E-296
VOL. 3

MATERIALS FOR ENVIRONMENTAL ASSESSMENT OF THE OZONE DEPLETING SUBSTANCE PRODUCTION CLOSURE PLAN (CFC 11, CFC 12, CFC 113) AT THE OJSC "KHIMPROM"

Volgograd, 1999

Environmental assessment (EA) of the Ozone Depleting Substance (ODS) Production Closure Plan has been made basing on the information supplied by experts of the OJSC "Khimprom" (Volgograd) and the international consulting firm Arthur D. Little Inc. (USA) during the pre-appraisal mission of the World Bank and CPPI from July 4 to July 14, 1999 (Attachment 1) within the framework of the Special initiative on ODS production shut down in the Russian Federation.

According to the Resolution of the Government of the Russian Federation "On prime measures on fulfillment of the Viennese Convention on ozone layer protection and Montreal Protocol" dated May 24, 1995, and under the London Addendum to the Montreal Protocol on ozone layer polluting substances, OJSC "Khimprom" begins realization of the ODS Production Closure Plan (CFC-11, CFC-12 and CFC 113).

The objectives of environmental assessment of the ODS Production Closure Plan during meetings and negotiations with the experts of OJSC "Khimprom" (Attachment 2) were:

- revealing of sources of ODS production impact on the environment and evaluation of their "input" in forming the environmental situation at the plant and in the city;
- confirmation of availability of technical possibilities on ODS production closure and elimination of related environmental impacts;
- evaluation of completeness of revealed environmental and related social consequences of the Closure Plan implementation;
- evaluation of completeness and sufficiency of measures provided for environmental quality management at the Closure Plan implementation;
- development of the Environmental Management Plan at implementation of the Closure Plan;

The Order of Goscomecology No 306 dated June 07, 1999 assigned the monitoring of ODS production closure at OJSC "Khimprom" to the *Volgograd* Oblast State Committee on Environmental Protection.

TABLE OF CONTENTS

Attachment 11	Scheme of of air quality control points in the residential zone of OJSC «Khimprom»
Attachment 12	Schedule of monitoring of gas cleaning installations
Attachment 13	Calculation of 10-percentage allocations from payments for actual pollution of natural environment for a quarter, directed to the federal budget to Russian Federation in 1998
Attachment 14	Summary data on optimal regime of waste incineration and quality of generated wastewater and gas emissions
Attachment 15	Letter of the State Committee on Environmental Protection of the city of Volgograd about the coordination of incineration of organic waste at OJSC «Khimprom»
Attachment 16	Minutes of public consultations at OJSC «Khimprom» on July 14, 1999
Attachment 17	Environmental management plan for the ODS Production Closure Plan implementation at OJSC «Khimprom»
Attachment 18	Plan of verification of fulfillment of measures on closing ODS production at OJSC «Khimprom»

1. GENERAL CHARACTERISTIC OF THE ENTERPRISE

History of creation. OJSC "Khimprom" (Kirov district of Volgograd) was constructed in 1931 for production of Kaustic, chlorine and chlorinated compounds. In 1959, production of CFC 11 and CFC 12 was begun, in 1969 – production of CFC 113.

Major activities. The Enterprise is one of the largest manufacturers of CFC 11, CFC 12 and CFC 113 in Russia. Historically and currently the total production of CFC 11 and CFC 12 made up to 30-50 % of total annual production in the country. Earlier ODS made an important part of OJSC "Khimprom" production both by consumption of chlorine and by maintenance of production of household and industrial aerosols. With a fall in demand and introduction of stiff limitations by quotas, ODS have ceased to be one of the main products of the Enterprise.

II. DESCRIPTION OF ODS PRODUCTION AT OJSC "KHIMPROM"

Production of CFC 11 and CFC 12

The process of CFC 11 and CFC 12 production at OJSC "Khimprom" is based on fluorination of carbon tetrachloride (CTC) by fluorine hydride (HF) in the fluid phase on the antimony pentacloride catalyst, which is received at the Enterprise by chlorination of metal antimony. At this, hydrochloric acid with concentration 31 % is received as by-product. The process of production consists of 9 main phases:

- production and feeding of carbon tetrachloride (CTC)
- reception and feeding of fluorine hydride (HF)
- synthesis of CFC 11 and CFC 12;
- separation of hydrochloric acid and neutralization of crude light-end product;
- separation of hydrochloric acid and its inhibition;
- purification of crude CFC 11/12 mixture;
- compression and drying of CFC 11/12 mixture;
- separation of CFC 11/12 in pure components; and
- storage, filling and shipment of finished products.

