permanent residents (ten thousand people)	140,005	2,428.14	568.15
Population density (person/square kilometers)	148	3,830	4,599
GDP (billion RMB)	99,086.51	3,815.532	1,273.425
Proportion of primary industry (%)	7.1	0.27	0.2
Proportion of secondary industry (%)	39	27	22.5
Proportion of tertiary industry (%)	53.9	72.73	77.3
GDP per capita (RMB)	70,724.6	157,279	224,135
Annual per capita disposable income (RMB)	30,733	69,443	71,647
Annual per capita disposable income of urban residents (RMB)	42,359	73,615	/
Annual per capita disposable income of rural residents (RMB)	16,021	33,195	/

Data source: Statistical Communiqué of the People's Republic of China on the 2020 National Economic and Social Development; Communiqué on Major Data of the Seventh National Census of Shanghai Municipality.

Disposable Income Per Capita

In 2020, the per capita disposable income of Shanghai residents is 72,232 RMB. Among them, the per capita disposable income of urban permanent residents was 76,437 RMB, increasing by 3.8%. The per capita disposable income of rural residents was 34,911 RMB, increasing by 5.2%

4.3.3 Human Resources

In 2020, 570,400 new jobs were created, 63,300 people with employment difficulties were employed, and 180 households of unemployment were eliminated in Shanghai. In the whole year,

12,546 people were helped and led successful entrepreneurship, of which 9,414 were young graduates. 9,956 long-term unemployed young people were helped to achieve employment and entrepreneurship. 1,762,500 subsidized vocational trainings were completed throughout the year. Among them, 957,000 migrant workers received subsidized vocational training, and highly skilled personnel accounted for 35.03% of skilled workers.

By the end of the 2020, more than 260,000 work permits for foreigners had been issued in Shanghai, of which nearly 50,000 were foreign high-end talents (category A), accounting for about 18%. Nearly 800 confirmation letters for foreign high-end talents have been processed.

By the end of the year, there were 135,400 registered unemployed persons in cities and towns. The registered unemployment rate in cities and towns was 3.67%, remaining stable within 4.3%.

5. ENVIRONMENTAL AND SOCIAL AUDIT

5.1 Environmental Audit

The EIA form of "Fire Extinguishing Agent Production, Gas Extinguishing Agent Filling and Fire Extinguishing System Assembly Project" of WFS has been approved by Shanghai Pudong New District Environmental Protection and City Appearance and Sanitation Administration Bureau in July 2018, and finished the self-completed environmental protection acceptance process in November 2018. In August 2020, WFS completed the registration of fixed pollution source discharge, valid from August 7, 2020 to August 6, 2025. The above environmental administrative permit covers all the existing production activities of WFS.

The compliance of WFS in water supply and wastewater discharge, air discharge, noise discharge, chemical management, solid waste management, ecological impact management and other aspects is detailed as follows.

Water Supply and Wastewater Discharge

The water usage of WFS includes production water and domestic water. The water is provided by municipal water supply system, production water consumption is about 778 tons/year, domestic water consumption is about 251 tons/year.

The wastewater of the project is mainly domestic wastewater (including a small amount of laboratory cleaning wastewater) and concentrated water from water soften equipment. The annual discharge of domestic wastewater is 226 tons, and the annual discharge of concentrated water is 77.8 tons. The above wastewater is discharged into Waysome Fine's wastewater treatment station together with the wastewater of Waysome Fine through the process of "hydrolysis acidification + contact oxidation" to reach the discharge standard, and then into the municipal sewage pipe of Liangle Road. Finally, it is discharged into Nanhui Haibin Wastewater Treatment Plant for centralized treatment and discharge.

According to the test results of Shanghai Huamin Environmental Testing Technology Co., Ltd. on wastewater on December 4, 2020 (see **Error! Reference source not found.**), the effluent water quality meets the requirements of Class III standard in Table 4 of Comprehensive Sewage Discharge Standard (GB8978-1996). Ammonia nitrogen conforms to the Class B standard of Water Quality Standard in Table 1 of Sewage Discharged into Urban Sewage (GB/T 31962-2015).

Table 5-1: Wastewater Testing Result

Test point	Date	Item	Value	Standard	Compliance
Discharge Outlet	2020.12.4	pH	7.69	6~9	√
		SS (mg/L)	< 4	400	√
		COD (mg/L)	26	500	√
		NH ₃ -N (mg/L)	0.092	45	√
		BOD ₅ (mg/L)	7.6	300	√
		Appearance (mg/L)	Colorless, odorless and clear liquid	/	√

In addition, according to the EIA and its approval, WFS's wastewater pollutant discharge limit is: 0.0003 tons of chemical oxygen demand (COD) per year, ammonia nitrogen emissions of 0.00007 tons per year. The WFS's actual wastewater discharge meet the limits.

Air Emission

The production process of WFS is physical compounding, and the main production process is mixing and stirring. Raw materials such as diethylene glycol butyl ether and xanthan gum are pumped into the mixing tank through pipes and metering pumps, and the mixing tank is airtight, and the whole production process has no exhaust gas.

Noise Emission

WFS only operates during the day, so there is no noise emission at night. The noise of the project is mainly generated by the operation of the equipment such as stirrer, filling machine, vacuum pump and air compressor. On December 4, 2020, Shanghai Huamin Environmental Testing Co., Ltd. detected the noise at the factory boundary (see **Table 5-2**). The noise monitoring result is in line with the Class III standard (65dB during the day) of Industrial Enterprise Factory Boundary Environmental Noise Emission Standard (GB12348-2008).

Table 5-2: Noise Test Result

Test point	Date	Day value Leq[dB (A)]		
		Test value	Standard	Compliance
North boundary	2020.12.4	48.6	65	√
East boundary		50.4	65	√
South boundary		50.6	65	√
West boundary		54	65	√

Chemicals Management

The chemicals used as raw materials include diethylene glycol butyl ether, 4C1470 fluorosurfactants, sodium decarboxylate SLS1030, alkyl glycoside APG0810, diammonium hydrogen phosphate, urea, tetrasodium EDTA 4 and xanthan gum, which do not belong to dangerous chemicals. The chemicals used in equipment maintenance and fire extinguishing experiments include lubricating oil, equipment solvent oil and 120# rubber solvent oil, among which 120# rubber solvent oil is dangerous chemical. According to the on-site inspection, WFS general chemicals are stored in the designated raw material area of the workshop with identification, and 120# rubber solvent oil and lubricating oil are stored in the special flammable liquid chemicals storage cabinet.

Solid Waste Management

Solid waste of WFS mainly consists of waste packaging barrels, waste bags and staff household garbage generated in unpacking process, among which waste diethylene glycol butyl ether packaging barrels is hazardous waste, and their production amount and treatment methods are as follows:

- General waste packaging barrels and bags is about 1 ton per year, which will be collected and recycled by raw material manufacturers;
- The annual production of hazardous waste (diethylene glycol butyl ether waste packaging barrels) is about 1 ton. WFS has signed the hazardous waste disposal agreement with the qualified Shanghai Xinjinjiao Environmental Protection Co., Ltd., and regularly transfers the waste for disposal;
- Household garbage is collected and transported by Laogang City Sanitation Office to Laogang Garbage Transfer Station for treatment, with an annual output of about 2.5 tons.

Ecological Impact Management

WFS is located in Laogang Town, Pudong New District, Shanghai. Plant resources in this area are mainly cultivated food crops, cash crops and vegetables, and animals are mainly artificially bred livestock. According to the investigation, WFS is not within the nature reserve, scenic spot, cultural heritage reserve, water source protection area and other areas that need special protection, this area does not have cherish animal and plant species, and does not belong to soil erosion, land desertification, rock desertification, salinization and other sensitive and fragile ecological environment areas. As a result, the potential impact of WFS on the local ecosystem is

limited. WFS has protected the plant and surrounding ecological environment by planting trees and hardening the ground

According to online information, consultation with on-site management personnel and staff of environmental protection management department of laogang Industrial Park Management Committee, WFS has not received any complaints from surrounding residents or punishments from local government departments during its operation.

5.2 Occupational Health Audit

Occupational hazard factors in the workplace during the operation of WFS are identified as follows:

Noise hazards: mainly from pump, stirring tank and other equipment operation. WFS chooses the type with low noise in the selection of pump mixing tank and other equipment, and installs the vibration damping pad for several equipment, which is square cement vibration damping foundation. In addition, the equipment with high noise is arranged in the production area to reduce the impact of noise on the non-production area. The WFS also equipped its employees with earplugs during the operation.

Chemical hazards: mainly from chemicals used in the production of fire extinguishing agents. At present, the chemicals used in the production process of WFS are all general chemicals. Chemicals are stored in designated areas with complete outer packaging. Chemicals are transported to the mixing tank through pumps and closed pipes to minimize workers' direct contact with the chemicals. The chemicals used in equipment maintenance are stirring lubricating oil, equipment solvent oil and 120# rubber solvent oil, of which 120# rubber solvent oil is a dangerous chemical, but the frequency of use and quantity used are relatively small (annual use of about 300 liters), the oil substances are placed in a special flammable liquid chemicals storage cabinet. WFS has equipped its employees with personal protective equipment (PPE) such as protective masks, protective glasses, protective gloves and work clothes. In addition, the work site is equipped with emergency sprinkler and eye washing facilities.

As for the occupational hazards factors mentioned above, WFS has established an occupational health management system, and the general manager is fully responsible for the occupational health management. WFS has commissioned a qualified third-party to carry out the pre-assessment of occupational hazard. The assessment of the occupational disease hazard control effectiveness and the related completion acceptance inspection activities are still in progress. WFS promises to complete the above work by December 2021. The proposed timeline is listed in **Table 5-3**.

Table 5-3: Proposed Timeline of the Occupational Disease Hazard Control Effectiveness Assessment and Completion Acceptance Inspection

Working procedure	Time
Designing of occupational hazard prevention and control facilities	November
Industrial hygiene monitoring and assessment	November to December
Completion of the occupational disease hazard control effectiveness assessment report and completion acceptance inspection procedures, and the occupational hazards declaration	End of December

After the completion of the above work, WFS shall, in accordance with the evaluation conclusions, complete the declaration of occupational hazards, organize the employees who are exposed to occupational hazards to participate in occupational health examination. In addition, in the existing staff training plan of WFS, there is a lack of training content on occupational hazard protection. According to the consultation with the workers of WFS, WFS has not carried out special occupational health training yet. WFS promises to carry out special occupational health training within one month after the completion of the occupational disease hazard control effectiveness assessment and related completion acceptance inspection procedures.

5.3 Safety Audit

The production of WFS does not involve highly toxic chemicals, highly toxic goods, and explosive chemicals, does not involve dangerous chemical reactions, and there is no significant hazard source of dangerous chemicals. The main hazardous and harmful factors during operation include:

Mechanical damage: there are many rotating equipment (pumps, stirrers, etc.) in the production area, if the safety protection facilities of the above mechanical transmission part are not perfect, the rotating parts such as the coupler may have wound, extrusion, cutting and other mechanical damage risks. In addition, the mechanical equipment in operation may throw unstable parts (workpiece), hit the human body, thereby posing a threat to personal safety.

Electric shock: the equipment in the production area is electrically driven, which may cause electric shock accidents due to leakage of electrical equipment and violation operation. When the human body is electrocuted, it will cause falling due to nerve paralysis.

Fall from high place: There is a working platform in the production area, which is about 3m above the ground and is equipped with protective fences and escalators. If the protective fences and escalators become loose or broken, workers may fall from a high place during platform operation or inspection.

Fire accident: 120# rubber solvent oil will be used as fuel in the fire extinguishing experiment. 120# rubber solvent oil is usually placed in a special flammable liquid chemical storage cabinet. If the container is damaged and leaked, a fire accident may occur in the case of contact with fire source or heat source.

WFS has commissioned a qualified third-party agent to carry out safety pre-evaluation, preparation of safety protection facilities design, and completion of safety facilities acceptance procedures. It also has prepared and released the production safety accident emergency plan (the latest version of the emergency plan was released in May 2020), and organized relevant training and drills relying with Waysmos Fine.

WFS has set up a safety production management organization. The company's general manager is the person in charge of the enterprise, who is fully responsible for the safety production management. WFS has established a safety management system for safety risks existing on site. According to WFS management personnel consultation, during the operation, site workers would carry out safety self-inspection before starting the day of production operations and organize a comprehensive safety inspection every month.

The safety management personnel have obtained the safety production knowledge and management ability training certificate as required. The site has obtained the special equipment registration certificate and completed regular inspection for the forklift. The operator of the forklift has also obtained the special equipment operator certificate. To date, there has no industrial injury or accident happened since WFS operates.

The building (No.3 Building) where the pilot project located is owned by Waysmos Fine, who has obtained the approval of fire acceptance for the building. The building is equipped with fire hydrants, mobile fire extinguishers, emergency lights, emergency signs and emergency evacuation maps. WFS is responsible for entrusting qualified third-party organizations to carry out annual testing of fire protection facilities and lightning protection devices. The test results in 2020 all met the relevant requirements of laws and regulations.

5.4 Social Audit

Project Land Use

WFS and Waysmos Fine have entered into a lease agreement. The latest lease agreement was signed on April 20, 2019 (see Appendix C). According to the agreement, the lease term is from May 1, 2019 to April 30 2029, covering an area of about 7,000 square meters. This pilot project

mainly involves 3 factories, covering an area of about 1800 square meters. The property right holder, Waysmos Fine, holds a total of 35,728 square meters of real estate warrants.

Waysmos Fine moved from Liuzao Town, Pudong New District, Shanghai to the self-built plant in Laogang Industrial Park in December 2014. After consultation with the management of Waysmos Fine and the management committee of Laogang Industrial Park, it was confirmed that the Laogang Industrial Park was established in 1995 and there were no remaining problems related to land acquisition in the local area.

Labor

WFS has formulated labor management procedures in accordance with relevant labor laws and regulations of China and Shanghai, including recruitment management measures, work schedule system, performance management measures, compensation and benefits management measures, dismissal management measures, employee career development, safety and environmental protection management measures, etc.

According to the consultation with the management and the review of relevant documents, there are 8 employees in WFS, including 1 general manager, 2 from the administrative department, 2 from the technical department (including 1 from the laboratory), 2 from the production department and 1 from the sales department. There are no temporary workers involved in this project. Among the 8 employees, 5 have worked for more than 10 years (Mr. Pan started to work here in 1997, Mr. Hu started to work here in 1996) and have signed permanent employment contracts; Three (1 administrative, 1 sales and 1 production staff) have also worked for more than 3 years (Mr. Sheng, a production worker, has been working here since 2015). There are no child labor and underage workers involved.

