LIMITED LIABILITY COMPANY. «SCIENTIFIC AND PRODUCTION ENTERPRISE GREEN PLANET»

453030, REPUBLIC OF BASHKORTOSTAN, ARKHANGELSK DISTRICT
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INFORMATION LETTER

Considering the rather high industrial level of production development in the world, which inevitably entails the problem of pollution of the habitat of the Earth's population, we created in 2020 NPP Green Planet LLC, the main goal of which is not only to promote the treatment complexes already produced by Ecological Group LLC and installations of the **ALPHA** line, based on electro-chemo sorption principles, but also their further development and application in the most unexpected, it would seem, cases. I would especially like to emphasize our desire to create a closed, waste-free production chain.

Conventionally, all installations according to their applicability in the production cycle can be divided into the following seven areas.

1. **CLEANING OF WATER STREAMS**. The general situation about the systemic crisis in the water industry, about the relevance of wastewater treatment and how it is related to water treatment, about the methods used to intensify water treatment is quite fully described in the article by Ph.D. Novikova O.N. The relevance of wastewater treatment. (http://ecoalfa.ru/aktualnost-ochistki-stokov).

A. Purification of natural water to the standards of drinking water, including hardness salts. A distinctive feature is the ability to individually select a chain of equipment for specific tasks (up to water purification from arsenic).

B. Treatment of water wastes, including:

1) sewage / fecal wastewater (capacity from 1 m3 / hour to 15 m3 / hour per one technological line);

2) household and storm waste water;

3) waste water from industrial enterprises, mechanical processing and painting industries, electroplating from heavy metals, mechanical impurities, oil-emulsion effluents (including coolant), phenols, arsenic, antimony, cyanides, etc .;

4) fat drains from meat processing plants, oil and fat industries, bakeries, confectionery, poultry farms, construction industry plants, etc .;

5) water effluent from mining and processing plant and gold recovery factories, including from cyanides

6) oil-contaminated water runoff (including drilling fluids and process fluids used in the operation of oil and gas fields), sub-shale waters in sea and river ports, when cleaning oil tanks, railway tanks;

7) associated oil waters with additional extraction of industrially significant elements (iodine, lithium, strontium, bromine, calcium, magnesium);

8) water purification from hardness salts (descaling) with bringing its quality to the most favorable for its use in boilers, etc .;

2.**PROCESSING OF SOLID, CARBON-CONTAINING WASTE** into water gas using catalytic cracking processes in a steam environment.

A. From polymeric, plastic waste without sorting.

B. From bitumen, tar, etc.

3. **PRODUCTION OF BIOFUELS**.

A. Low-grade coal

B. From plant biomass materials, including wood-based waste.

4. **PURIFICATION OF COMMERCIAL OIL AND REFINING PRODUCTS FROM SULFUR AND METALS**.

A. Processing of marine fuels (fuel oil) in order to reduce the sulfur content to the required by today's standards 0.5% with additional purification from metals or without purification from metals.

B. Extraction of vanadium, nickel, titanium and other metals from heavy, high-sulfur oils, heavy residues of oil refining at refineries (including waste with an oil content of more than 65%).

5. **EXTRACTION OF RARE EARTH MATERIALS**

A. from tailing dumps of mineral enrichment plants and gold recovery factories, from ash dumps of CHPPs operating on coal and fuel oil using heap acid and alkaline leaching technologies.

B. from associated formation waters during oil and gas production (bromine, lithium, strontium, iodine, etc.)

6. **PROCESSING OF DRILLING SLUDGE WASTE** into technogenic soil. The complex completely recycles all types of household and industrial waste generated during the development and operation of oil and gas fields. Especially effective for remote fields.

7. **EXTRACTION OF ESSENTIAL OILS** from vegetable raw materials using steam extraction. At the exit, essential oils and hydrolates.

Sincerely, General Directors: **LLC "Ecological Group"** O.N. Novikov, Ph.D., and **LLC "NPP Green Planet"** V.A. Kuznetsov, Ph.D.

Wastewater treatment plants Alfa have successfully passed the state examination and have certificates of conformity and sanitary and epidemiological conclusions. Our complexes for local wastewater treatment have been operating for a long time in the most severe climatic conditions of the Far North and have shown their effectiveness regardless of natural conditions.

Regular customers are mining industry enterprises with which long-term and mutually beneficial forms of cooperation have been established. Wastewater treatment in the Alpha complexes is carried out up to the MPC standards.

Wastewater

The Alfa complex for the local treatment of industrial effluents has technical solutions that guarantee its efficiency regardless of the concentration and nature of the pollutant, the absence of secondary pollution, solutions are provided for the disposal of sediments, sludge, independence from natural conditions and power outages. The technology of electrochemisorption wastewater treatment in the Alpha complexes is capable of effectively purifying water from any types of pollutants (both biological and man-made xenobiotics). Local treatment complexes Alpha have found their application at enterprises of the defense industry, mechanical engineering, the automotive and fuel and energy industries, and the mining industry. **(TU 3697-001-57677805-03, Certificate of Conformity No. ROSS RU.AYA56.B16072)**. The supply of consumables has been established. The systems of local water circulation of electroplating industries are very effective, they completely protect the hydrosphere from toxic heavy metals. Inexpensive and extremely effective technical and design solutions have been developed for the cleaning construction industry, the paint industry.

From design to commissioning

The enterprise LLC "Ecological Group" and (or) LLC "NPP" Green Planet" will carry out design work in terms of technology, using technological studies according to the proposed technology, as well as in the environmental protection sections - EIA, PNOOLR, calculations for MPE and other required calculations ... Having experience in performing the listed types of work, we significantly reduce the total cost of building local treatment facilities. We manufacture our complexes ourselves.

As an example, we give a description of the operation of one of the modifications of the Alpha Unit, intended for the production of a disinfecting solution of sodium hypochlorite (GPCN) directly at the point of consumption. The essence of the method lies in the fact that under the action of the current from the salts in the treated water itself, strong oxidants are formed, which mainly destroy microorganisms. All these

processes take place in one apparatus - an electrolyzer when disinfected water passes through it. The chloride content in water should be 25-30 mg / l. Disinfection of water by direct electrolysis is a type of chlorination, therefore, all methods for controlling water quality and the effect of disinfection used in chlorination can also be used in electrolysis. Electrolyzers of the company LLC "Ecological Group" operate on solutions of table salt of high purity (reagent grade) and produce active chlorine. The principle of operation is associated with the uniform transformation of the saline solution into sodium hypochlorite, passing through the system of electrode blocks. The concentration of the resulting sodium hypochlorite 5 - 92 g / dm3; the content of active chlorine in the resulting hypochlorite is 5-70 g / l; specific power consumption for 1 kg of active chlorine - 5.1-5.3 kWh; specific consumption of table salt - 4.7 - 3.5 kg / kg. The design is based on insoluble electrodes. Sodium hypochlorite is obtained by electrolysis of sodium chloride solution with a concentration (4-18%).

At present, active work is underway on the creation of a new modern site, which will more fully answer many questions that are so interesting to our customers.