CTC is fed from shop 7 by a special pipeline in two service tanks at Shop 306 where CFC-11 and CFC-12 is produced. The fluorine hydride, purchased by the Enterprise, is stored in shop 1481 and also fed into two service tanks Shop 306. There are 4 (two stage) synthesis reactors, of which only three are in operation. This allows the Enterprise to make 12,000 tons of CFC 11 and CFC 12 per year. Now the OJSC "Khimprom" reorganizes the CFC 11/12 production lines for production of HCFC 22.

Production of CFC 113

The process of CFC 113 production is based on direct liquid-phase transformation of perchlorethylene under the action of fluorine hydride at the presence of chlorine. The catalyst is antimony pentachloride. All process consists of the following phases:

- reception, storage and feeding of perchlorethylene;
- reception, storage and feeding of fluorine hydride;
- reception, storage and feeding of chlorine;
- synthesis of CFC 113:
- purification of off-gases of synthesis;

- separation and inhibition of hydrochloric acid;
- topping of light distillates from crude CFC 113;
- cleaning of CFC 113; and
- storage, filling and shipment of finished product.

Perchlorethylene is delivered by rail cars and pumped into two storage tanks placed in shop 1479. Chlorine is fed by a pipeline from the place of its production at the Enterprise. Hydrogen chloride is supplied through a special pipeline from the warehouse to storage tanks inside shop 1479.

III. EVALUATION OF THE OJSC "KHIMPROM" ROLE IN ENVIRONMENTAL POLLUTION OF VOLGOGRAD

The city of Volgograd is one of major industrial centers of the Russian Federation with well developed black metallurgy, machine industry, chemical, petrochemical and aluminum industries, as well as production of building materials. Negative environmental consequences of industrial development of the city and specific town-planning decisions are manifested in three main forms of degradation of the environment: pollution of air, water bodies, first of all the Volga River, and soil with gaseous, liquid and solid waste from industrial production; depleting of natural resources; almost complete elimination of natural ecosystems and landscapes.

Condition of the environment in the area of the Enterprise. OJSC "Khimprom" is located in the Kirov district of Volgograd, extending along the Volga River for 3 km. The sanitary-protective zone of the Enterprise makes 1000 m with allowance for prospects of the Enterprise's development and actual pollution of free air (Attachment 3). Some major enterprises are located directly in the city: heat-and-power plant, ferro-concrete articles factory, etc. The residential blocks are located 1.5 km to the south and southeast from the Enterprise. The Sarpinsk recreation facility is located 3 km to the north.

Air pollution. The emissions of pollutants from the main production of OJSC "Khimprom" in 1998 have made:

(1) 68.39 t - solid;
(2) 4,589.73 t - liquid and gaseous, out of them:

Table 1

AIR EMISSIONS OF POLLUTANTS FROM OJSC «KIMPROM» FOR 1998.

##	Pollutant	MAE, ton/year	Actual emission, ton/year
1	Sulphurous anhydride	90.500	41.600
2.	Carbon oxide	4,131.365	2,056.198
3	Nitric oxides	400.500	192.0630
4	Nitrogen oxide	6.005	3.791
5	Hydrogen chloride	205.668	78.076
6	Sulfurated hydrogen	0.181	0.008
7	Chlorine	27.218	10.008
8	Trichlorethane (Penolene 643)	1.708	1.704
9	Hydrogen fluorine	2.500	0.627

. The area of air pollution zone distribution is up to the boundary of sanitary protective zone.

The Enterprise emits pollutants into the air according to the Permit issued by the State Committee on Environmental Protection of the Volgograd oblast (Attachment 4).

Pollution of water basin. Each production at OJSC "Khimprom" is supplied with local treatment facilities. The final phase of wastewater treatment at the Enterprise is neutralization in the neutralization shop. Household sewage of the Enterprise mixes up with neutralized wastewater and is transmitted to biological treatment facility of OJSC "Kaustic", that is why the Enterprise has no authorized MAD. Total of wastewater makes up to 8,000 m^3/day, its composition corresponds to the Technical Specifications of the biological treatment facility No 7-40/87, developed and approved by the Chief Engineer of OJSC «Kaustic» in 1998.