According to consultations with the management and review of relevant documents, there are 3 production workers among the 8 employees of WFS. The working hours of the employees are the same, from 8:30 to 11:30 and from 12:30 to 16:30. They work for 8 hours a day, from Monday to Friday. Timetable is clearly listed in the Employee handbook.

In this audit, according to the consultation with the management, WFS does not advocate overtime, and there is no clear peak production period. Employees all enjoy normal holidays. Consultation with employees shows that overtime work is limited in the factory. Occasionally overtime work occurs when delivering canned products to customers. In case of overtime work, time off will be arranged. During the on-site audit, it is found that the employees were already having lunch when the audit team checked the canteen at 11:10 am.

During the audit, employees' labor contracts, personal files, attendance sheets, payroll and social insurance purchase vouchers were provided for review. According to the minimum wage standard of Shanghai in 2020 (i.e., 2,480 yuan/month), the salary of WFS workers greatly exceeds this standard (the minimum salary is over 5,000 yuan/month).

The document review and on-site consultation indicates no signs or phenomenon of underage workers, child labor, gender discrimination and harassment, and forced labor. WFS has established a clear written social responsibility management procedure for anti-discrimination, anti-harassment, prohibition of child labor and prohibition of forced labor. According to the consultation, employees' satisfaction is high. Following feedbacks were collected during the audit:

- Good company culture, good communication with administrative department, and pleasant work environment;
- Due to the small size of the team, colleagues cooperate with each other and get along well with each other;
- Clean working environment;
- The company provides good trainings. Staff consultation found that three workers indicated they have participated in trainings including HSE staff training, and employee mentioned the company has provided trainings related to business ethics. In addition to this, they can also get certification via external training, such as forklift truck operation training.

The management consultation confirms that all staff of WFS enjoy the welfare stipulated in the Labor Law of the People's Republic of China. The specific benefits enjoyed by female employees are as follows:

- Women enjoy maternity leave in accordance with the law. During pregnancy, she will avoid manual labor and will transfer to another position if necessary.
- Women are legally entitled to 1 hour breastfeeding leave while they are in lactation period;
- On Women's Day, the company gives gifts to women workers (such as daily necessities, tissues, shampoo, etc.).

WFS and Waysoms Fine share a self-operated canteen, providing free lunch for employees. The standard is four dishes and one soup. During this audit, valid canteen operator health certificate and food business license are provided. The staff are mainly local workers, who have normal commutes and go back home at 16:30. WFS does not provide dormitory.

Surrounding Communities Impact

WFS is located at Shanghai Laogang Industrial Park, which is one of 104 industrial blocks determined in the 13th Five-Year Plan of Shanghai Industrial Park transformation and upgrading. The surrounding area of this project is other industrial enterprises or farmland, and there is no residential area within 500 meters. According to the field investigation, there are no environmental sensitive points within 500 meters around. Therefore, the operation of WFS has a limited impact on the surrounding communities.

Ethnic Minorities

According to the on-site audit and consultation with the park management Committee, the local area is not inhabited by ethnic minorities, and the project land does not involve ethnic minorities, so the project does not involve the impact on ethnic minorities.

The Grievance Mechanism

WFS has established an internal grievance mechanism. Waysmos Fine has about 70 employees and has established a trade union. WFS is also a member of the trade union, so its employees have also joined the union. Employees are free to appeal to the trade union and the general manager's office (the general manager's mailbox is set up in the smoking area of the canteen). Upon receipt of the complaint, a reply will be made within 5 working days as to whether it is accepted or not. The trade union or the general manager's office shall review the grievance within 5 working days upon receipt of the grievance, and coordinate and communicate with the complainant and the personnel responsible for resolving the grievance. If the problem cannot be resolved still, they are advised to go through judicial procedures. According to consultation with the managers and employees, if necessary, employees would appeal to their leaders orally, and then deal with their appeals, feedbacks and concerns, but there was no record of any appeal so far. According to the consultation, no employee has ever filed a complaint to date.

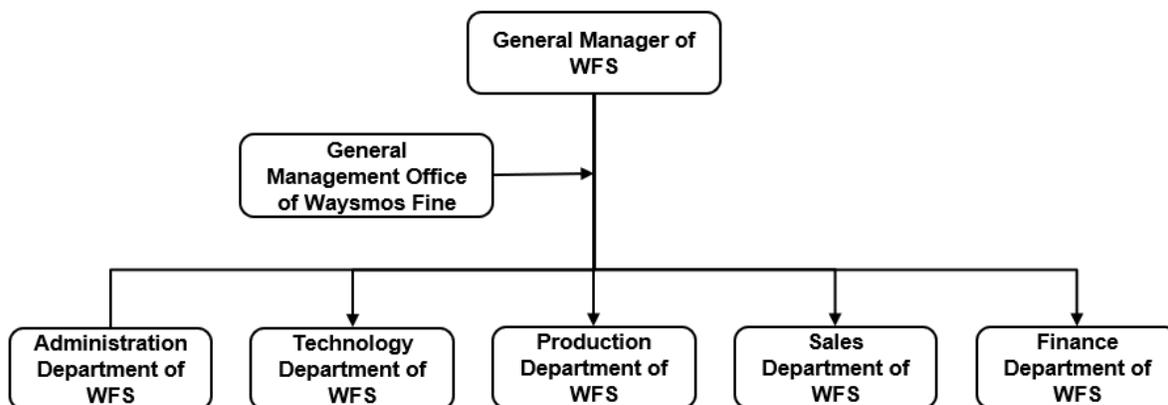
The influence of current project operation on surrounding communities are limited, and the nearest scattered rural residents is about 500m from the site. A concentrated residential areas are more than 2 kilometers away from the site. WFS has yet to establish community grievance mechanism, nor has actively disclosed the mechanism to surrounding communities. According to the consultation with the management personnel, the surrounding communities did not appeal any grievances against WFS to date. The management of WFS believes that they have no opportunity or needs to keep in touch with surrounding communities so far. If necessary, WFS

will carry out community communication with the help of the Management Committee of Laogang Industrial Park.

5.5 Management System

WFS has established internal environment, occupational health, safety and social management system in accordance with relevant laws and regulations. This system relies on the existing management structure of WFS (**Figure 5-1**). Mr. Ye Mingsheng, the general manager, is responsible for the overall supervision. Mr. Fei Weimin, the manager of technology department, is responsible for the specific management, and all department managers are responsible for the implementation. The technology department is responsible for routine E&S management. WFS is small in enterprise size, has fewer employees (8 employees including 3 production workers), has simple production process, and is located in the same compound with Waysmos Fine. The General Office of Waysmos Fine provides technical and resource support for WFS in terms of daily operation management and emergency response.

Figure 5-1: Management System Structure



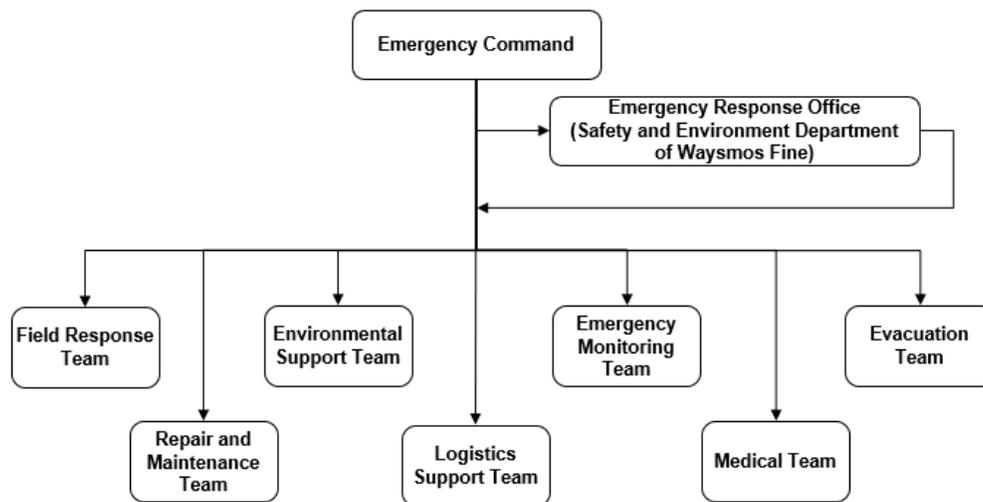
WFS has developed a series of environmental and social management systems, covering risk identification, risk mitigation measures and implementation, emergency response and other elements. Key environmental and social management systems include:

- Identification and evaluation control procedures
- Wastewater, exhaust gas, solid waste management system
- Environmental health management system
- Energy resource management program

- Corporate energy management standards
- Company energy saving management system
- Labor protection products and health care products management system
- Occupational hazard control management system
- Occupational health management standards
- Safety production objectives, responsibility system, assessment, reward and punishment management system
- Work safety responsibility system
- Safety training and education system
- Construction project "three simultaneous" safety management system
- Special equipment management system
- Hazardous chemicals management system
- Fire safety management system
- Risk assessment and control management system
- Emergency rescue management system
- Production safety accident or major incident investigation and report processing system
- Special operation personnel management system
- Human resource management procedures
- Payroll attendance management procedures

As mentioned above, WFS and Waysmos Fine share a set of emergency management organization to deal with environmental emergencies and production safety accidents. **Figure 5-2** shows the structure of the emergency management organization. WFS has prepared its own production safety accident emergency plan, which relates to Waysmos Fine emergency plan. However, WFS has not prepared its own emergency plan for environmental emergencies, and directly used the plan of Waysmos Fine. However, the plan is not targeted at the specific production activities and environmental risks of WFS, so WFS still needs to prepare its own emergency plan for environmental emergencies and integrates it with Waysmos Fine's emergency plan for environmental emergencies purpose.

Figure 5-2: Emergency Management Organization Structure



In case of general emergencies, the on-site alarm system and operation workers shall detect them as soon as possible and take effective measures to deal with them in time. When serious emergencies occur, although the on-site alarm system and operation workers can find it in time, it may be difficult to control the emergencies for a while. These serious emergencies shall be dealt with it in accordance with the procedures including alarm, alarm reception, alarm judgment, emergency start, emergency end and later disposal. WFS has been equipped with corresponding emergency supplies and equipment under the assistance of Waysoms Fine. The emergency response procedures are summarized as follows:

1. After finding an emergency environmental incident or production safety accident, the personnel who observe the incident/accident shall immediately report to the safety and environmental department of the company (daytime) or the south guard (night) for emergency alarm; The company's safety and environment department or south guard first contact the incident unit related personnel to the scene to confirm the accident, and notify the company's emergency headquarters, decided to immediately start the company-level emergency plan;
2. According to the on-site investigation, the company's emergency headquarters shall produce emergency treatment measures and plans (how to cut off pollution sources, self-protection of emergency team personnel, inert material adsorption, water spraying dilution, firefighting, accident wastewater management, pump start-up, etc.) and organize all emergency teams to implement emergency response plans; At the same time, contact the park environmental protection, safety supervision, fire protection and other related departments, and report the accident to the relevant management department;

3. The site command group is responsible for directing the emergency shutdown of the production device, coordinating and organizing the emergency teams to deal with the emergency and control the further expansion of the accident
4. The on-site disposal team is responsible for selecting appropriate tools (such as plugging agent, pipe clamp, sandbag, etc.) to cut off the pollution source in time. When there is a vacuum system near the leakage source, the pollution source shall be transferred to the accident tank by vacuum, and the remaining solution shall be transferred to the backup container for storage to reduce the amount of leakage; When the leakage amount is too large to adsorb, it will pollute the surrounding atmosphere and water environment or cause fire accidents, fire water must be used to extinguish fire and dilute pollutants, and at the same time to cool the leakage and surrounding containers, so as to avoid more severe fire or explosion accidents. At the same time, sandbags shall be used to block the outlet of clean water and the polluted surrounding water environment (enclosed in a closed loop) to prevent accidents and firefighting wastewater from spilling into the whole plant or leaking out of the plant through the clean water pipe network.
5. The disposal group is responsible for the effective treatment of the leakage pollution sources in the accident area, and shall select correct interception, disposal, absorption measures (activated carbon, yellow sand, soil, coal cinder, lime, etc.) and equipment, agents, so as to further reduce pollutants. It is also responsible for wastewater drainage process switching from normal to accident drainage condition, to discharge accident leakage, firefighting wastewater, wastewater of rinsing the container/device of accident into the emergency pool (wastewater adjusting pool), when the water flow is too large, it shall be pumped to the company's emergency pool in time, and be further recovered, removed and treated. The disposal group is responsible for the further disposal of the accident site, storing hazardous wastes that intercept, dispose of and adsorb pollution sources in lined plastic bags and recording the situation, and then sending them to the hazardous waste warehouse for storage, and recording them in storage at the same time. They are also responsible for the treatment of the wastewater from the emergency pool according to the results of the emergency monitoring group. If the test results show that the wastewater reaches the standard of the inlet of wastewater treatment plant, it will be directly injected into the wastewater pool and sent to the wastewater treatment plant for further treatment; If the test results are in line with the standards of clean water drainage, it will be discharged directly from the water outlet; otherwise stored in the wastewater tank, waiting for the superior or the same industry professional instructions for further treatment.

6. The emergency monitoring group is responsible for making the emergency monitoring plan according to the on-site leakage situation, monitoring the wastewater and exhaust gas in the potentially affected areas of the accident site, informing the emergency headquarters of the accident pollution situation according to the monitoring results, and assisting the disposal group to do the disposal work.
7. The alert evacuation group arrives at the accident site, places warning signs and demarcates warning areas, forbidding any irrelevant personnel and vehicles to enter; organize irrelevant personnel to evacuate the accident site immediately. Those who enter the warning area shall wear protective masks or air respirators and be accompanied by relevant personnel.
8. The medical rescue team is responsible for assisting the injured at the scene of the accident.
9. The logistics support group is responsible for the supply of rescue materials and equipment in the emergency rescue, as well as the organization of communication, evacuation and resettlement of personnel and the deployment of vehicles at accident site.
10. After environmental protection, fire control or superior emergency command group arriving, the on-site commander will transfer emergency work to the superior emergency command group, cooperate with the relevant departments of emergency treatment, to prevent secondary environmental pollution accidents at the same time.
11. Accident site protection and site cleaning work

Protection measures at accident site

The alert evacuation group is responsible for pulling the warning line, strengthening the protection of the accident site, and forbidding irrelevant personnel to enter; protect damaged equipment parts, fragments and residues and their locations at the accident site; all items collected on site shall be labeled with description of location, time and manager; the collected objects shall be kept as origin, and it is not allowed to be washed and wiped, especially in the case of a significant accident or above, the site can be cleaned only after the relevant departments of higher level investigating and obtaining evidence.

Site cleaning work

On-site cleaning work shall be conducted by the safety and environmental division, accident departments. Only emergency rescue personnel from accident departments and designated volunteer fire brigade members who have participated in training can participate in the cleaning work.

