

## INVESTMENT PROPOSAL

22.09.2012

The proposal should clearly define an innovation (technology/product) that will be addressed through the application. It is important that a convincing case be made that what is being proposed is both reasonable and achievable. All format sections must be completed in order to receive consideration. The proposal should be succinct and clear. Do not assume that the people reviewing it know any information about your organization, your project, or the users you are trying to impact. Please attach presentation quality photos, charts or/and pictures.

1. INNOVATION/PROJECT HOLDER/INITIATOR " Ecological group Ltd ", Novikov Oleg Nikolaevich, 7-(952) 057-45-54.  
PROJECT TITLE Buildings of clearing of sewages for small and average economic objects.

3. TECHNICAL DESCRIPTION Describe in detail the technology that will be involved with the project, the rationale in selecting this particular technology, and how the various components will be organized. This section should be specific and concrete so there can be no confusion as to what the technology being proposed will do and how it will work. It is recommended that a diagram or other illustration depicting the overall design or major process/system be included. This should not only include detail on how the proposed technology will work, but also:

What problem does your technology address?

How innovative is the proposed technology?

Why this technological alternative(s) is superior to others?

How it would operate with other systems?

How it can manage by users?

How to maintain the proposed production/service system?

Description of the complex of kettles Alpha The modular system Alpha TC 3630-001-41774475-98 is characterized by universality, high efficiency and absence of limitations on density of industrial waste water. The system is assembled out of sequentially joined modules. Owing to the connection of parallel modules the system has no limitations on productivity. The sphere of application of the system includes purification of waste water on enterprises of food processing, oil, chemical and machine-building industries. The system looks very promising for the use in home construction since its cost does not exceed one-tenth of private cottage construction estimate. It should be taken into consideration that one system might serve a settlement of 2000 cottages. The system ensures purification from: suspended matters, petroleum, fats, sulphurous compounds heavy metals, phenols, dissoluble organic compounds, available chlorine, salts of hardness, ammonia, volatile smelling substances, nitrites, colloidal admixtures, phosphates, pigmented substances, microorganisms. The deacidizing and diminishing of the content of salts can be carried out through the removal of alkali metals and acids. There are three variants of complex. Depending on the problem solved by the complex and the type of purified water the body is made of steel (Alpha - 7), vinyl plastics (Alpha - 8), stainless steel (Alpha - 9). For corrosion protection Alpha - 7 is supplied with an electric guard. This variant is more often used in purification of waste water, if subsequent secondary usage of purified water is not supposed. Alpha - 9 with its non-corrosive body is expedient to be used in those places where the waste water is highly aggressive. Alpha - 8 is employed in those circulating systems of water consumption where it is necessary to eliminate the migration of iron. The work of purification plants leads to the formation of precipitates, slimes. For their salvaging through oxidation and evaporation of water, modules Alpha - 7Y are applied. After oxidation and evaporation, slime can be used in construction. If concentrated slimes contain volatile components, module Alpha - 9Y - 100 can be used for the complete salvaging of the volatile substances. The ALFA complex can also be used for air purification, its efficiency is not less than 98%, the volume discharge being over 50 m<sup>3</sup>/h. For purification of waste water of heavy metals and localization of harmful admixtures near the source of contamination salvaging of slimes containing heavy metals module Alpha - 8 - M

is used. The module allows to strip waste water and slimes of heavy metals, including copper, quicksilver, iron, lead, zinc, cadmium, chrome - 3, chrome - 6, nickel, cobalt, tin. The metals precipitate as a concentrate, from which one can obtain original salts through evaporation and crystallization. The feature of this module is that it can be installed inside a shop which allows to decrease the volume of consumed water. The small sizes of such modules make it possible for them to be mounted within the industrial spaces. The system Alpha can be applied not only for purification of waste water, but also for such industrial processes as soap making, deriving of washing liquids from spirit waste products, extraction of perfumery raw materials from plants, in hydrometallurgical technologies, processing of natural pickles, deriving of amino acids from protein, penetrating rectification of spirit from methanol, biotechnology.

Tabl 1.

Technical and operating characteristics.

