СЕКЦИЯ «СТРОИТЕЛЬСТВО, АРХИТЕКТУРА, ДИЗАЙН»

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SAFE WATER-SUPPLY SYSTEMS

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Abstract. *The Water-Supply Systems to function effectively for many years. On the basis of the technology implemented schemes wastewater household and industrial facilities with the software reuse effluents in the manufacturing processes.*

The technological complex of uninterrupted water-supply and sanitation system (SUW complex) is the result of intellectual work and scientific experience of the writing group.

The main characteristics of SUW (table 1):

- non-chemical cleaning;
- automatic operation;
- absence of removable elements for water treatment (cartridges, filling the filter);
- self-dependent regeneration system;
- minimum of footprint;
- operates under conditions of salvo blowout of water pollutants.

Table 1. – Indicators of water treatment by SUW

№	Indicator	Unit measure	Content of elements in water	
			Before the treatment	After the first treatment
1	Suspended solids	mg/dm^3	15000	5,0
2	Petroleum products	mg/dm^3	250	3-5
3	BOD5	mg/dm^3	300	200
4	The dry residue (for ballast water)	mg/dm^3	18000	900
5*	Chlorides	mg/dm^3	250-600	200
6*	Sulfates	mg/dm^3	600	200
7*	Nitrates	mg/dm^3	50	5 - 10
8	Detergents	mg/dm^3	5,0	0,01
9	Sanitary bacteriological indicators		Not limited	Sanitary standart
10	Total iron	mg/dm^3	20-30	0,08-0,13
11	Zinc	mg/dm^3	30-40	0,081-0,13
12	Copper	mg/dm^3	10-15	0,06-0,14
13	Reaction pH	-	3,7 – 8,7	6,5 – 9,0

* - Removal of chlorides, sulfates and nitrates are all within 40% of baseline, depending on the pH, the total salt content at the raw water in one pass of the polluted water through complex SUW. For two passes, the content of chlorides, sulfates, nitrates reduced by 2 times, in three passes – for three times and so on.

The complex has carried out the treatment of manufacturing water and has successfully provided the reuse of water in the following establishments:

- the "Kiev communal services "Stolychnyy", Kiev.

The company has carried out the washing and dry-cleaning of clothes.

The implementation of the SUW complex at this company helped to reduce:

- the water consumption from water pipeline by 95 %;
- discharge of wastes into the sewer by 95%.

Safe mud-filtrate in dry form (class “building refuse”) was received and used for needs of building industry.

The complex has allowed to provide the technology needs of the company in water volume of 80 m^3 per day;

- the "Kiev factory "Electric", Kiev.

The SUW complex has carried out the treatment of contaminated water after galvanizing (-bath) room with followed water delivery to the manufacture.

At the output after such treatment was formed:

- thickened mass of hydrophobic material which suitable for recycling or use as a filler in the manufacture of building materials;

- water with technical parameters of GOST 9.314-90 "Water for electroplating and leaching circuit ", GOST 9.305-84 "Metallic and non-metallic inorganic coating"

Using of the SUW complex has allowed the factory to reduce water consumption from water pipeline by 70% (namely from 39.5 million m^3 to 11.3 million m^3) and to cut down expenses for water conditioning (table 2).

Table 2. – Results of sludge’s comparative study are given in the table

Metals	**Fixation reliability of heavy metals in sludge, mg / l.**	
	The sludge that was obtained by alkaline reagents’ neutralizing of wastewater	**The sludge that was produced by the SUW complex**
Zn	< 252,00	< 0,01
Pb	< 0,05	< 0,05
Ni	2,50	< 0,05
Cr	5,37	< 0,01

- the "Kiev factory "Quantum ", Kiev.

The complex has carried out the treatment of wastewater at the metal coating area in the volume of 144 m^3 per shift (432 m^3 per day) with followed delivery of purified and treated water (according to the technological requirements) for the needs of the enterprise .

During the operation, the SUW complex formed safe mud-filtrate in dry form (class “building refuse”) which was used for needs of building industry.

- the SPA "Rotor" (which is called "Bogdan" now), Cherkassy.

The SUW complex provided an ion-exchange water conditioning with solution preparation for ion-exchange filters’ cleaning and regenerate processing (neutralization) with the continued use of treated water in the circulating water supply, water recycling of electroplating.

Conclusion

The Safe Water-Supply Systems are the latest developments in the field of the water treatment, able to increase the efficiency of the production processes (reuse of wastewater) and regional ecological security.