5.6 Findings and Action Plan

During this audit, the main environmental and social findings identified in WFS are shown in **Table 5-4**.

Table 5-4: Environmental and Social Findings

No	Topic	Finding	Suggestion	Responsible Party	Suggested Completion Time	Completion Index	Current Compliance Status
1	Emergency plan for environmental emergencies	WFS and Waysmos Fine share a set of emergency management organization to deal with environmental emergencies and production safety accidents because they locate in the same factory. However, WFS has not prepared its independent emergency plan for environmental emergencies, who directly used Waysmos's, and the plan is not targeted at the specific production activities and environmental risks of WFS, so WFS still needs to prepare its own emergency plan for environmental emergencies. environmental emergency plan.	WFS shall prepare its independent environmental emergency plan (which shall be integrated with the emergency plan of Waysmos Fine) and go to the local ecological and environmental management department for record.	WFS	3 months	Emergency plan for environmental emergencies, and the record certificate	WFS has signed a contract with a third-party vendor. The preparation of the independent environmental emergency plan is on-going. It is expected to be completed in December 2021.
2	Chemical management	WFS has not posted the corresponding chemical substance safety information form in the use area or storage area of some chemicals.	WFS shall strengthen the management of chemicals and post the corresponding chemical safety information sheet in the chemical use area or storage area.	WFS	3 months	Related photos and inspection records	WFS has posted the chemical safety information sheet in the chemical use/storage area. In compliance with WB's policies and local regulatory requirement.

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No	Topic	Finding	Suggestion	Responsible Party	Suggested Completion Time	Completion Index	Current Compliance Status
3	Occupational health	Assessment and acceptance of the control effect of occupational hazard and its declaration have not been completed, and three employees exposed to occupational hazard factors have not been examined for their occupational health.	WFS shall entrust a qualified third-party organization to carry out the occupational hazard control effectiveness assessment or the assessment of the status quo, complete the occupational hazard declaration according to the assessment conclusion (WFS promises to complete the occupational hazard control effect assessment and related completion acceptance inspection, as well as the occupational hazards declaration by the end of December 2021), and organize the employees exposed to the occupational hazard factors to have occupational health examination (WFS promises to organize the occupational health examination within one month after the completion of the occupational disease hazard control effectiveness assessment and related completion acceptance inspection procedures).	WFS	3 months	Occupational hazard control effect assessment, Inspection of occupational-hazard factors, occupational hazard declaration record, and occupational health check plan and records	WFS has signed a contract with a third-party vendor. The preparation of the occupational hazard control effectiveness assessment report is on-going. It is expected to be completed in December 2021. WFS will perform the occupational hazard declaration and occupational health check after completing the occupational hazard control effectiveness assessment.
4	Occupational health	The existing employee training plan is lacking the training content of occupational hazard prevention. According to the consultation with staff, WFS did not provide any occupational health training.	WFS shall make occupational health training plan according to the actual situation of occupational diseases and deliver training program to employees according to the plan (WFS promises to organize the training within one month after the completion of the occupational disease hazard control effectiveness assessment and related completion acceptance inspection procedures).	WFS	3 months	Training plan, training records	WFS will provide the training after completing the occupational hazard control effectiveness assessment. It is planned to be carried out from Feb.to May. 2022.

Waysmos Fire Suppression-Project of Reduction and Phaseout of PFOS in Priority Sectors in China -ESMP

No	Topic	Finding	Suggestion	Responsible Party	Suggested Completion Time	Completion Index	Current Compliance Status
5	Grievance mechanism	<ul style="list-style-type: none"> WFS has established an internal appeal mechanism and procedure but does not have a text record of the opinions, feedback, and processing results of the employees. WFS has not yet established a surrounding community grievance mechanism. 	The employee grievance mechanism shall be further improved to record the appeal processing results. In addition, a community grievance mechanism shall be established and with a text record.	WFS	1 months	Written documents of the grievance mechanism , and the written complaint record.	WFS has established a community grievance mechanism. In compliance with WB's policies and local regulatory requirement.

6. INTRODUCTION OF THE PILOT PROJECT

WFS submitted the implementation plan of the pilot project to FECO in June 2021. The main objectives of the pilot project are summarized as follows:

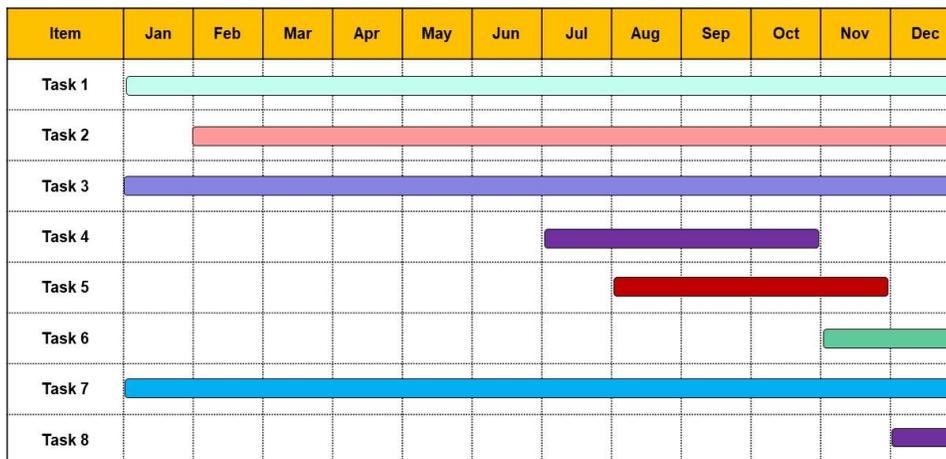
- Development of the PFOS-free foam fire extinguishing agents.
- Trial production of the PFOS-free foam fire extinguishing products.
- Testing and evaluation of the PFOS-free foam fire extinguishing products.
- Replacement of the PFOS-containing foam fire extinguishing products.

The main tasks of the pilot project are summarized as follows:

- Task 1: Research and development of the PFOS-free foam fire extinguishing agents.
- Task 2: Replacement of production equipment and trial production.
- Task 3: Quality control of the trail production.
- Task 4: Testing and evaluation by third parties.
- Task 5: Fire extinguishing experiments.
- Task 6: Replacement of the PFOS-containing foam fire extinguishing products.
- Task 7: Promotion of PFOS-free products.
- Task 8: Closure of the pilot project.

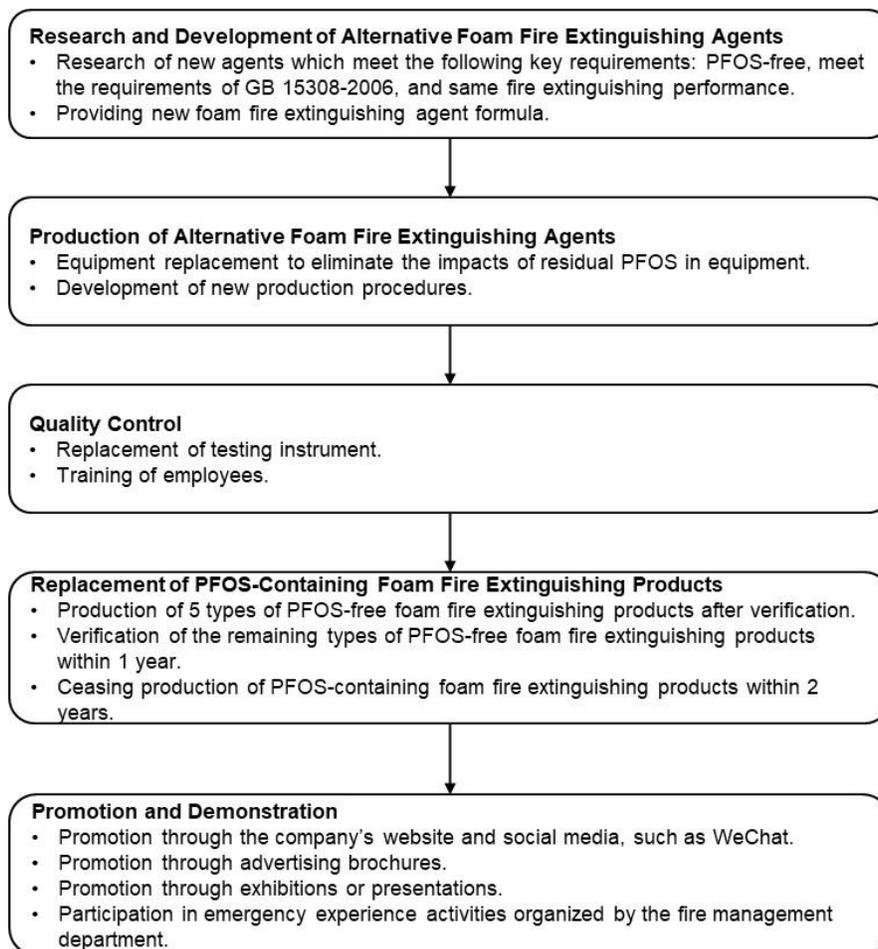
It is expected to complete the proposed tasks within one year. The proposed timeline of the pilot project is shown in **Figure 6-1**.

Figure 6-1: Proposed Timeline of the Pilot Project



The technical route of the pilot project is shown in **Figure 6-2**.

Figure 6-2: Technical Route of the Pilot Project



All the three foam fire extinguishing agent production lines of WFS will be included in the pilot project, according to the consultation with WFS representatives. The main proposed activities of the pilot project are summarized as follows:

Research and Development of Alternative Foam Fire Extinguishing Agents and Trial Production

- A total of five types of PFOS-free foam fire extinguishing agents, including 3% (AFFF, -1°C), 6%(AFFF, 0°C), 3%(AFFF/AR, 3°C), 6%(AFFF/AR, -1°C) and 3% (AFFF, -6°C) will be developed.
- The FPOS-free fluorosurfactant and other surfactants, auxiliary foaming agents, co-solvents and other additives will be mixed in different ratios to produce FPOS-free foam fire extinguishing agents. Except for the FPOS-free fluorosurfactants, all other chemicals are in use during the existing production process.

- The newly developed FPOS-free foam fire extinguishing agents will be screened via preliminary fire extinguishing testing in the laboratory of WFS. The FPOS-free foam fire extinguishing agents passing the preliminary screening will be used for trial production with a minimum amount of 2,000 kilograms (kg). The trial products will be submitted to national qualified third-party testing institution for further testing.
- The FPOS-free foam fire extinguishing agents will be determined if the trial products pass the further testing carried out by the qualified third-party testing institution. Then the standard production procedures, material procurement procedures, process inspection procedures, and testing procedures will be developed to maintain the consistency of the product quality. The training will be also provided to related employees of WFS.

Replacement or Addition of Equipment

- The equipment of the three existing production lines (such as the mix tank, piping and valves) for the PFOS-containing foam fire extinguishing products will be replaced by new ones, because the residual PFOS substance on the inner walls of the equipment are hard to be cleaned, and may affect the PFOS detection results of the newly developed foam fire extinguishing products. In addition, some testing or analytical instrument will be replaced or be added. The equipment proposed to be replaced or added are listed in **Table 6-1**.

Table 6-1: List of Equipment to be Replaced or Added

No.	Equipment	Category	Quantity	Model
1	Water treatment system (including water filter, ion exchanger and UV sterilizer)	Replaced	1 Sets	/
2	Mixing tanks, and affiliated paddles and heating features	Replaced	3 Set	7500 liters, stainless steel tanks; 3hp 45/22.5 rpm, 5/2.5hp paddles, 2hpvariable speed paddles.
3	Feeding pumps	Replaced	1 Set	50gpm, stainless steel pump
4	Transportation pumps and affiliated piping	Replaced	3 Sets	50gpm, 50mm inside diameter
5	Ball valves of transportation system	Replaced	30 Sets	/
6	Packaging machine and affiliated electronic scale	Replaced	1 Set	300kg, maximum scale
7	Pumps of packaging system	Replaced	3 Sets	50gpm, stainless steel pump
8	Forklift	Replaced	1 Set	/
9	Freezing point tester	Replaced	1 Set	/
10	Freezer	Replaced	1 Set	/
11	Electric heating blast drying oven	Replaced	1 Set	/
12	Viscometer	Replaced	1 Set	/
13	pH meter	Replaced	1 Set	/
14	Tensiometer	Replaced	1 Set	/

15	Spray gun, drain tank	Replaced	1 Set	/
16	Balances, dryers, etc.	Replaced	1 Set	/
17	Small fire extinguishing system	Replaced	1 Set	/
18	PFOS analytical instrument	Added	1 Set	/

Replacement of PFOS-Containing Foam Fire Extinguishing Products

- The five types of FPOS-free foam fire extinguishing agents will be submitted to China Certification Center for Fire Products of the Ministry of Emergency Management (CCCCF), a national qualified third-party testing institution, for testing, including the fire-fighting experiments under physical fire scenarios, to verify the reliability of the new products. Then obtain the type inspection report and voluntary certificate of the new products from the CCCC. It shall be noted that the CCCC will be responsible for the fire-fighting experiments under physical fire scenarios, WFS will not be involved in the experiments except providing FPOS-free foam fire extinguishing products, and obtaining the report after the experiments.
- After passing the aforementioned testing, the FPOS-free foam fire extinguishing agents will be put into mass production to replace the FPOS-containing products completely.

Promotion and Advertising

- The FPOS-free foam fire extinguishing products will be promoted through the company's website, social media (e.g., WeChat), advertising brochures, exhibitions and presentations.

7. MANAGEMENT ORGANIZATION SETTING

Many participants are involved in the implementation of this pilot project. To achieve the smooth progress of this pilot project and ensure that the project complies with the WB's environmental and social standards and China's regulatory and policy requirements, the pilot project plans to set up a project management mechanism consisting of the following parties.

FECO : It is the overall project management office (PMO) of this pilot project, and is generally responsible for the implementation of the project to meet the requirements of WB's standards and Chinese regulations and policies.

Local functional departments (Laogang Industrial Park Management Committee, Pudong New District Urban Management Administrative Law Enforcement Bureau Ecological Environment Law Enforcement Detachment, etc.): Responsible for the daily management and supervision of WFS.