The monitoring of wastewater quality and observance of the rules is also realized by Experimental Environmental Laboratory of the biological treatment facility of OJSC «Kaustic» working in an around the clock mode. The laboratory has the Certificate of Accreditation. The studies of effluent quality after the biological treatment facility in different points of sampling have shown high performance of operation of these treatment facilities (Table 2)

Table 2

DATA ON THE RESULTS OF COMPARATIVE ANALYSIS OF WASTE WATER SAMPLS AFTER BIOLOGICAL TREATMENT FACILITIES AND SAMPLS FROM THE RIVER VOLGA FOR MAY 1998

№ №	Pollutants	The specification of wastewater quality arriving to bed 1 from OJSC «Khimprom», mg/l	Sample from bed 1, mg /l	Sample after 2 settlers, mg / l	Sample from the river Volga, mg /l
	pH	6.5 - 10.0	8.74	6.72	7.78
	Suspended matter	1,000.0	28,0	15,2	2.4
	COD	3,200	39.2	26.8	7.3
	Ammonia nitrogen	140.0	0,61	0,92	0,16
	Nitrogen of nitrates	115	0,085	0,03	0,027
	Sulfates	2430	310,4	203,5	97,2
	Chlorides	2860.0	953,6	896,9	33,8
	Iron 3 valent	8.0	0,35	0,03	0,25
	Mercury	0.005	н/о	0,0003	-
	Synthetic surfactants	110.0	0,074	0,12	0,033
	Sulfides	1.5			
	Phenols	3.3	н/о	0,005	-
	Petroleum	15.0	н/о	1,37	-
	Fluorides	12.5	0,4	0,30	0,21

Such suspended matter as trichlorethylene, CTC, 1.1.2-trichlorethylene were not detected in any point of sampling.

Industrial waste geenration. A fair quantity of industrial wastes of classes III and IV of danger is annually formed at OJSC "Khimprom". In 1998, according to a Polling Leaf on Industrial Wastes of Production and Consumption (Attachment 5), 1200 t of industrial waste were generated at the Enterprise, out of them:

- waste of class IV of danger - 9340 tons;
- waste of class II of danger - 266 tons;

Both kinds of waste are transported by trucks to section 2 of the poligon-accumulators of OJSC «Kaustic», where they are disposed..

The section 2 of the poligon-accumulator of OJSC «KCaustic» was constructed on the territory of former landfill of OJSC «Khimprom» (since 1967 to 1996) in 1997. After banning its operation in 1996, because of uncontrollable disposal of industrial wastes and decision of the Administration of Volgograd obl soda ast on its liquidation with a consequent filling, its territory was transferred to OJSC «Kaustic », which, at financial support of OJSC «Khimprom», has prepared the civil-engineering design of section 2 and has realized the first stage of operations on construction of beds 1 and 2, where now arrive solid, liquid, and paste-like waste from these enterprises. The design capacity is 4,600.0 ton/year of waste, including 600 ton/year of solid waste and 4000 ton/year of liquid waste. Ponds-accumulators are formed by a system of protection dams up to 6 m high of local sandy clays. For prevention of filtration from ponds, a compacted core is made in the dam body and a spur of «chocolate» clay, which is considered waterproof.

Liquid and paste-like waste of classes III and IV of danger arrive through a special trough under the layer of waste water filling «dirty» section of the pond-accumulator. Solid waste is unloaded by trucks at northern edge of the pond-accumulator, compacted and covered by soil.

At inspection of underground water outside the dams of section 2 of pond-accumulator of OJSC «Kaustic » no filtration was revealed. The probability of pollution due to infiltration through ponds is rather small. (Attachment 6)

The disposal of waste is carried out according to the Permit issued by the State Committee on Environmental Protection of Volgograd oblast. The Permit No 43/0 dated March 19 1999 includes the list and the amount of waste allowed for disposal in 1999 (Attachment 7). The Permit was issued on the basis of the Sanitary Passport of the enterprise agreed with the Goscomecology of Volgograd of January 19, 1999.

All activities of OJSC "Khimprom" related to utilization, storage, transportation and disposal of industrial wastes (solid and liquid) are carried out on the basis of the License, registration number 59M/98/420/001/L dated February 11, 1998 (Attachment 8).