Equipment	Purpose	Volume m3	Sizes, m	Purification effect, %	Price, C.C.
Mechanical grating Alpha - 9 P	For removal of coarse – suspended matters of the size of more than 10 mm.	Two containers, 50 kg each	0,6*1*1	95	2200
Pressure tank Alpha - 9 НП	For pre-purification, electroflotation, flotation of suspended particles, averaging	4	0,8*2*2	50-80	2900
Reactor Alpha - 7 BC	For oxidation of dissolved admixtures	0,25	0,8*0,5*0,6	50-80	2000
Adsorber Alpha - 7 XC	For purification from dissolved admixtures	0,25	0,8*0,5*0,6	80-99	2000
Precipitation tank Alpha - 7 OT	For precipitation of suspended matters and admixtures	18	2*3*3	50-80	3000
Power supply block Alpha PB 30 kWt	For power supply of modules		0,8*1,0*5		6000
Reactor Alpha - 8 BC	For oxidation of dissolved admixtures	0,25	0,8*0,5*0,6	50-80	2600
Adsorber Alpha 8 XC	For purification from dissolved admixtures	0,25	0,8*0,5*0,6	80-99	2600
Reactor Alpha - 9 BC	For oxidation of dissolved admixtures	0,25	0,8*0,5*0,6	50-80	2800
Adsorber Alpha - 9 XC	For purification from dissolved admixtures	0,25	0,8*0,5*0,6	80-99	2800
Module of utilization Alpha - 7 Y	For oxidation and evaporation	0,25	0,8*0,5*0,6	99	2500
Module of utilization - 9Y - 100	For utilization of volatile pollutants, oxidation and evaporation	0,04	0,5*0,5*1,6	99	3100
Block of thin - layer precipitation	For intensification of the precipitation process	1	1*1*1	80	200
Alpha - 8 M	For purification from heavy metals	0,2	0,5*0,6*1,2	99	2200

The existing water-treatment equipment designed in the middle of twentieth century cannot provide adequate

environmental protection. The present refining buildings do not provide normative clearing of water. They do not fulfil the most composite task of clearing of sewages - deleting of organic pollutants, do not warrant a complete decontamination of water. Most often this problem can be solved using biological oxidation in aeropacks and ozonation. The former facilitates the removal of only biological impurities constituting less than half of all concomitants. The latter requires large expenditures, as the cost of ozone is comparable to that of gold. Moreover, ozone is toxic and explosive. A more effective method is oxidation in the presence of air oxygen when an electron beam is fed from the accelerator onto the water mirror. As the accelerator efficiency is very small, the energy costs are incredibly high. So, the problem may be solved only using modern methods of physical-chemical treatment of waste as an important stage in the development of ecologically safe industry. A team of Irkutsk scientists has developed and introduced into practice a high performance method of water treatment, which has no analogs worldwide. The technique combines some features of different physical-chemical methods such as filtration, floatation, electrodeposition, chemisorption. A unique method involving electron generation directly from the electrode into the aqueous medium has been used for the first time. Under the effect of electrons chain processes of oxidation are induced in water in the presence of air oxygen. Then the water is subjected to final treatment in the sorbent. Integrated and unified application of these procedures allows waste water cleaning to a safe level. The use of high performance sorbents is able to make any water from natural source optimally useful for human. The efficiency of removing organic pollutants and suspended substances from industrial waste is 96.5 and 99.9%, respectively. The use of high-density current (over 50A/m<sup>2</sup>) and highly active sorbents during water treatment assures complete removal of microorganisms. Engineering decision of the idea is incarnated in an ALFA module system, [7], which is distinguished by universal character and absence of pollutant concentration limitation. The system is assembled out of separate modules connected in series. Moderate weight of modules allows fast assembly on the field. Due to the connection of parallel modules the system has no productivity restrictions. Manufacturing of the system is based on the UPGRADE principle. The system parameters can be drastically improved by installation of auxiliary suspended equipment. This opens the way to further modification. A minimal ALFA complex is capable of purifying up to 10 t of water, the energy consumption being 7-10 kWt (not exceeding that of domestic electric stove). The use of the ALFA complex is profitable, all the expenditures recoup themselves within several months. Capital expenditures do not exceed the cost of a car. This is some scores times cheaper compared to analogous, but less efficient systems. The high performance of ALFA water-treatment complex is illustrated by digital data presented in the Table. Table ALFA complex efficiency indices on the example of motor vehicle washing sewage (mg/dm<sup>3</sup>).

Tabl 2.

Effect of purification.

<i>Indices</i>	<i>Prior to treatment</i>	<i>After treatment</i>
TOC	1200	8
ChOD	1000	8
BOD-5	500	4
SS	12000	5
Petroleum products	1300	0,05
Coli-Index	100000	0

*A feature of the system is reciprocal amplification of the oxidation and sorption factor. The use of sorbents of new generation at linear rates of up to 15 m/h gives a high purification degree. Electrolytic oxidation provides pretreatment of sewage for sorption. The sorbent additionally functions as an oxidation catalyst. The oxidation process continues in the sorbent layer as well and this facilitates sorbent regeneration. The new method is excellently compatible with the use of flocculants and coagulants. A slight change of tuning is sufficient that a stage of floatation or electrofloatation will be introduced into the flow sheet We would like to see the ALFA complex to be a standard equipment enabling such methods as biosorption, chemical oxidation, catalysis, etc. to be employed. This process of sewage treatment is a physical-chemical one. It has been studied in much detail. Its characteristics may be calculated on the basis of the known initial concentrations of pollutants. In sewage purification works the builders may use optimal technological schemes. Manufacturing process. The manufacturing process of clearing of sewages consists of sequentially executable operations. The electrical chemical sorption purification method combines in itself tags of different physicochemical*

purification methods. The substance it(him) consists in generation of electrons immediately from a welding rod in an aqueous medium. Under operation of electrons the free radicals will be derivated. Oxygenium decomposes organic matters in their presence.