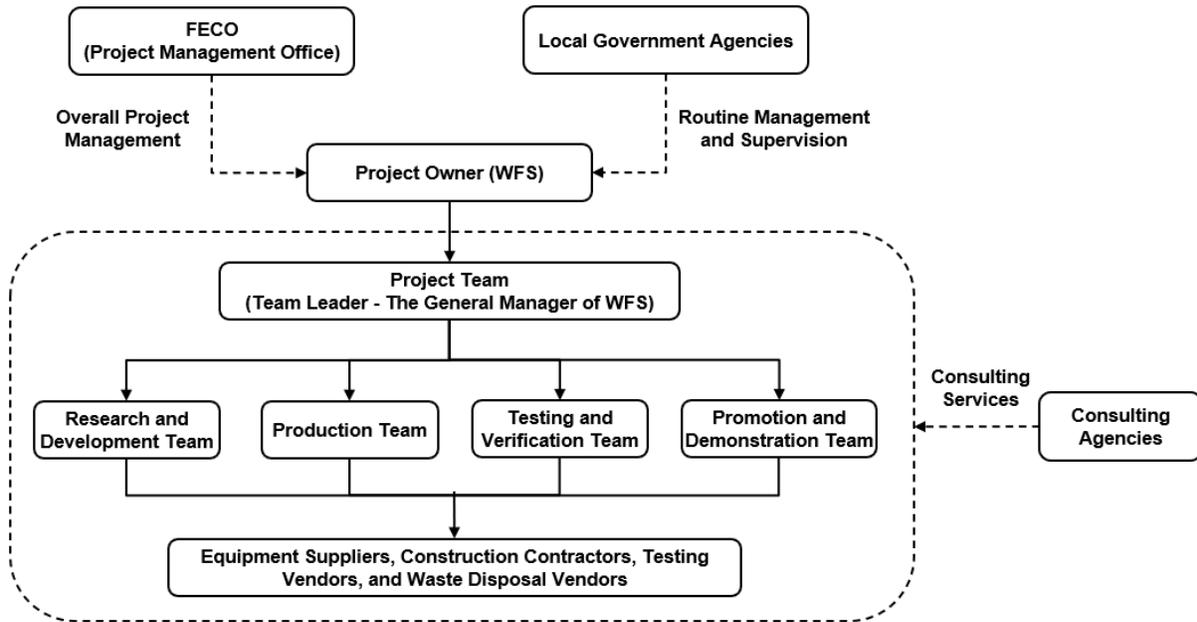
WFS: It is the main body of implementation of this pilot project, responsible for formulating and organizing the implementation of PFOS reduction and elimination project plans, performing duties according to the environmental and social management plan. It also takes the main responsibility for emergency management, waste disposal, monitoring and reporting, etc. WFS entrusts the construction vendors for specific implementation of relevant construction content, entrusts hazardous waste treatment and disposal vendors for waste disposal, and entrusts independent monitoring vendors to monitor and issue reports. WFS will set up a special project team, with the general manager responsible for project management and external liaison. The project team has four teams for formula development, manufacturing, testing and evaluation, and project promotion, responsible for specific implementation.

Equipment suppliers, construction contractors, testing vendors, waste disposal vendors: They are responsible for providing production equipment, testing equipment and materials according to the project implementation plan of WFS, and carrying out corresponding equipment removal, cleaning, installation, testing, waste disposal, etc.

Consulting agencies (Nanjing Fire Equipment Co., Ltd., Stantec Co., Ltd., etc.): They are responsible for the whole process of project implementation, providing technical, environmental and social management consulting services for WFS.

The system structure of the project management agencies of this pilot project is shown in **Figure 7-1**.

Figure 7-1: Schematic Diagram of the System Structure of the Project Management Agencies



In addition, the WB's Safeguard Team will also conduct overall supervision of the pilot project's environmental and social management.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

In accordance with the project activities described in Section 7, this section assesses the environmental and social impacts involved in the pilot project activities.

8.1 Environmental and Social Impact Assessment

This pilot project activities which may involve of environmental and social impact are: (1) PFOS alternative formula research and development, (2) product performance test (3) the removal of production equipment and production equipment replacement, 4) pilot project trial production. This pilot project production line will continue using existing foam extinguishing agent project, which does not involve new plant or new land, and does not increase or decrease staff strength. The potential environment, occupational health and safety (OHS) and risks involved in different stages of the pilot project are described in the following paragraphs.

PFOS alternative products formula research and development and product performance test stage

At present, the design formula of this pilot project including fluorine surfactant Capstone (R) 1470, diethylene glycol butyl ether, Agnique sls1030 (10 caron sodium sulfate, alkyl glycoside APG0810, urea, EDTA, diammonium phosphate and xanthan gum, the final formula is still to be determined. The 7 kinds of chemical material safety information data are shown in **Table 8-1**, they all belong to the general chemicals, and those chemicals are already used as raw material in the existing production, but the proportion of reagents in alternative products will be different in the pilot project, fluorine surfactant Capstone (R) 1470 will be used to replace the surfactant (VF368) containing PFOS in the original process.

Table 8-1: Alternative Product Formula Components

Name	Component	Physical/Chemical Hazard	Environmental Hazard	Chemical Type	Annual Usage (ton)
Diethylene glycol butyl ether	Diethylene glycol butyl ether	Can irritate the skin and eyes, may be harmful when contact with the skin	Not classified as persistent, bioaccumulation and toxic. Do not pour into any sewers, ground, or into any water body. All disposal operations must comply with local regulations.	General chemicals	48
Fluorine surfactant Capstone(R)1470	Fluorinated surfactants, hexene glycol, 1,2-propylene glycol, sodium hydroxide	Swallowing can be harmful; inhalation can be harmful. Inhalation of high concentrations of decomposition products can cause shortness of	Harmful to aquatic life	General chemicals	15

Name	Component	Physical/Chemical Hazard	Environmental Hazard	Chemical Type	Annual Usage (ton)
		breath (pulmonary edema). Inhalation of aerosols or fine sprays can cause serious respiration problems			
Agnique sls1030	Decyl sodium sulfate, water	Eating is harmful, irritating to the skin and significant danger to the eyes	/	General chemicals	45
Alkyl glycoside APG0810	D - pyran glucose, oligomer, decyl octyl glucoside, water	significant danger to the eyes	/	General chemicals	9
Urea	Urea	Can irritate the eyes, skin, mucous membrane	May have harm to the environment, can cause water pollution	General chemicals	3
Diammonium phosphate	Diammonium phosphate	There is mild irritation to the skin and mucous membranes, and inhalation or ingestion in the body can cause severe diarrhea irritation to the skin, Lifting the eyes can cause irritation, redness and pain	/	General chemicals	6
EDTA	Tetrasodium Ethylenediaminete traacetate Tetrahydrate	Swallowing is harmful, inhalation is harmful, and can cause serious eye injury	/	General chemicals	1
Xanthan gum	Xanthan gum	/	/	General chemicals	1

For the research and development of PFOS phase-out products, it is necessary to carry out the corresponding product formulation test in the laboratory, and conduct preliminary selection by the performance of foaming, liquid analysis, aging, freezing and melting according to the relevant requirements of national standard GB15308-2006. The initially selected products will be tested in small fire extinguishing experiments. Small firefighting experiments will be carried out in the special fire scene setting area in the laboratory (covering an area of about 0.25 square meters). The simulated fire will be extinguished with new formula products to verify the effectiveness of the product. If the experimental results meet the technical requirements, a trial production of no less than 2000kg will be conducted, and the product will be sent to a qualified third party for testing as per GB14308-2006 requirements. The main environmental impact in this process is that the experimental wastewater produced by formula preparation and container cleaning, and each time of the fire extinguishing test will produce about 20 liters of wastewater. The specific number of

tests cannot be determined yet. The main pollutants in the experimental wastewater are surfactant, it will be collected in buckets and discharged into the existing sewage pipeline in the plant. Because the product experiment of this pilot project and of existing project are basically the same, which produces no new pollutants, so the laboratory wastewater and firefighting experimental wastewater can be discharged to Waysmos Fine wastewater treatment station for preliminary treatment, and then discharged to Nanhui Binhai Wastewater Treatment Plant.

After passing the third-party testing and evaluation accordance with GB15308, CCCF will carry out fire extinguishing testing for different models of trial production products in the physical fire scenes to further verify the fire extinguishing effect and performance of the product. CCCF is a professional agency authorized and approved by the China National Certification and Accreditation Administration Commission to take the following responsibilities: (1) implementation of the compulsory or voluntary certification of fire products, and technical appraisal of fire products in China; (2) development and implementation of fire protection product conformity assessment standards, implementation rules and technical guidelines; (3) Implementation of international mutual recognition of fire protection product conformity assessment in accordance with the laws and regulations, management of the expert group of China's compulsory fire protection product certification, participating in various sub-technical committees of the national fire protection standardization technical committee; and 4) providing quality information of fire protection product certification and technical appraisal for the fire protection departments, product quality supervision, inspection and quarantine departments, and the general public.

According to the project implementation plan, the physical fire scene fire extinguishing testing is carried out by Fire product conformity assessment center, WFS is only responsible for providing foam fire extinguishing agent and does not participate in the specific experimental process, the testing results can be obtained after testing. Its environmental and social impact assessment is therefore not within the scope of this report.

During the research and development of PFOS alternative product formulation and product performance testing, the main occupational health risks are related to the chemicals used during the R & D and testing process, as well as 120 # rubber solvent oil used as fuel for fire extinguishing experiments. Except for the fluorine surfactant Capstone (R) 1470, the remaining chemicals were consistent with those used in the existing production process of WFS.

The fluorosurfactant Capstone (R) 1470 is a general chemical, swallowing and inhalation this chemical can be harmful, eating this chemical is harmful, and this chemical is irritating to the skin

and eyes. The hazard type and degree are similar to the chemicals currently used by WFS. Therefore, it can be managed in accordance with the current occupational health risk control system of WFS. All employees shall be equipped with protective masks, protective glasses, protective gloves, work clothes and other PPE. In addition, the work site shall also be equipped with emergency spray and eye washing facilities.

In this stage, the main safety risks are electric shock, mechanical injury and fire accidents, which are the same as in the existing production process of WFS. Therefore, according to the existing safety management system, it can be controlled through strengthening the safety training and daily supervision of employees, improving the awareness of PPE wearing, increasing the daily inspection frequency of fire facilities and other aspects of the work.

The environmental and social impacts and mitigation measures in this stage are summarized in **Table 8-2**.

Table 8-2: Potential Environmental and Social Impacts and Mitigation Measures in Alternative Formula R&D and Performance Testing Stage

Factor	Impact	Mitigation
Wastewater	<ul style="list-style-type: none"> The cleaning wastewater and the fire extinguishing test wastewater produced during the experiment is basically consistent with the conventional experiment of the existing project. 	<ul style="list-style-type: none"> The laboratory wastewater is discharged to the wastewater treatment station of Waysmos Fine and the wastewater is discharged to the Nanhui Binhai Wastewater Treatment Plant after the unified treatment. The water quality of the outlet of the wastewater treatment station in the plant shall meet the standards of Table 2 of Comprehensive Sewage Discharge Standard (GB8978-1996).
Storage and handling of chemicals	<ul style="list-style-type: none"> The chemicals used for the experiment are generally same as those used for conventional experiment of the existing project, except for the FPOS-free fluorosurfactant. 	<ul style="list-style-type: none"> Evaluate the corrosiveness, toxicity, flammability and reactivity of the newly introduced chemicals according to the chemical safety instructions. Provide chemical safety information sheet in the chemical use area or storage area. Provide training and appropriate PPE to employees who may expose to the chemicals.
Solid waste	<ul style="list-style-type: none"> Waste chemicals and materials generated during the experiment are generally same as those generated during the current experiment. 	<ul style="list-style-type: none"> Hire local qualified vendors for the waste transportation and disposal. These vendors need to be qualified by local government agencies, with valid certificates.
Occupational health	<ul style="list-style-type: none"> Occupational health hazards of staff exposure to chemicals. 	<ul style="list-style-type: none"> Before starting the research and development test, evaluate the occupational hazard of the proposed new fluorine surfactant, give priority to the chemicals with less human health risk, and take appropriate occupational hazard protection

Factor	Impact	Mitigation
		measures (e. g.: PPE, ventilation facilities, etc.) according to the assessment results. <ul style="list-style-type: none"> • Train employees on occupational hazard protection to understand occupational disease hazard, protective measures and emergency disposal measures. Provide applicable PPE to staff. Organize the employees to participate in the occupational health checks.
Safety	<ul style="list-style-type: none"> • Electric shock, mechanical damage, fire risk. 	<ul style="list-style-type: none"> • According to the existing safety management system, strengthen the safety training and daily supervision of the staff. • Help employees improve the awareness of wearing PPE and provide applicable PPE to employees regularly according to the identified safety risks. • Conduct regular inspection on the existing firefighting facilities (fire hydrants, mobile fire extinguishers, etc.) to ensure their effectiveness.
Social	<ul style="list-style-type: none"> • Formula development process may have effects on the occupational health and safety of workers; project does not add new land, and it will produce no land impact; • The project is located in the industrial park, and there is no obvious social sensitivity point around it, and there is no impact on the nearby community. 	<ul style="list-style-type: none"> • Strictly implement the above requirements for OHS.

Removal and replacement of the production equipment and facilities stage

According to the project implementation plan and consultation with management personnel, WFS has three foam extinguishing production lines at present. This pilot project plans to adopt the unified replacement of raw materials, facilities and equipment, which does not involve large-scale construction activities, and does not involve large-scale entry of construction personnel. Accordingly, the pilot project is expected to have little impact on the surrounding communities. The equipment list for removal and replacement is shown in **Table 6-1** in Section 6 of this report.

The pilot project will have environmental impacts such as wastewater, solid waste and noise during this stage.

In terms of wastewater, the process will produce cleaning wastewater containing chemicals, the generated amount can be estimated as 15% of the dismantling equipment, the cleaning

wastewater produced during this stage is about 22.2 tons; the domestic wastewater production of the construction personnel is about 45 liters / day. The equipment cleaning wastewater and domestic wastewater will be collected and discharged into Waysmos Fine wastewater treatment station through the "hydrolysis acidification + contact oxidation" process, then will be discharged into the municipal pipe network into the Nanhui Binhai Wastewater Treatment Plant, the outlet water quality of the plant wastewater treatment station shall meet the requirements of Class III standards in Table 2 of the Comprehensive Sewage Discharge Standard (GB8978-1996).

As solid waste, the main pollutants produced are waste equipment and household waste of construction personnel, which are general solid waste. The waste equipment generated is about 6 tons, and the household waste of the construction personnel is about 0.5 tons. The waste equipment can be treated by a qualified solid waste recycling and disposal as the recyclable industrial solid waste or other types of solid waste. The household garbage is treated by the original disposal method, which is uniformly transported and disposed by Laogang City Appearance and Sanitation Institute after collection by the factory.

Noise is mainly the construction noise generated during equipment removal, and there are no sensitive points around the project. Therefore, the noise has little impact on the surrounding environment. The pilot project shall focus on reducing the noise impact of noise on construction personnel.