Nature protection activity of the Enterprise. The nature protection policy of OJSC "Khimprom" is directed on gradual elimination of all kinds of technogenous environmental impact. Annually, the Enterprise develops the Plan of Environmental Protection Measures, which is coordinated in the State Committee on Environmental Protection of the Volgograd oblast. The shut down of ODS production and liquidation of waste of this production (gas

emissions, acid wastewater) is one of directions of nature protection policy. Thus, the introduction of the scheme of utilization of gas surplus (chlorine, fluorine hydride, hydrogen chloride) for ODS production is included in the Plan of Environmental Protection Measures for 1999 (Attachment 8).

The measures included in the given Plan are financed both by the Enterprise and by the Environmental Fund. Operating at OJSC "Khimprom" Department of Nature Protection and Rational Use of Natural Resources and Sanitary Laboratory realize monitoring of the environmental impact of the Enterprise as agreed with inspection of Goscomecology of Volgograd oblast. With this purpose are developed jointly:

- programs of air analyses on the territory of the Enterprise (Attachment 10);
- schedule of air quality monitoring (Attachment 11); and
- schedule of scrubber (Attachment 12).

The nature protection services of OJSC "Khimprom" have a special license for development of the MAE (MAD) specifications (Attachment 13).

Nature protection payments. In 1998. OJSC «Khimprom» has paid for actual environmental pollution 62,612,000 Rbl, including:

- air emissions from stationary sources - 48,408,000 Rbl.
- air emissions from mobile sources – 824,000 Rbl.
- disposal of waste within the established limits – 13,979,000 Rbl.
- .

The calculation of payments is made by the Accounts Department of OJSC «Khimprom» and is coordinated with the Goscomecology of Volgograd (Attachment 14).
Note: A Statement indicating payments are current would be useful.

IV. ENVIRONMENTAL IMPACT OF ODS PRODUCTION AT OJSC "KHIMPROM"

Sources of environmental impact from ODS production at OJSC "Khimprom" are:

- reactors of CFC synthesis;
- storage tanks of fluorine hydride;
- shop of wastewater neutralization; and
- furnace for incineration of chlorine-fluorine organics.

The documentation on monitoring of CFC production environment impact makes part of general plant documentation.

Air emission of pollutants from ODS production is reflected in the Permit for air emission of pollutants, uniform for the Enterprise. In 1998, in data of statistical reporting, the emissions of pollutants from ODS production have made:

- CFC 11 – 17.3 t;
- CFC 12 – 81.2 t;
- fluorine hydride - 0.6 t;
- hydrogen chloride – 14.5 t;
- CTC – 1.4 t; and
- CFCs 112, 113 and 122 – 25.166 t.

Wastewater. Low concentration alkali water from the scrubber (1-2 % of sodium hydroxide. 8-9% of HCl) is pumped with general wastewater stream to the neutralization shop and than to the biological treatment facility. In 1998 wastewater volume from CFC-11/12 production was 3,415 m^3. It contains organic impurities – 0.02 %, fluorides - up to 7 g/l, chlorides - up to 50 g/l.

Spent antimony catalyst, which is generated in regular production process, is neutralized by sodium hydroxide to reduce its class of danger to III, and diluted in water, dosed by small portions to the station of wastewater neutralization and preparation for BTF (biological treatment facility).of OJSC «Kaustic». The contents of antimony compounds (at decomposition of the catalyst) in the waste water are up to 0,05 g/l.

Prior to neutralization, the retained organic material, primarily carbon tetrachloride, in the catalyst will be removed by steam stripping. These materials will them be recovered. The distillation residues in the amount of 100 kg/year come for incineration to the on site incinerator of liquid organic compounds.

The on-site incinerator of liquid organic compounds was constructed for the purpose of incineration of all fluorine and chlorine containing waste of the Enterprise. The fuel is natural gas, decomposition temperature is 1400°C. The stack gas is treated in scrubbers before emission into the air. Studies conducted in 1998 at OJSC "Khimprom" did not show any dioxin in the composition of stack gases (Table 3).

Table 3

Summary data on optimal regimes of waste incineration and quality of generated waste water and gas emissions

	Incinerated waste			
Parameters	Production of benzilacetate	Production of МФХБ	Production of benzaldehyde	Production of vynyl chloride
м.д. Cl total, %	0,21	12-14	3,3	18
м.д. Нм.д. H_2? total, %	< 0,5	0,4-0,7	0,2-0,9	<0,1
Rate of volume flow of waste submission, l/h	200	150	150	100
Air consumption in cyclone burner, m^3/h	2500	200	2700	1200
Natural gas consumption, m^3/h	35	45	35	50
Temperature in cyclone burner, °.C	1400-1500	1400-1500	1400-1500	1400-1500
Rate of volume flow of flue gases after scrubber, m^3/h	4900	4200	4900	3000
COD of condensate from flue gases, mgO^2/l	43-72	64-76	37-70	28-37
Contents harmful admixtures in flue gases after scrubber, mg/m^3:				
HCl (designed - 1300 mg/m^3)	1,0-1,5	до 5	до 2	до 30