A). The electrofloatation in the tank Alpha - 7 provides deleting hydrophobic suspended matters. The process of neutralizing provides regulation of the environment up to optimal for an oxidizing pH =8-8,5.

B). Process of a chain electrooxidizing of dissolved organic matters in units Alpha - 7VC.

C). Process of settling of hydrophylic suspended matters in a settling tank. The flocculation speeds up the process of settling.D). Filtering from suspended matters in a lower zone of units Alpha - 7XC (filters adsorbers).

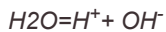
D). Sorption of hydrophylic dissolved organic matters in a upper zone of sorption units.

The manufacturing process includes:

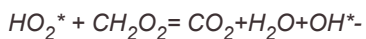
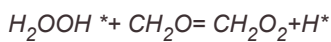
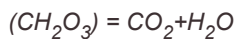
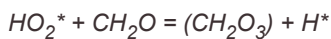
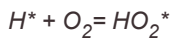
- Electrolysis with electrofloatation in gravity tank;

- The electrolysis in electroreactive vessels includes:

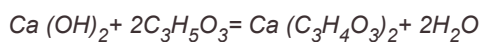
- Electrodecomposition of molecules of water with derivation of primary free radicals:



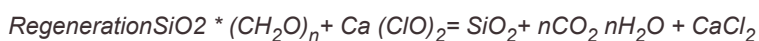
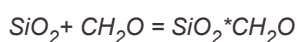
Oxidizing by Oxygenium of air.



Precipitation of calcium salts



Sorption of dissolved organic matters.



**Applications of the refining "ALPHA" system** The table 3.

## Applications of "ALPHA" systems

Objects	Complete set	Productivity	Concentration	
			Inlet	Output(exit)
Settlement on 2000 inhabitants on reset in a pool.	Mechanical lattice, gravity tank four an electroreactive vessel, two adsorptive units, settling tank, compressor, power supply unit and handles on 12-16 kw.	Up to 10 cubic meters at one o'clock. By a degree of clearing up to 95 %.	BOD -300SS - 300	26
Bulk plants, servicing depots, factories, motor depot	Settling tank two an electroreactive vessel, two adsorbers, compressor, power supply unit and handles 7 kw.	Up to 9 cubic meters at one o'clock. A degree of clearing 93-98%	Petroleum-50SS -100	0.056
Campings, hotel, hospital	Lattice, settling tank, electroreactive vessel, adsorber, compressor, power supply unit and handles 4 kw.	Up to 5 cubic meters at one o'clock. A degree of clearing 93-98%	BOD - 400SS - 500	26
Galvanic shop with partial water recirculation or selfcontained water facilities.	Electroreactive vessel, adsorber, settling tank, compressor, power supply unit and handles, filter. Consumed power 12 kw.	Up to 5 cubic of meters at one o'clock. A degree of clearing 92-98 %.	Cu-200 Zn-100 Hg-10 Cr(6)-100 Cr(3)-100	0.01 0.02 0.0003 absences 0.0007

**5. INTELLECTUAL PROPERTY RIGHTS/PROTECTION** Indicate what kind of intellectual property protection you employ: **Patent** The patent RU №98121248 « a Way of carrying out of an electrolysis ». The priority is affirmed 01.12.98.а. the writer: Oleg Novikov The testimony on useful model « the Floatation system » №19530 priorities from 15.06.2001а. under the indent №2001104640 .

**Trademark or brand name protected** Brand mark №231730 under the indent №2001706452 from 05.03.2001а. The holder(owner): « Ecological group » Concerning following bien et service: 01-matters for clearing (defecation), chemical agents for clearing (defecation) of water; matters for clearing of gass; chemical agents for clearing of oils; fining agents for the industrial purposes; dispersions of plastic; plastic raw. 09-measuring sensors; measuring instruments electrical. 11-purification plants of water; installations and kettles, except for computers for clearing of water; kettles and computers for clearing of air; purification plants (filtering) of air; inventory for clearing of gass; inventory for clearing of oils; sewage treatment units; sanitary - technical inventory.

**Copyright** « Ecological group »

**Know-how** There is a know-how and KNOW-HOW.

Who is the owner of the technology or/and product? Dr Oleg Novikov.