The equipment removal and replacement stage is the stage with highest risk of the health and safety in this pilot project, and the construction contractor shall follow the relevant requirements of the construction and removal of the General Environment, Health and Safety Guidelines of the WB.

The main occupational health hazard at this stage are the dust, residual chemicals, and noise generated during the removal process. Workers may have health problems from exposure to the hazard factors mentioned before. Therefore, full-time or part-time occupational health administrators must be designated responsible for occupational health management in the construction stage. Construction personnel shall be trained on occupational health related topics regularly. In the removal of equipment and replacement, workers shall wear corresponding PPE, such as protective masks, protective glasses and protective gloves according to the hazard factors. In addition, the work site shall also be equipped with emergency spray and eye washing facilities.

The main safety hazard at this stage include fire, lifting injury, mechanical injury, electric shock, fall from high place and object strike, vehicle injury, etc. Therefore, full-time or part-time safety administrators must be designated responsible for site safety management in the construction stage. They shall conduct safety training to the construction personnel regularly, standardize the operation process of the construction personnel, and control the time of continuous work. For high-risk operations such as fire, climbing and hoisting, the operation permit system shall be implemented, and appropriate hazard prevention measures shall be taken. Strengthen the supervision of the construction personnel correctly wearing PPE, enhance the maintenance of equipment and tools, to ensure that they are in a good working condition.

Environmental risk and environmental emergency response: In the process of equipment removal and cleaning, there is a risk of hazardous waste / chemical leakage. Due to the small content of hazardous waste and chemicals involved, the probability of this risk is low. It is recommended that the residue in the equipment should be cleaned to no residues before the equipment is removed, and the relevant residues and waste solvents and waterwater should be properly disposed of; flames is prohibited during this stage. In case of leakage, only trained personnel with appropriate PPE can handle and clean the leaked hazardous wastes/hazardous chemicals. Untrained personnel shall keep a safe distance from the leaking site. The transportation of hazardous wastes/chemicals must be carried out by qualified vendors, and the transportation routes shall avoid sensitive points such as water sources. If the leaked hazardous wastes/chemicals are highly toxic and highly volatile, emergency evacuation and rescue measures shall be arranged immediately. Places contaminated by hazardous wastes/chemicals shall be cleaned up in time, and the waste generated in the cleaning process shall be treated as hazardous waste.

The potential environmental and social impacts and mitigation measures during the removal and replacement of the equipment in the pilot project are shown in **Table 8-3**.

Table 8-3: Potential Environmental and Social Impacts and Mitigation Measures During the Equipment Removal and Replacement

Factor	Impact	Mitigation
Wastewater	<ul style="list-style-type: none"> The wastewater containing PFOS pollutants generated by the equipment cleaning process is about 22.2 tons; Domestic wastewater generated by the construction personnel 	<ul style="list-style-type: none"> The equipment cleaning wastewater and domestic wastewater shall be collected and discharged into Waysmos Fine wastewater treatment station and treated through the "hydrolysis acidification + contact oxidation" process, then discharged into the municipal pipe network into the Nanhui Binhai Wastewater Treatment Plant, the outlet water quality of the plant wastewater treatment station shall meet the requirements of Class III standards in Table 2 of the

Factor	Impact	Mitigation
	is about 45 liters / person / day.	Comprehensive Sewage Discharge Standard (GB8978-1996).
Solid waste	<ul style="list-style-type: none"> Domestic waste generated by the construction personnel is about 0.5 tons; Waste materials and equipment, about 6 tons. 	<ul style="list-style-type: none"> Domestic garbage is collected by the factory and transported and disposed of by Laogang City Appearance and Sanitation Institute The waste equipment can be treated by a qualified solid waste recycling and disposal as the recyclable industrial solid waste or other types of solid waste according to the actual situation.
Noise	<ul style="list-style-type: none"> The maximum construction noise generated during equipment removal is about 80 db. 	<ul style="list-style-type: none"> The pilot project shall explore more environment friendly and less impact approaches for scheme design and technology, especially the construction process that may produce noise. Relevant engineering measures shall be further discussed to reduce the noise impact on construction personnel. Avoid night construction.
Occupational health	<ul style="list-style-type: none"> Construction workers are exposed to occupational health hazards caused by dust, chemicals, noise, etc 	<ul style="list-style-type: none"> The pilot project shall establish and improve the occupational health protection mechanism, and designate full-time or part-time occupational health administrators to be responsible for the occupational health management in the construction stage. Train the construction personnel on occupational health-related topics regularly, and keep the training records. The pilot project shall help construction personnel strengthen the awareness of wearing PPE, and distribute PPE to the construction personnel of different types of work according to the occupational hazard factors identified.
Safety	<ul style="list-style-type: none"> Potential safety risk factors such as fire, lifting injury, mechanical injury, electric shock, falling from height and object strike, and vehicle injury during the construction process 	<ul style="list-style-type: none"> The pilot project shall establish and improve the production safety mechanism. The production department shall conduct production safety related theme training for the construction personnel and keep the training records. Standardize the operation process of construction personnel, control continuous working hours (e. g. implement rotation working system, arrange rest time and extension time). Work permit system shall be implemented for high-risk operations (fire, climbing, hoisting, etc.). Strengthen the supervision on the wearing of PPE, and regularly maintain the equipment and tools to ensure that they are in good working condition.
Environmental risks and environmental emergency response	<ul style="list-style-type: none"> Leakage of chemicals or hazardous waste during cleaning equipment 	<ul style="list-style-type: none"> Before disassembly of equipment, the residue in the equipment must be cleaned, cleaned without residue before the equipment is removed, and the relevant residues and waste solvents, wastewater shall be properly disposed of. Ensure that the cleaning site is impermeable, and that all wastewater is collected. Flames is prohibited during this stage. Only trained personnel with appropriate PPE can handle and clean the leaked hazardous wastes/hazardous chemicals. Untrained personnel shall keep a safe distance from the leaking site. The transportation of hazardous wastes/chemicals must be carried out by qualified agency, and the transportation routes shall avoid sensitive points such as water sources. If the leaked hazardous wastes/chemicals are highly toxic and highly volatile, emergency evacuation and rescue measures shall be arranged immediately. Places contaminated by hazardous wastes/chemicals shall be cleaned up in time, and

Factor	Impact	Mitigation
		the waste generated in the cleaning process shall be treated as hazardous waste.
Social	<ul style="list-style-type: none"> • Social disturbance caused by transport vehicles during construction; • Noise impact during construction 	<ul style="list-style-type: none"> • Conduct regular monitoring of environmental impact, ensure that noise, exhaust gas and other pollutants meet the standards, and proactively disclose environmental impact monitoring results to the community. • Establish and implement an effective community grievance mechanism, and take the initiative to address complaints from community, respond to complaints from the community, and provide timely feedback to the complainants on the results of the processing, properly resolve residents' complaints and maintain appropriate records.

Trial production and formal operation stage

According to the managers consultation, this pilot project only involves replacing the original production equipment contaminated by PFOS material to the same type equipment excluding PFOS. The replaced equipment functions and models are basically unchanged in production, operation, and inspection process. Therefore, the environmental and social impacts of this pilot project mainly exist with the equipment removal and installation stage, in the production and operation process will not produce more environmental, OHS and social impact than the existing production activities. Environmental and social management and mitigation measures can be implemented in accordance with existing management systems.

According to the current operation analysis of WFS, the possible environmental impact in the trial operation of the pilot project is wastewater, noise, and solid waste, etc.

Wastewater mainly includes domestic wastewater and thick water from production. The wastewater will be collected and discharged into Waysmos Fine wastewater treatment station and treated through the "hydrolysis acidification + contact oxidation" process to achieve standard (Class III standards in Table 2 of the Comprehensive Sewage Discharge Standard (GB8978-1996)), then discharged into the municipal pipe network into the Nanhui Binhai Wastewater Treatment Plant for centralized treatment and discharge to water environment finally.

The noise of the operation stage is mainly generated by mixer, filling machine, vacuum pump, air compressor and other noisy equipment. As the equipment of the pilot project are basically same as WFS existing production project, there is no additional noise equipment, thus the noise impact

is basically same as the current situation. It is suggested that employees strictly follow the equipment operation manual to avoid additional mechanical noise caused by mechanical failure. Carry out noise monitoring at factory boundaries regularly to ensure the Class III standards of Environmental Noise Emission Standard of Industrial Enterprises (GB 12348-2008) are met.

The solid waste generated during the trial operation stage is mainly waste packaging buckets, waste packaging bags and household waste. Among them, the diethylene glycol butyl ether waste packaging bucket is a hazardous waste, and is estimated to be generated about 2 tons every year. WFS has signed a hazardous waste disposal agreement with the qualified Shanghai New Jinqiao Environmental Protection Co., Ltd., which will continue to transfer and disposal of the hazardous waste of WFS regularly. The amount of waste barrels and waste bags or raw materials are expected to be about 2 tons per year, they will be collected to the raw material manufacturer for recycling. The estimated amount of household waste is about 2.5 tons every year, which is uniformly transported by the Laogang City Appearance and Sanitation Institute to the Laogang Garbage Transfer Station for treatment.

During the trial operation of the pilot project, occupational hazard factors on the work site include noise and chemicals. Since low noise equipment has been considered in the equipment selection, and noise reduction and isolation measures are planned during the installation process, the noise level during the operation of the pilot project is expected to be similar to the current noise level. The site workers can further reduce the impact of workplace noise impact by wearing earplugs. In terms of chemicals, the chemicals for the production are general chemicals, and the production processes will be conducted in airtight containers and pipelines, in the meanwhile WFS has equipped its employees with protective masks, protective glasses, protective gloves, work clothes and other PPE, and the work site has been equipped with emergency spray and eye washing facilities, which can effectively control the health risks of chemicals.

The main safety risks in this stage of pilot project include mechanical injury, electric shock, fall from high place and fire accidents, which are the same as the existing project safety risks, so they can be controlled in accordance with the existing safety management system. During the pilot project trial operation stage, it is recommended to strengthen the training of site workers, enhance the maintenance of equipment and tools, to ensure that they are in good working condition. The site workers shall carry out safety self-inspection before starting the production day, and organize a comprehensive safety inspection every month to ensure timely detection of potential safety issues and complete rectification. Update the emergency plan for production safety accidents

timely, provide emergency rescue materials (such as fire sand, oil absorption cotton, fire extinguishers, etc.), and organize relevant drills.

The environmental emergencies during the pilot operation of this pilot project may be the leakage of chemicals, and the emergency response method is basically the same as the equipment removal and cleaning stage. Once the leakage occurs, only trained personnel with appropriate PPE can handle and clean the leaked hazardous wastes/hazardous chemicals. Untrained personnel shall keep a safe distance from the leaking site. The transportation of hazardous wastes/chemicals must be carried out by qualified vendors, and the transportation routes shall avoid sensitive points such as water sources. If the leaked hazardous wastes/chemicals are highly toxic and highly volatile, emergency evacuation and rescue measures shall be arranged immediately. Places contaminated by hazardous wastes/chemicals shall be cleaned up in time, and the waste generated in the cleaning process shall be treated as hazardous waste.

8.2 Monitoring Plan

According to the environmental and social impact analysis of the pilot project in Section 8.1, the corresponding environmental and social monitoring plans for the pilot project are shown in **Table 8-4**.

Table 8-4: Monitoring Plan

Stage	Factor	Monitoring Item	Characteristic contaminants	Applicable standard	Frequency
Formula research and development stage	Wastewater	Water quality of the sewage outlet in the plant area	pH, COD, BOD ₅ , NH ₃ -N, SS	Class III standards in Table 2 of Comprehensive Sewage Discharge Standard (1996)	Once at the mid-stage
	Occupational health	N/A	N/A	N/A	N/A
Equipment removal and replacement stage	Wastewater	Water quality of the sewage outlet in the plant area	pH, COD, BOD ₅ , NH ₃ -N, SS	Class III standards in Table 2 of Comprehensive Sewage Discharge Standard (1996)	Once at construction peak time
	Noise	Factory boundary noise	N/A	Class III Standards of Environmental Noise Emission in Industrial Enterprises (GB12348-2008)	Once at construction peak time
	Solid waste	Discarded equipment and household waste	Whether the waste equipment and household garbage are treated in compliance	Pollution Control Standard for General Industrial Solid Waste Storage and Disposal Site	Once at the construction period ends

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Stage	Factor	Monitoring Item	Characteristic contaminants	Applicable standard	Frequency
				(GB18599-2001)	
	Occupational health	N/A	N/A	N/A	N/A
Trial operation of the project	Wastewater	Water quality of the sewage outlet in the plant area	pH, COD, BOD ₅ , NH ₃ -N, SS	Class III standards in Table 2 of Comprehensive Sewage Discharge Standard (GB8978-1996)	Once at the mid-stage
	Noise	Factory boundary noise	N/A	Class III Standards of Environmental Noise Emission in Industrial Enterprises (GB12348-2008)	Once at the mid-stage
	Solid waste	Waste packaging bucket, household garbage	Whether diethylene glycol butyl ether waste packaging bucket and domestic waste are treated with compliance	Pollution Control Standards for Hazardous Waste Storage (GB18597-2001) and 2013 amendment list	Once at the mid-stage
	Occupational health	Workplace noise	8h equivalent sound level	Occupational Contact Limit for Workplace Hazardous Factors — Part 2 Physical Factors (GBZ 2.2-2007)	Once at the mid-stage
Formal operation stage	Wastewater	Water quality of the sewage outlet in the plant area	pH, COD, BOD ₅ , NH ₃ -N, SS	Class III standards in Table 2 of Comprehensive Sewage Discharge Standard (GB8978-1996)	Once per year
	Noise	Factory boundary noise	N/A	Class III Standards of Environmental Noise Emission in Industrial Enterprises (GB12348-2008)	Once per year
	Solid waste	Waste packaging bucket, household garbage	Whether diethylene glycol butyl ether waste packaging bucket and domestic waste are treated with compliance	Pollution Control Standards for Hazardous Waste Storage (GB18597-2001) and 2013 amendment list	Once per year
	Occupational health	Workplace noise	8h equivalent sound level	Occupational Contact Limit for Workplace Hazardous Factors - Part 2 Physical Factors (GBZ 2.2-2007)	Once per year
Project Lifecycle	Community Grievances	Number	NA	The World Bank	Semi-annually
	Staff	Number	NA	The World Bank	Semi-

Stage	Factor	Monitoring Item	Characteristic contaminants	Applicable standard	Frequency
	Grievances				annually

Note: The social and environmental monitoring report shall be produced at the time node of half a year, one year of the project and three months after the completion of the project.

8.3 Capacity Building

During the project manager consultation, Stantec found that the WFS dose not know enough about the relevant environmental and social requirements, especially the requirements of the safeguard policy of the WB. In the execution of the project, the ability of the project implementation unit and the construction contractor shall be improved to ensure the effective implementation of the ESMP, so it is necessary to strengthen the capacity building of the organization in the process of the pilot project.