CO (520 mg/m^3)	До 10	до 50	до 25	до 15
NOx (до 150 mg/m^3)	н/о	н/о	н/о	н/о
Cl_2 (отсутствует)	н/о	н/о	н/о	н/о
P_2O_5 (up to 233 mg/m^3)	н/о	н/о	н/о	н/о
Rough efficiency of flue gases cleaning from HCl и P_2O_5	99,75	99,90	99,90	99,86
Amount of waste water, m^3/ton of waste Designed composition of waste water, g/l:	3-5	6-9	8-12	до 20
pH 7.5-10	7.%-9,7	7,5-10	7,5-9,5	7,5-9,5
Dry residue up to 85 g/l	25,0-30,0	30-60	25-50	28-40
Suspenede matter – absent	0,1	0,1-1,1	0,4-1,7	0,3-0,4
COD - absent	0,11-0,13	0,10-0,16	0,11-0,12	0,09-0,11
NaCO3	3,5-5,0			
NaCl	-	-	-	-
Chromatographically detected components of waste - absent	Н/о	н/о	н/о	н/о

The Enterprise regularly controls the quality of stack gases and wastewater (Attachment 13). Before each operation of the incinerator, the Enterprise coordinates the Program of Incineration Operations with Goscomecology of Volgograd (Attachment 14).

Solidwaste from CFC production is attributed to class IV of danger and are represented by out of service rubber auxiliary materials, paronite, and zeolite, which have made about 0,8 t in 1998. Solid waste in a mixture with other kinds of waste of the Enterprise are exported for disposal to section 2 of the pond-accumulator of OJSC "Kaustic"

Safe management of operations

The management of all operations on ODS production is carried out according to the technological rules of State Mining and Technical Supervision, authorized by the management of OJSC "Khimprom" in regular order. All process control of ODS production was carried out remotely from the control board, that provided safety of attendants at normal mode of production, in case of deviations from it, and at emergencies. All staff was supplied with means of individual protection.

V. CHARACTERISTICS OF CFC 11/12 AND CFC 113 PRODUCTION CLOSURE PLAN AT OJSC "KHIMPROM"

OJSC "Khimprom" undertakes to close production of CFC 11, CFC 12, and CFC 113.

Closing of CFC 11/12 production

The OJSC "Khimprom" assumes to close production of CFC 11/12 on the installation with capacity of 24,000 t/year and to convert three of four lines of synthesis for production of HCFC 22. The fourth line will be closed completely. To ensure the liabilities of the Enterprise on closing production of CFC 11 and CFC 12, it should execute:

- removal of the CTC feeding line into the shop of CFCs production;

- control of procurements, production, testing and disposal of CTC;
- construction of a stationary line of chloroform feeding (used for production of HCFC 22) from the installation of its production;
- removal of all equipment allowing to unload railway cars on the production site to reduce to minimum a possibility of delivery of other raw material (for example, CTC); and
- removal from operation facilities of one of four lines of synthesis.

Closing of CFC 113 production

OJSC "Khimprom" assumes to stop production of CFC 113 on a permanent basis on installation with capacity 18,000 t/year. In the future, the Enterprise plans to organize production of inhibited hydrochloric acid on the released equipment. To ensure the shut down of CFC 113 production, the Enterprise should execute the following measures:

- removal of the chlorine feeding system;
- detachment of lines of perclorethylene and hydrochloric acid feeding and detachment of the control system of production;
- removal of the railway car filling line;
- partial removal and detachment of synthesis reactors;
- detachment and sealing of rectification columns; and
- detachment and partial removal of the product line to the CFC 113 filling station.

The measures on closing CFC 11/12 production at OJSC "Khimprom" are presented in the ODS production Closure Plan. The control of earlier "accumulated" CFCs is stipulated on both directions.