The annual training plan to be established in this pilot project is based on the domestic laws and regulations on the environment, OHS and social management, as well as the relevant policy requirements of the FECO and the WB. The main contents of the technical training shall include:

- Environmental protection laws and regulations and social laws, regulations and policies related to the pilot project;
- ESIA procedures;
- Potential environment problems caused by the pilot project;
- ESMP;
- Convention of Stockholm
- Safeguard policy of the WB.

Key training personnel for this pilot project shall include WFS Pilot Project Team, Construction Contractor. In addition, all employees and suppliers of the company shall also be trained. It is shown in **Table 8-5** of the capacity building and training plan of this pilot project.

Table 8-5: Capacity Building and Training Plan

Topic	Target of training	Training content	Number of training person	Training duration (day)
Environmental protection policies, regulations and requirements	WFS, construction contractor, suppliers, etc	<ul style="list-style-type: none"> • Environmental and social related laws and regulations • ESMP • WB's safeguard policy • Convention of Stockholm 	About 15 people	1
ESIA procedures	WFS	<ul style="list-style-type: none"> • WFS ESIA procedures 	8 people	1
Implementation of ESMP	WFS, construction contractor	<ul style="list-style-type: none"> • Environmental and social management requirements during the construction period 	About 5 people	1

Topic	Target of training	Training content	Number of training person	Training duration (day)
		<ul style="list-style-type: none"> • Internal monitoring, external monitoring, and internal audit • Implementation of ESMP 		
Accident handling measures	WFS, construction contractor	<ul style="list-style-type: none"> • Accident emergency plan and measures 	About 13 people	1

9. PUBLIC PARTICIPATION AND INFORMATION DISCLOSURE

9.1 Objectives

The public participation and information disclosure is a two-way communication between the project owner and the public, an important mechanism for the project to reduce its own risks and social impact, and an important way for the project information transparency and for public participation. The main objectives of the public participation and information disclosure are listed as follows:

- To identify stakeholders and build and maintain a constructive relationship with each other.
- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance.
- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them.
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.

9.2 Participation Process and Main Findings

The pilot project's stakeholders, which were identified based on the nature of the pilot project, the information obtained through field investigations and consulting with relevant agencies, consist of project owner (WFS), sister company located within the same campus (Waysmos Fine), government agencies, including the Administrative Committee of Laogang Industrial Park and the Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Pudong New District, Shanghai, project workers, contractors, and the project management office (i.e., FECO).

The stakeholder consultation activities are mainly conducted in August – November 2021 during the environmental and social impacts assessment, which are summarized as follows:

- Consultation with management team of WFS, to understanding the project background, proposed scope of work, potential environmental and social impacts, labor management, etc.

- Consultation with local government agencies, including the Administrative Committee of Laogang Industrial Park, and the Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Pudong New District, Shanghai, to understand current environmental status of the WFS’s facilities, the local regulatory requirements on environmental protection, the frequency of environmental supervision, environmental complaints, land use planning and related policies.
- Consultation with project workers to understand the work conditions, benefits and labor management.
- Site visit to identify potential sensitive receptors.

The main findings identified during the stakeholder’s consultation are summarized in **Table 9-1**. The opinions and suggestions of different stakeholders have been incorporated into this environmental and social management plan.

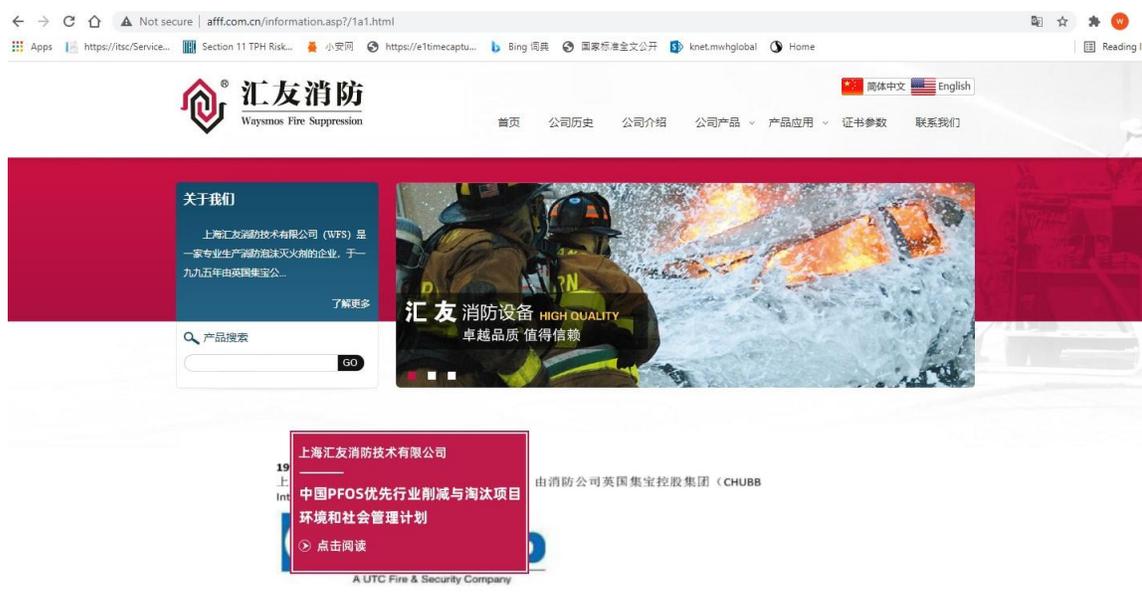
Table 9-1: Summary of Stakeholder Consultation

No.	Stakeholder		Timeframe	Opinions and Suggestions	Proposed Activities
1	Local Government Agencies	Administrative Committee of Laogang Industrial Park	August 2021	<ul style="list-style-type: none"> • Waysmos Fine and WFS are sister companies located within the same campus. They all have a formal management system. No violation on environment occurred during the operation in the past, thus, no penalties or fines were imposed to them. • They all have a good relationship with local government agencies. 	/
2		Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Pudong New District, Shanghai	August 2021	<ul style="list-style-type: none"> • The operation of WFS is in compliance with local environmental requirements. • The local ecology and environment branch conducts irregularly inspection to check the environmental impacts caused by WFS. • There are no environmental complaints from surrounding residence against WFS. • There are no environmental punishments to WFS. 	/
3	Waysmos Fine	General Management Office	August 2021	<ul style="list-style-type: none"> • Both WFS and Waysmos Fine follows the same environmental and social management system. 	/

No.	Stakeholder	Timeframe	Opinions and Suggestions	Proposed Activities
			<ul style="list-style-type: none"> Waysmos Fine provides technical support to WFS during the routine environmental and social management. The general manager of WFS and the head of general management office of Waysmos Fine work together to handle external liaison matters. The employees of WFS are all the members of employee union of Waysmos Fine. They share the same canteen with the employees of Waysmos Fine. 	
4	Project Workers	August 2021	<ul style="list-style-type: none"> All 8 workers have signed formal labor contracts. There is no overtime and continuous work in production workers, according to the reviewed attendance records and salary records. No OHS related complaints were identified during the audit. The contractual relationship between the project workers and WFS has been more than 5 years, and most of the employees have been working in WFS for more than 10 years. The consulted project workers are all satisfied with their job. No discrimination nor harassment has been identified during the audit. WFS has established written procedures for anti-discrimination, anti-harassment, prohibition of child labor, and prohibition of forced labor. WFS has established internal grievance mechanism, but there was no written records of the opinions and suggestions raised by employees, and the related feedbacks. 	It is recommended to assign a designated person to keep the records of the opinions and suggestions raised by employees, and the related feedbacks.

No.	Stakeholder	Timeframe	Opinions and Suggestions	Proposed Activities
5	First-round disclosure of ESMP and feedback collection	November 2021	WFS has performed the first round of disclosure of the ESMP on WFS's official website (www.aff.com.cn) on 2 November 2021, see the webpage screenshot below. There are no feedback collected during the disclosure process.	/

Figure 9-1: First-Round Disclosure of ESMP



9.3 Information Disclosure in Next Stage

The information disclosure in next stage will include:

- Establish a community grievance mechanism, disclose the grievance mechanism to the community, save grievance records, etc.
- WFS will disclose the ESMP upon World Bank's clearance through the company's website and notice boards.

9.4 Community Grievance Mechanism

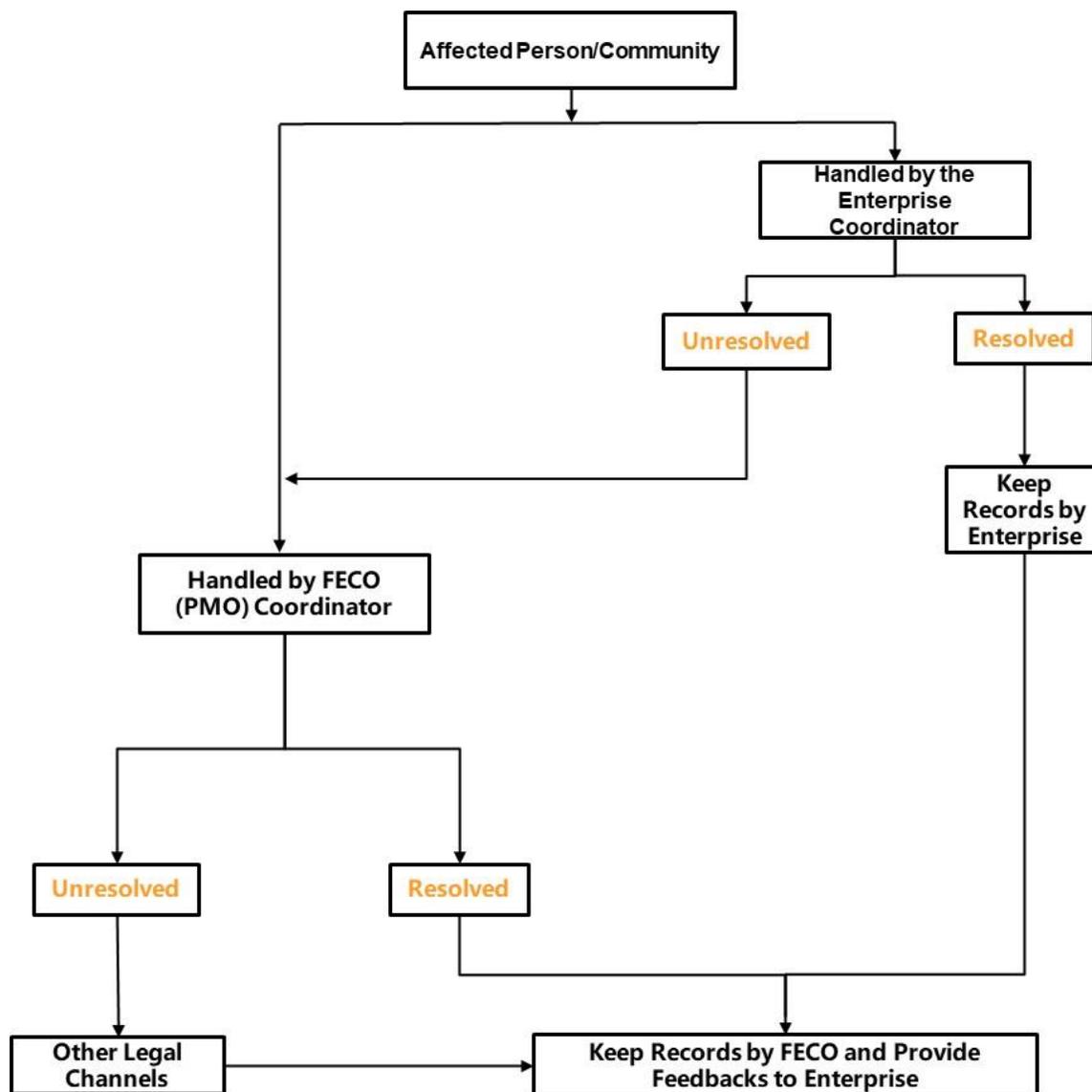
In order to understand and resolve the impacts and problems to the employees of affected enterprises (hereinafter collectively referred to as "affected person") and other stakeholders in a timely manner, meet the information transparency requirements of the affected person, and make the public participation be as widely as possible instead of only the community in vicinity. WFS has established a multi-level grievance mechanism.

At the beginning stage of the pilot project, WFS will assign a designated coordinator (Mr. Fei), who will be responsible for collecting grievances through phone, social media and on-site notice boards, and performing investigation and resolving the pilot project-related complaints.

The coordinator will keep all grievance records in a database. The grievance mechanism consists of the following steps, as shown in **Figure 9-2**

- Step 1: The affected person or community raise the grievance to the coordinator of the pilot project orally or in a written form. WFS needs to keep a written record of oral grievance, and provide clear response to the affected person or community within 2 weeks.
- Step 2: If the affected person or community is dissatisfied with the response of Step 1, they can raise the grievance to the national project management office (i.e., FECO). It shall be noted that the grievance mechanism at the enterprise level (Step 1) and local project management office level (Step 2) are the main channels for resolving the grievances. The national project management office will try its best to work with the local project management office, enterprises, and the affected people/community to solve the problems that cannot be resolved at the local project management office/enterprise level, or there is no project-level grievance mechanism.
- Step 3: If the affected person or community is dissatisfied with the response of Step 2, they can appeal to administrative agencies with jurisdiction level by level for arbitration, according to the Administrative Litigation Law of the People's Republic of China.
- Step 4: If the affected person or community is dissatisfied with the response of Step 3, they can sue in a civil court in accordance with the Civil Procedure Law of the People's Republic of China.

Figure 9-2: Grievance Mechanism



The contact information of the community grievance coordinator is shown as follows:

Coordinator: Mr. Weimin Fei
 Phone Number: 13816416461 / 021 36307198
 Email: tech@aff.com.cn
 Address: No.3 Building, Liangle Road, Laogang Town, Pudong New District, Shanghai

For anonymous grievance, WFS will pay the same attention as other grievances, keep the complainant's information confidential, put forward solutions to the complaints, deal with them and record them within 7 days. FECO will track GRM and keep the records of it.

9.5 Reporting Mechanism

The WFS will prepare the reports on the implementation of the environmental and social management plan, in line with the reporting plan below.

Table 9-2: Reporting Plan

Report Type	Prepared by	Provide to	Frequency
Internal monitoring report	Construction vendor/contractor	Project owner (WFS)	Once (when the construction is completed)
Internal monitoring report	WFS	Project owner (WFS)	Once (during the operation)
External monitoring during construction period	External monitoring vendor	Project owner (WFS), FECO	Twice (once during construction, once when the construction is completed)
External monitoring during formal operation period	External monitoring vendor	Project owner (WFS), FECO	Once (within 3 months after completing the construction)

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Based on the results of the environmental and social audit in Section 5 of this report, as well as the environmental and social impact assessment of the pilot project in Section 8, the following ESMP have been developed for the pilot project (**Table 10-1**).

Table 10-1: Environmental and Social Management Plan

Factor		Management requirement	Responsible by	Supervised by	Cost (RMB)
Alternative products formula research and development stage	Environmental: The cleaning wastewater and the fire extinguishing test wastewater produced during the experiment is basically consistent with the conventional experiment of the existing project.	<ul style="list-style-type: none"> The laboratory wastewater shall be discharged to the wastewater treatment station of Waysmos Fine and the wastewater is discharged to the Nanhui Binhai Wastewater Treatment Plant after the unified treatment. The water quality of the outlet of the wastewater treatment station in the plant shall meet the standards of Table 2 of Comprehensive Sewage Discharge Standard (GB8978-1996). It is required to conduct water quality inspection once during this stage 	WFS	FECO (PMO) , Laogang Industrial Park Management Committee, Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Shanghai Pudong New District	10,000/time
	Occupational Health: Occupational health hazards of staff exposure to chemicals	<ul style="list-style-type: none"> Before starting the research and development test, evaluate the occupational hazard of the proposed new fluorine surfactant, give priority to the chemicals with less human health risk, and take appropriate occupational hazard protection measures (e. g.: PPE, ventilation facilities, etc.) according to the assessment results. Commissioned qualified occupational health technical services to carry out regular testing of occupational disease hazards in the workplace. Train employees on occupational hazard protection to understand occupational disease hazard, protective measures and emergency disposal measures. Provide applicable PPE to staff. Organize the employees to participate in the occupational health checks. 	WFS		50,000
	Safety: Risk of electric shock and mechanical injury during research and development	<ul style="list-style-type: none"> According to the existing safety management system, strengthen the safety training and daily supervision of the staff. Help employees improve the awareness of wearing PPE and provide applicable PPE to employees regularly according to the identified safety risks. 	WFS		/

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Factor		Management requirement	Responsible by	Supervised by	Cost (RMB)
Removal and replacement of equipment stage	Environmental: Equipment cleaning wastewater and domestic wastewater	<ul style="list-style-type: none"> The equipment cleaning wastewater and domestic wastewater shall be collected and discharged into Waysmos Fine wastewater treatment station and treated through the "hydrolysis acidification + contact oxidation" process, then discharged into the municipal pipe network into the Nanhui Binhai Wastewater Treatment Plant, the outlet water quality of the plant wastewater treatment station shall meet the requirements of Class III standards in Table 2 of the Comprehensive Sewage Discharge Standard (GB8978-1996). 	WFS, construction contractor, supplier, waste treatment vendor	FECO (PMO) , Laogang Industrial Park Management Committee, Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Shanghai Pudong New District	/
	Environmental: Cleaning, removal and installation noise	<ul style="list-style-type: none"> The pilot project shall explore more environmentally friendly and less impact approaches for scheme design and technology, especially the construction process that may produce noise. Relevant engineering measures shall be further discussed to reduce the noise impact on construction personnel. Avoid night construction. 			/
	Environmental: Solid waste	<ul style="list-style-type: none"> Domestic garbage shall be collected by the factory and transported and disposed of by Laogang City Appearance and Sanitation Institute The waste equipment can be treated by a qualified solid waste recycling and disposal as the recyclable industrial solid waste or other types of solid waste according to the actual situation. 			/
	Occupational health: Construction workers are exposed to occupational health hazards caused by dust, chemicals, noise, etc.	<ul style="list-style-type: none"> WFS shall sign an environmental health and safety agreement to clarify the obligations and responsibilities of all parties with construction contractor and suppliers. The pilot project shall establish and improve the occupational health protection mechanism, and designate full-time or part-time occupational health administrators to be responsible for the occupational health management in the construction stage. Train the construction personnel on occupational health-related topics regularly, and keep the training records. The pilot project shall help construction personnel strengthen the awareness of wearing PPE, and distribute PPE to the construction personnel of different types of work according to the occupational hazard factors identified. 			/

Waysmos Fire Suppression-Project of Reduction and Phaseout of PFOS in Priority Sectors in China -ESMP

Factor	Management requirement	Responsible by	Supervised by	Cost (RMB)
<p>Safety: Potential safety risk factors such as fire, lifting injury, mechanical injury, electric shock, falling from height and object strike, and vehicle injury during the construction process</p>	<ul style="list-style-type: none"> • WFS shall sign an environmental health and safety agreement to clarify the obligations and responsibilities of all parties with construction contractor and suppliers. • The pilot project shall establish and improve the production safety mechanism. The production department shall conduct production safety related theme training for the construction personnel and keep the training records. • Standardize the operation process of construction personnel, control continuous working hours (e. g. implement rotation working system, arrange rest time and extension time). • Implement a complete site cleaning system, regularly clean up excessive waste and leakage of liquid, civilized construction, reduce dust. • Post warning signs for construction sites with fire, electric shock, high drops and mechanical injuries. • The pilot project shall help construction personnel strengthen the awareness of wearing PPE, and distribute PPE to the construction personnel of different types of work according to the occupational hazard factors identified. • Work permit system shall be implemented for high-risk operations (fire, climbing, hoisting, etc.). • Regular inspection and maintenance of machinery, working vehicles, etc. to ensure that only regulatorily compliant equipment or vehicles (e.g., forklifts and lifting equipment) are used and that the operator has a relevant certificate (e.g., special equipment operator's certificate). • Planning and zoning of vehicle traffic, mechanical operation, walking areas, control of vehicle traffic through one-way traffic rules, setting speed limits, and directing traffic at the scene by trained signalers (wearing eye catching vest or jacket) • Develop emergency plans, organize emergency teams, equip emergency supplies, and conduct training and drills. 			5000
<p>Social: Pollution impact on surrounding communities</p>	<ul style="list-style-type: none"> • Conduct regular monitoring of environmental impact, ensure that noise, exhaust gas and other pollutants meet the standards, and proactively disclose environmental impact monitoring results to the community. • Establish and implement an effective community grievance mechanism, and take the initiative to address complaints from community, respond to complaints from the community, and provide timely feedback to the 			/

Waysmos Fire Suppression-Project of Reduction and Phaseout of PFOS in Priority Sectors in China -ESMP

Factor	Management requirement	Responsible by	Supervised by	Cost (RMB)
Environmental risks and environmental emergency response: Leakage of chemicals or hazardous waste during cleaning equipment	<p>complainants on the results of the processing, properly resolve residents' complaints and maintain appropriate records.</p> <ul style="list-style-type: none"> • Before removal, the residue in the equipment must be cleaned, cleaned without residue before the equipment is removed, and the relevant residues and waste solvents, wastewater shall be properly disposed of. • Ensure that the cleaning site is impermeable, and that all wastewater is collected. • Flames is prohibited during this stage. • Only trained personnel with appropriate PPE can handle and clean the leaked hazardous wastes/hazardous chemicals. Untrained personnel shall keep a safe distance from the leaking site. • The transportation of hazardous wastes/chemicals must be carried out by qualified agency, and the transportation routes shall avoid sensitive points such as water sources. If the leaked hazardous wastes/chemicals are highly toxic and highly volatile, emergency evacuation and rescue measures shall be arranged immediately. Places contaminated by hazardous wastes/chemicals shall be cleaned up in time, and the waste generated in the cleaning process shall be treated as hazardous waste. • If there are injuries, the injured persons shall be treated on-site in a timely manner in accordance with the corresponding chemical first aid methods, and then sent to the hospital for further treatment. 	WFS, construction contractor, waste treatment vendor		/
Trial production and formal operation stage	<p>Environmental management</p> <ul style="list-style-type: none"> • This pilot project should establish a sound environmental protection mechanism and designate a full-time or part-time environmental administrator to be responsible for WFS environmental management. Regularly train all employees on environmental-related topics and keep a record of the training. • As for the discharge outlet of wastewater treatment station in plant, the pollutant factors not monitored online shall be inspected regular by qualified third-party testing institutions for regular testing, water quality shall meet the "Comprehensive Sewage Discharge Standard" (GB8978-1996) Table 2 in the three-level standard requirements. • The factory noise of this pilot project shall be regularly tested by a qualified third-party inspection agency, and the noise results shall meet the requirements of the 	WFS	FECO (PMO) , Laogang Industrial Park Management Committee, Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Shanghai Pudong New District	/ 10,000/time 10,000/time

Waysmos Fire Suppression-Project of Reduction and Phaseout of PFOS in Priority Sectors in China -ESMP

Factor	Management requirement	Responsible by	Supervised by	Cost (RMB)
	<p>Category 3 of “Environmental Noise Emission Standards of Industrial Enterprises” (GB12348-2008).</p> <ul style="list-style-type: none"> Solid waste generated by this pilot project consists of waste bucket, waste bags, household waste and hazardous waste. General solid waste should be collected and dealt with by qualified third-party organizations. Hazardous waste shall be transported and treated by third-party organizations with hazardous waste disposal qualification. 			
Occupational health : Occupational hazards of staff exposure to chemicals	<ul style="list-style-type: none"> Commissioned qualified occupational health technical services to carry out regular testing of occupational disease hazards in the workplace. Train employees on occupational hazard protection to understand occupational disease hazard, protective measures and emergency disposal measures. Complete occupational disease declaration This pilot project shall entrust qualified institutions to provide regular occupational health checks to employees exposed to occupational disease hazards. Provide employees with applicable PPE. 	WFS	FECO (PMO) , Laogang Industrial Park Management Committee	10,000/time / 10,000/time
Safety: Mechanical injury, electric shock, falling from high place, fire and other safety risk factors during the production process.	<ul style="list-style-type: none"> Further improve the safety production management system, regularly train all staff on safety production related topics. Update the emergency plan for safety production accidents and complete the filing. And organize regular training and drills. 	WFS	FECO (PMO) , Laogang Industrial Park Management Committee	/ 50,000
Labor management	<ul style="list-style-type: none"> This pilot project shall further improve the grievance handling mechanism of the project staff. Address and document employee opinions, feedback, and concerns. 	WFS	FECO (PMO) , Pudong New District Human Resources and Social Security Bureau	/
Social management	<ul style="list-style-type: none"> This pilot project shall establish a social management mechanism and designate a full-time or part-time 	WFS	FECO (PMO) , Pudong New	/ / /

Waysmos Fire Suppression-Project of Reduction and Phaseout of PFOS in Priority Sectors in China -ESMP

Factor	Management requirement	Responsible by	Supervised by	Cost (RMB)
	<p>community liaison officer to be responsible for community communication management of WFS.</p> <ul style="list-style-type: none"> The pilot project shall establish and implement an effective community grievance processing mechanism and take the initiative to disclose the project grievance mechanism to the community, to deal with complaints from the community, and to timely feedback the results of the processing, properly resolve the residents' complaints The pilot project plans to conduct two round publicities of ESMP in October and November 2021, in the company's website, the plant public notice board. Conduct regular monitoring of environmental impact, ensure that noise, exhaust gas and other pollutants meet the standards, and proactively disclose environmental impact monitoring results to the community. 		District Human Resources and Social Security Bureau	See environmental management row
Emergency response: Chemical leakage during the trial production and formal operation stage, and improper operation will result in poisoning and injury.	<ul style="list-style-type: none"> Only trained personnel with appropriate PPE can handle and clean the leaked hazardous wastes/hazardous chemicals. Untrained personnel shall keep a safe distance from the leaking site. The transportation of hazardous wastes/chemicals must be carried out by qualified agency, and the transportation routes shall avoid sensitive points such as water sources. If the leaked hazardous wastes/chemicals are highly toxic and highly volatile, emergency evacuation and rescue measures shall be arranged immediately. Places contaminated by hazardous wastes/chemicals shall be cleaned up in time, and the waste generated in the cleaning process shall be treated as hazardous waste. If there are injuries, the injured persons shall be treated on-site in a timely manner in accordance with the corresponding chemical first aid methods, and then sent to the hospital for further treatment. 	WFS, construction contractor, waste treatment vendor		/

11. COST ESTIMATION

The implementation cost of the environmental and social management plan includes wastewater treatment costs, equipment updating and commissioning costs, training costs, costs of preparing risk assessment and related environmental and social management plan monitoring. Tasks 5, 6, and 7 do not involve the expenses of environmental and social management plan. The detailed cost estimate is shown in **Table 11-1**.

Table 11-1: Budget table for this pilot project

Task	Subject	Cost (10,000 RMB)
Task 1	Environmental protection treatment fee for lab wastewater	30.00
Task 2	Wastewater treatment fee	39.00
Task 3	PFOS/PFOA testing equipment fee	120.00
	Updating of other equipment	25.50
	Testing equipment usage fee	12.50
	Testing equipment debugging and calibration costs	89.20
	Wastewater treatment fee	15.00
Task 4	Staff training fee	10.00
Task 8	Environmental and social monitoring report preparation	15.00
	Environmental and social management plan preparation	8.5
	Environmental and social management plan implementation cost (includes GRM implementation cost)	14.50
Total		379.20

12. APPENDICES

Appendix A: List of Consulted Stakeholders

Stantec performed consultation with stakeholders on August 17, 2021, as part of the environmental and social impacts assessment. The consulted stakeholders were listed as follows. Their co-operations are highly appreciated.