VI. INFLUENCE OF THE CFC 11/12 AND CFC 113 PRODUCTION CLOSURE PLAN ON THE ENVIRONMENT

The main environmental impact of the ODS Production Closure Plan at OJSC "Khimprom" is related to the increase of production waste amount. All waste and residual products have the same volume and composition, as the waste, which was generated at regular service of the indicated production. The processing and disposal of waste will be made according to the permits of the State Committee on Environmental Protection of the Volgograd oblast. The operations on removal, loading, transportation and disposal of waste will be made according to the Instruction on the Order of Collection, Storing, Transportation and Accounting of waste. The safety precautions, fire-prevention safety and industrial sanitary were authorized by the Chief Engineer of OJSC "Khimprom" (Attachment...)

As the closure plan studies have shown, the waste which is generated during closing of ODS production includes:

at CFC 11/12 production:

- residual CFC 11/12;
- spent antimony catalyst (1,8 tons) - will be removed from the reactors (1,8 t), fed into separate tank, decomposed by alkali up to alkaline media (transfer into Class III of danger) and diluted in water, then dosed by small portions to the station of wastewater neutralization and preparation for BTF (biological treatment facility). Antimony hydroxide within overall enterprise's wastewater is fed to the BTF of OJSC «Kaustic». Content of antimony in overall enterprise's wastewater does not exceed the BTF requirement (i.e. is not detected by methods of chemical analysis). OJSC «Khimprom»

has the continuous agreement with OJSC «Kaustic» for use of BTF. Control over regime observation is kept by OJSC «Kaustic» and sanitary services of Volgograd;

- residual organic pollutants - about 100 kg (will be burnt in the incinerator with injection of liquid fuel at OJSC "Khimprom" during the allowed periodic incineration of plant's waste); and
- wastewater from the scrubber in volume of about 20 m^3 (1-2 % of sodium hydroxide, 8-9 % of HCl) will be removed through the plant's wastewater treatment system.

at CFC 113 production:

- spent antimony catalyst (3 t) will be removed from the remained charged reactor into a separate tank decomposed by alkali up to alkaline media (transfer into III calss of danger), diluted in water, dosed by small portions to the station of wastewater neutralization and preparation for BTF (biological treatment facility). Antimony hydroxide within overall enterprise's wastewater is fed to the BTF. Content of antimony in overall wastewater does not exceed BTF requirement (i.e. is not detected by methods of chemical analysis);
-
- flushing water (from washing the catalyst) will be neutralized and discharged through the system of wastewater treatment to biological treatment facility; and
- residual CFC 113 in storage tanks will be subjected to washing and blow-down for the purpose of extraction, at it only insignificant amounts of this substance can get into the air.

VII. ENVIRONMENTAL AND RELATED SOCIAL CONSEQUENCES OF THE CLOSURE PLAN IMPLEMENTATION

The Closure Plan developed by OJSC "Khimprom" together with the Consultant was submitted by the Enterprise for consideration and coordination to the State Committee on Environmental Protection of Volgograd oblast (Attachment 17).

Social consequences of the Closure Plan implementation

Employment problems. 198 persons are now engaged in CFC 11/12 and CFC 113 production at OJSC "Khimprom". The redistribution of 173 jobs inside the Enterprise is planned: a part of workers remain in the same shops for production of CFC 22, the others will be transferred to new productions (filling operations, production of inhibited hydrochloric acid, etc.). 25 persons will retire on a pension.

Health impact. The risks of impact on health of workers from the Closure Plan implementation are only connected to probability of violation of labour safety rules. The responsibility for it bears the Enterprise, and the monitoring is realized by the Labour Safety Service.

The responsibility of observance of the rules of safety by staff of structural divisions OJSC «Khimprom», sufficient qualification of the workers and knowledge by them of the safety and sanitary rules is assigned to the senior officials of these structural divisions. Besides, the instruction on the order of collection, storage, transportation and organization of the accounting of waste is introduced at OJSC «Khimprom» - Engineering safety and industrial sanitary (IRDP 0-70-97).

Public participation. At preparation of the Closure Plan, during pre-appraisal mission, the Enterprise has held a first meeting with the public representatives, during which the main aspects of the Closure Plan and possible environmental and social consequences of its implementation (Attachment 18) were discussed. The representatives of public organization of Krasnoarmeisky district "Ecology", urban and oblast Committees on Environmental Protection, Enterprises OJSC "Kaustic" and OJSC "Khimprom" have taken part in the meeting. The arlandfillments on organization of environmental monitoring of fulfillment of measures included in the Closure Plan were made. It was also proposed to illuminate in mass-media the progress in the Closure Plan implementation.