No.	Name	Department	Title
1	Mr. Fei	WFS	Manager of Technology Department
2	Mr. Ye	WFS	General Manager
3	Ms. Mao	WFS	Manager of Administration Department
4	Mr. Zhang	Waysmos Fine	Head of the General Management Office
5	Mr. Ding	Administrative Committee of Laogang Industrial Park	Staff of Environment Department
6	Mr. Diao	Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Pudong New District, Shanghai	Branch Leader

Appendix B: Real Estate Certificate

沪 (2017) 浦字 不动产权第 048692 号		附 记																																																																									
权利人	上海汇友精密化学品有限公司	房屋坐落	老港镇良乐路388号	房屋用途	工业厂房	房屋层数	6	房屋面积	7931.57	房屋分摊面积	7931.57	房屋用途	工业厂房	房屋层数	1	房屋面积	1523.24	房屋分摊面积	1523.24	房屋用途	工业厂房	房屋层数	1	房屋面积	2331.61	房屋分摊面积	2331.61	房屋用途	工业厂房	房屋层数	1	房屋面积	2331.61	房屋分摊面积	2331.61	房屋用途	工业厂房	房屋层数	1	房屋面积	2372.88	房屋分摊面积	2372.88	房屋用途	工业厂房	房屋层数	1	房屋面积	880.21	房屋分摊面积	880.21	房屋用途	工业厂房	房屋层数	1	房屋面积	1572.97	房屋分摊面积	1572.97	房屋用途	工业厂房	房屋层数	1	房屋面积	122.54	房屋分摊面积	122.54	房屋用途	工业厂房	房屋层数	1	房屋面积	301.62	房屋分摊面积	301.62
共有情况	单独所有	不动产权单元号	详见附记	权利类型	国有建设用地使用权/房屋所有权	权利性质	土地权利性质：出让	用途	土地用途：工业/房屋用途；详见附记	面积	宗地面积：35728.00平方米/ 建筑面积：22547.31平方米	使用期限	国有建设用地使用权使用期限：2006年11月30日起2056年11月29日止	权利其他状况	土地状况： 地号：南汇区老港镇17街坊6/3丘； 使用权面积：25728.00平方米。 房屋状况：详见附记。																																																												

Appendix C: Lease Agreement of the Site

<p style="text-align: center;">厂房出租合同书</p> <p>甲方（出租方）：上海汇友精密化学品有限公司</p> <p>注册地址：上海市浦东新区良乐路 388 号 邮编：</p> <p>【法定代表人】： 王以丹 联系电话：</p> <p>【营业执照】号码：3140000116463(浦东)</p> <p>乙方（承租方）：上海汇友消防技术有限公司</p> <p>注册地址：上海市浦东新区老港镇良乐路 388 号 3 楼 邮编：201302</p> <p>【法定代表人】： 王以丹 联系电话： 021-36307198</p> <p>【营业执照】号码：91310113607329734</p> <p>根据有关法律法规，甲乙双方在平等、公平与合理的原则下经友好协商一致达成如下条款，以供遵守。</p> <p>第一条 承租物业位置、面积、用途及设施配套</p> <p>1.1 甲方将位于上海市浦东新区良乐路 388 号 的厂房（以下简称承租物）的一部分物业即厂房 B、C、D 幢出租给乙方，合计建筑面积 厂房 6994.83 平方米。乙方有权聘请具有合格资质的相关测量机构进行复核；如有差异，则应在双方认可后对本合同中的面积与相关费用数据进行必要调整。</p>	<p>1.2 本出租物业的主要功能为工业用厂房，出租给乙方使用。甲方确保将协助乙方向上海市老港工业园区管理委员会及相关政府部门确认乙方在筹备入驻和正式投产前能顺利获得生产经营所需各项政府审核批准，包括但不限于规划、环保、消防、工商登记和税务登记等。如乙方需转变使用功能，须经甲方书面同意，因转变功能所需办理的全部手续由乙方按政府的有关规定申报，因改变使用功能所应交纳的全部费用由乙方自行承担。</p> <p>1.3 设施配套：在上海市浦东新区良乐路 388 号的供电总量（1000KVA）中，甲方将提供 100 KVA 给乙方专门使用，并将为乙方安装独立的计量表。同时，甲方保证为乙方提供稳定的供水、天然气和通讯线路，具体供应标准见附件十一。</p> <p>(注：租赁期内水、电费的计算方法按表计费加损耗分摊，单价按公用事业单位设定)</p> <p>第二条 租赁期限</p> <p>2.1 双方约定租赁期为 10 年 0 月 0 天，即从 2019 年 5 月 1 日起至 2029 年 4 月 30 日止。倘甲方提前终止该厂房的租赁合同，甲方与乙方的转租租约应同时终止，甲方应按月租金的 6 倍向乙方支付违约金。</p> <p>2.2 租赁的续签在期限届满前 6 个月提出，经甲方同意后，甲乙双方将对有关租赁事项重新签订租赁合同。在同等承租条件下，乙方有优先权。</p> <p>第三条 出租物业的交付</p> <p>3.1 在本出租合同生效之日起，甲方将出租物业按现状交付给乙方使用，且乙方同意按出租物业及设施的现状承租。</p>
<p>第四条 租赁费用</p> <p>4.1 本合同的租金标准为厂房 0.6 元/平方米/天，即每月租金为人民币 127622 元整【计算公式如下：（0.60 元/平方米 X 6994.83 平方米 X 365 天 ÷ 12 月】。另外续约租金可根据同区域同类型厂房的市场均价进行调整磋商，每次调整的幅度上下不超过 10%；场地道路为免租金（乙方可在邻近其租赁的厂房的室外区域放置设备或货物）。</p> <p>4.3 甲乙双方同意由甲方全面负责物业管理，包括厂区保安、绿化、公共区域的清洁、厂房设施与设备的维修、保养，乙方为此将依照 2,000.00 元/月的标准向甲方支付物业管理费，其它如垃圾清运与依照政府相关法规需交纳的费用由双方另行友好协商约定。</p> <p>第五条 租赁费用的支付</p> <p>5.1 付款方式：乙方自起租日（2017 年 5 月 1 日）起每三个月经保证方向甲方支付一次房租，先付后用。</p> <p>5.2 甲方将在自起租日（2017 年 5 月 1 日）起每三个月的首 5 天经保证方向乙方发出付款通知书，乙方应于收到该通知书的 15 日内经保证方向甲方以公司支票的方式支付当期租金，收款后甲方应在 3 个工作日内出具有效发票。乙方有义务确保及时交付租金；每逾期一天，则其应按等同于月租金的 0.5% 的标准缴纳滞纳金。</p>	<p>第六条 物业的管理</p> <p>6.1 在租赁期限内，甲方全面负责物业管理，及时修理和维护物业并承担相关费用。乙方应爱护并合理使用其所承租的该房屋及其附属设施。如因乙方使用不当造成厂房或设施损坏，乙方应及时负责修复或委托甲方修复，同时乙方应承担相关的合理费用。</p> <p>6.2 在接受物业后，为满足其生产运营要求，乙方计划对其承租的部分进行的主要装修与改建将包括：</p> <p>1) 厂房区域</p> <ul style="list-style-type: none"> - 增建承载水缸基础，约 200 平方米 - 增加供水及排水沟渠及管道 <p>2) 管理区域</p> <ul style="list-style-type: none"> - 增建小型泡沫实验室及办公用房 - 增建装饰吊钩及照明系统 - 增建男/女卫生间 - 增建办公室供电及供水系统 <p>乙方需提前向甲方提交装修、改建设计的具体方案，并经甲方与业主讨论出具书面认可，同时须按相关规定向政府有关部门申请并获得批准后方可动工。乙方自行负责装修和改建部分的修理和维护。</p> <p>如装修、改建方案可能对公用部分及其它相邻用户影响的，甲方对该部分方案提出异议，乙方应予以修改。改建、装修费用由乙方承担。</p> <p>6.3 与乙方有关的环评、卫生、消防等事宜由乙方在甲方与工业园区管理委员会的协助下向相关政府部门进行办理。</p>

第七条 提前终止合同

7.1 在租赁期限内，若遇乙方欠交租金超过 30 日，甲方在书面通知乙方交纳欠款之日起五日内，乙方未支付有关款项，甲方有权停止乙方使用出租物业内的有关设施，由此造成的一切损失由乙方全部承担。同时，甲方有权提前解除本合同。在甲方以传真或信函等书面方式通知乙方及保证方之日起，本合同自动终止。甲方有权留置乙方承租物业内的财产（包括承租人的财产）并在解除合同的书面通知发出之日起五日后，方将申请拍卖留置的财产用于抵偿乙方应支付的因租赁行为所产生的全部费用。

7.2 非本合同规定的情况，甲乙双方在租赁期间擅自解除本合同，应提前一年书面通知对方，同时应按月租金的 6 倍向对方支付违约金。

第八条 保险

本合同租赁期内，乙方将仅负责其自身资产、设备与员工的相关保险。物业的保险由业主负责。

5

第九条 陈述和保证

9.1 甲乙双方在此各自作出如下陈述、保证和承诺：

1) 该方为一家依据适用法律合法设立并有效存续的法人，拥有签署、递交并履行本合同的能力和权利，以及独立承担本合同项下的法律义务的能力；

2) 该方为签署、递交并履行本合同而采取的每一项行为均未违反任何法律、其章程、其为一方订立的任何协议及合同，以及任何其他它具有类似性质的文件，以及

3) 其已取得了使其能够签署并履行本合同所必需的、所有第三方的同意和批准；

9.2 甲方在此向乙方作出如下陈述和保证：

1) 上海汇友精密化学品有限公司是本合同出租物业的唯一合法所有者；

2) 与出租物业相关的土地使用权已经合法且适当地转移给了上海汇友精密化学品有限公司；

3) 在本合同签署之前，出租物业上不存在任何抵押和其他任何限制或担保权益，并且在本合同签署之日后，未事前获得承租人的书面同意，出租人不得设定该等抵押、限制或担保权益；

4) 在本合同期限内，不存在将会妨碍承租人营业或违反任何中国环境保护法律的环境污染；

5) 如上海汇友精密化学品有限公司转让土地使用权，甲方成为新业主，或者甲方与新业主继续履行原厂房租赁合同时，甲方不得以此为理由不履行本合同任何条款。

6

第十条 免责条款

10.1 若因政府有关租赁行为的法律法规的修改导致甲方无法继续履行本合同时，将按本条第2款执行。

10.2 凡因发生严重自然灾害、战争或其他不能预见的、其发生和后果不能防止或避免的不可抗力致使任何一方不能履行本合同时，遇有上述不可抗力的一方，应立即用邮递或传真通知对方，并应在三十日内，提供不可抗力的详情及合同不能履行，或部分不能履行，或需延期履行理由的证明文件。该项证明文件应由不可抗力发生地区的公证机关出具，如无法获得公证出具的证明文件，则提供其他有力证明。遭受不可抗力的一方由此而免责。

第十一条 合同的终止

本合同提前终止或有效期届满，甲、乙双方未达成续租协议的，乙方应于终止之日或租赁期限届满之日迁离承租物业，并将其返还甲方。如乙方确有困难，甲方同意给予乙方两周的宽限期；如乙方过此宽限期未经甲方同意仍未迁离，则需向甲方按当期租金标准的双倍交付租金。

第十二条 不可抗力

12.1 不可抗力事件指不能预见并且不能避免和克服的事件，包括但不限于自然灾害(如地震、洪水或火灾)、罢工或暴动。

12.2 如果发生任何不可抗力事件，因遭受不可抗力事件而不能履行其在本合同项下的义务的一方应毫不延迟地通知另一方，并且在不可抗力事件发生后十五(15)日内提供证明该事件详细情况的资料和公证文件，并且应采取适当的方式减少或消除不可抗力对另一方的负面影响。

12.3 双方应根据不可抗力事件对履行本合同的影响来决定是否延迟本合同的履行或终止本合同。

第十三条 适用法律

12.1 本合同在履行中发生争议，应由双方协商解决，若协商不成，则通过仲裁程序解决，双方一致同意以中国国际经济贸易仲裁委员会上海分会作为争议的仲裁机构。

12.2 本合同受中华人民共和国法律的管辖，并按中华人民共和国法律解释。

第十四条 其它条款

14.1 租赁物的土地使用费由甲方支付。

14.2 本合同未尽事宜，经双方协商一致后，可另行签订补充协议。

14.3 本合同一式贰份，甲、乙双方各执壹份。

第十五条 合同效力

本合同经双方签字盖章，并收到乙方支付的租赁保证金款项后生效。

甲方（印章）：上海汇友消防设备有限公司

授权代表（签字）：_____

乙方（印章）：上海汇友消防设备有限公司

授权代表（签字）：_____

2019年4月20日

Appendix D: List of Reviewed Document

No.	Document
1	Investment project record certificate, issued by the Development and Reform Commission of Pudong New District, Shanghai, on May 31, 2017.
2	Lease agreement of the site, dated April 20, 2019
3	Environmental impacts assessment form, and the related approvals issued by the Environmental Protection and City Appearance Administrative Bureau of Pudong New District, Shanghai, on July 5, 2018.
4	Pollution discharge registration form, valid until August 6, 2025.
5	Environmental completion acceptance form and registration record in November 2018.
6	Wastewater and noise level monitoring reports in 2019 and 2020.
7	Approval form for pollutant discharge amount control, issued by the People's Government of Laogang Town, Pudong New District, and the Environmental Protection and City Appearance Administrative Bureau of Pudong New District, Shanghai, in 2017
8	The Certificate of No Major Environmental Violation, issued by the Ecology and Environment Branch of Urban Management and Law Enforcement Authorities of Pudong New District, Shanghai, on April 2, 2021.
9	Health, safety and environment procedures.
10	Organization chart of management system
11	Two copies of labor contracts, two copies of human resource documents, and two copies of social insurance records.
12	List of employees.
13	Attendance records of production workers in June and July 2021.
14	Salary records of production workers in June and July 2021.
15	Training plan in 2021.
16	Testing reports of chemicals.
17	Management procedures of wastewater treatment facility.
18	Hazardous waste disposal contracts, valid until May 31, 2022
19	Hazardous waste management plan, valid from January 1, 2021 to December 31, 2021.
20	Hazardous waste transportation manifests in 2019 and 2020.
21	Pre-assessment report of occupational disease hazards, dated February 2018.
22	One copy of notification of occupational disease hazards.
23	Training certificate for safety management personnel, dated September 2017.
24	Safety facility completion acceptance inspection report dated June 2020.
25	Emergency plan for safety accidents, dated May 28, 2020.
26	Investigation report of emergency resources for safety accidents, dated January 2020.
27	Risk assessment report of emergency resources for safety accidents, dated January 2020.
28	Fire protection facility completion acceptance approval in 2015.
29	Testing report for lightning-proof facilities, dated September 2020.
30	Routine inspection records for firefighting facilities.
31	Inspection report of forklift, dated September 2020.
32	Three copies of the certificate of special equipment operators (forklift driver), valid until June 2023.

No.	Document
33	Routine check records for forklift.
34	Routine inspection and maintenance records of production equipment.
35	Real estate certificate, dated April 28, 2017.
36	Employee handbook, October 2016 edition.

Appendix E: Site Photo Log



Photo 1: Entrance of the campus of Waysmos Fine.



Photo 2: Entrance of WFS (No.3 building)



Photo 3: Raw material storage area.



Photo 4: Production area.



Photo 5: Products storage area.



Photo 6: Chemical cabinets.



Photo 7: Laboratory.



Photo 8: Testing area.



Photo 9: Wastewater treatment facility (shared with Waysmos Fine).



Photo 10: Hazardous waste warehouse (shared with Waysmos Fine).



Photo 11: Consultation with Waysmos Fine.



Photo 12: Consultation with Laogang Industrial Park.



Photo 13: Northern boundary of the No.3 building.



Photo 14: Eastern boundary of the No.3 building.



Photo 15: Southern boundary of the No.3 building.



Photo 16: Western boundary of the No.3 building.