Environmental Consequences of the Closure Plan Implementation

The realization of the ODS Production Closure Plan at OJSC "Khimprom" is carried out according to the Resolution of the Government of the Russian Federation "On prime measures for fulfillment of the Viennese convention on ozone layer protection and Montreal Protocol" and under the London Addendum to the Montreal Protocol on ozone layer polluting substances. Besides, positive environmental consequences of realization of the given plan will be:

- termination of air emissions of pollutants related to ODS production;
- reduction of volumes of acid wastewater and, as a consequence, reduction of technogenous load on the biological treatment facilities; and
- reduction of volumes of solid industrial wastes arriving to the landfill.

Within the funds received for the Closure Plan implementation, the Enterprise can realize a number of nature protection measures related to cleaning of the territory from pollution and to strengthen the nature protection service by modern monitoring devices.

VIII. ENVIRONMENTAL MANAGEMENT PLAN AT THE CLOSURE PLAN IMPLEMENTATION

Mitigation measures. At implementation of the Closure Plan, the Enterprise is going to realize the following measures on the environment quality management at CFC 11/12 and CFC 113 production:

- cleaning of the main and auxiliary ODS process equipment;
- treatment of waste water formed at washing and neutralization of the main and auxiliary process equipment;
- utilization of the unused raw products;
- collection and removal of waste from the removal of the equipment; and
- incineration of organic residues in the incinerator of liquid organic waste.

To monitor compliance with nature protection requirements and requirements to management of economic activity, the Environmental Management Plan was developed. The plan consists of two parts:

- measures on fulfillment of nature protection requirements (Attachment);
- monitoring of compliance with the indicated measures (Attachment).

In addition to environmental aspects, the Plan includes such social aspects as obligatory employment of workers not required at ODS production closing, training, etc.

Within the framework of the Closure Plan preparation, the OJSC "Khimprom" should develop the justifying documentation (Plan of Organization of Operations and Environmental Assessment) and to submit it to the State Environmental Review. The issue of the conclusion of the state Environmental Review is a condition of coming into force of the Subgrant Agreement.

The indicated measures on environmental quality management are included into the Closure Plan, which will provide the integration of economic and nature protection activity of the Enterprise. The same purpose is also promoted by the List of Environmental Requirements (Attachment 19), designed by the Enterprise under the Closure Plan in line with the requirements of the Russian legislation.

Environmental monitoring. The ODS production closure monitoring at OJSC " Khimprom" is assigned to the State Committee on Environmental Protection of Volgograd oblast by the Order of Goscomecology No 306 dated June 07, 1999.

IX. ENVIRONMENTAL RISKS

The environmental risks at the Closure Plan implementation can arise at:

- removal of reactors of CFC 11/12 and CFC 113 synthesis;
- preparation of spent antimony-containing catalyst for disposal by the Enterprise;
- processing of provisionally stored unused raw products.

The indicated operations are executed by the Enterprise according to the operating standards and rules of State Mining and Technical Supervision of Russia and are also inspected by the Labour Safety Department of OJSC "Khimprom". Taking into account a high level of organization of these operations, environmental risks of emergencies connected to violation of safety regulations should be evaluated as insignificant, and the Enterprise – as capable to supervise them.

XI. CONCLUSIONS

The conducted environmental assessment of the Closure Plan at OJSC "Khimprom" allows to make conclusions that:

- sources of environmental impact of ODS production are completely revealed;
- measures included in the Closure Plan will allow the Enterprise to liquidate available sources of negative impact and to realize a number of nature protection measures;
- environmental consequences of the Closure Plan implementation are related to ODS production closure and to improvement of the environmental situation at the Enterprise and in Volgograd due to reduction of technogenous load on the environment;
- social consequences of the Closure Plan implementations related to the problem of employment of workers, occupied at ODS production, are resolved due to redistribution of the staff inside the Enterprise;
- Environmental Management Plan, designed within the framework of the ODS Production Closure Plan at OJSC "Khimprom" will allow Goscomecology of Russia to realize monitoring of the progress of realization of measures included in the Closure Plan.

XII. RECOMMENDATIONS

The Enterprise should finish preparation of the justifying documentation for closing the ODS production and to submit it to the State Environmental Review to the State Committee on Environmental Protection of the Volgograd oblast.

Attachment

ENVIRONMENTAL MANAGEMENT PLAN FOR ODS PRODUCTION CLOSURE PLAN IMPLEMENTATION AT OJSC "KHIMPROM"

No		Nature protection measures	Deadline
Measure on CFC 11/12 production closure			
1	Extraction of residual CFC 11/12	Closing of the production system will be made in phases in conditions of vacuum. The extraction will be made in tanks, therefore direct emissions of residual evaporation into the air will be insignificant.	9/1/00
2	Removal of spent catalyst	Removal of antimony catalyst from reactors, its neutralization to form antimony hydroxide, pacakaging for storage and future offsite recovery of antimony, or disposal as a Class III waste at OJSC «Kaustic»'s permitted landfill.	9/1/00
3	Elimination of residual organic pollutants	Residual organic materials extracted from catalysts (about 100 kg) will be burnt in the incineration with injection of liquid fuel.	9/1/00
4	Cleaning of the production equipment	Low concentrated alkaline flushing water generated at cleaning of the production equipment during preparation for HCFC 22 production will be neutralized and discharged through the system of industrial wastewater treatment to biological treatment facility.	9/1/00
5.	Removal of wastewater from the scrubber	Polluted water from the wet scrubber in volume about 20 m^3 (1-2 % of sodium hydroxide, 8-9 % of HCI) will be discharged through the plant's wastewater treatment system to biological treatment facility.	9/1/00
Measures on CFC 113 production closure			
6	Removal of catalyst	Catalyst (3 tons) will be removed from the stayed charged reactor (254), neutralized, with the precipitated antimony hydroxide being packed for storage and potential recovery of antimony offsite or disposal as a Class III waste in OJSC «Kaustic»'s permitted landfill.	9/1/00
7	Receiving of product and cleaning of storage tanks	The storage tanks will be washed and blown-down to extract residual CFC 113, at it only an insignificant amounts of this substance can get into the air.	9/1/00
8	Consultations with public and staff of the Enterprise	Public consultations on the Closure Plan implementation will be continued among the local population of Kirov district of Volgograd with engaging of local non-governmental organizations, Goscomecology of Volgograd and oblast. At consultations, the Enterprise will inform the public on proposed measures. Regular meetings with the workers engaged in the Closure Plan will proceed for their retraining and employment.	Ongoing

9	Deriving the permits of local organs	Submission of justifying documentation on the Closure Plan to the State Environmental Review of the Volgograd oblast, which will include the Technical Substantiation and the Environmental Assessment. The issue of the Permit of the state Environmental Review is a condition of validity of the Subgrant Agreement.	9/1/00

Attachment

VERIFICATION PLAN
OF FULFILLMENT OF MEASURES
ON CLOSING CFC 11/12 AND CFC 113 PRODUCTION AT OJSC "KHIMPROM"

No	Nature protection measures	Measures of monitoring
1	2	3
1	Removal of the spent catalyst	(1) To study records on production closing to check up pretreatment of catalysts extracted from reactors and disposal of antimony hydroxide and waste water. (2) To study and to write down parameters of discharged wastewater for period of realization of catalyst removal.
2	Disposal of residual organic pollutants	(3) To check up safety of storage of residual organic materials extracted from catalyst. (4) To study and register incineration parameters and data on air emission monitoring during elimination of these materials.
3	Cleaning the equipment	(5) To study records of measures on production closing to verify the collection and removal of flushing water by the system of wastewater treatment. (6) To study and register parameters of discharged wastewater samples during the removal of flushing water.
4	Removal of wastewater from a scrubber	(7) To study records of measures on production closing to verify the collection and removal of wastewater from the scrubber by the system of wastewater treatment. (8) To study and register parameters of discharged wastewater samples during the indicated removal of wastewater from the scrubber.
Measures on CFC 113 closure		
5	Removal of catalyst	To study records of closing process to verify washing of the catalyst extracted from reactor 254, storage of antimony hydroxide, and its as disposition To study parameters of samples of discharged wastewater for this period.
6	Consultations with the public and staff	To analyze proceeding public consultations related to closing of old production and beginning of new, including contacts (if necessary) with Committee on Environmental Protection of Volgograd, non-governmental organizations and staff.

7	Social impacts	To analyze current records of staff employment in former CFC 11/12 and CFC 113 production and transfer of staff to other productions.
8	Observance of the rules of law	To look through the permits related to former CFC 11/12 and CFC 113 production (emission, discharge, disposal of waste). To consult the Committee on Environmental Protection of Volgograd concerning observance of the issued permits, fulfillment of the environmental impact monitoring schedule and submission of reporting