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Research Article

GEOMORPHIC FILESERVICE OF RIVERVILLAGE

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ABSTRACT
This article examines the role of the geomorphological conditions of the studied territory in the development of oil pollution of the geological environment from local objects. The degree of migration in conditionally allocated geomorphological areas (where local objects of oil pollution are located), depending on certain features of geological and hydrogeological conditions, is determined. These conditions determine the possible technogenic forms of accumulation of petroleum products in the components of the geological environment.

Keywords: *Geological Environments, Geomorphology, Water Permeability, Underground Water, Aeration Zone, Petroleum Products, Rocks, Pollution, Migration*

INTRODUCTION
The preservation of the consumer properties of groundwater is one of the most important areas of hydrogeology. Due to the growth of the population, the increase in the scale and diversity of man-made impacts on the natural environment, there are significant changes in the quality of underground water. Anthropogenic impact on the environment is now becoming a powerful force that changes the hydrogeological conditions of aquifers, the hydrochemical regime of groundwater. In connection with the development of oil and gas processing complexes and objects of the massif, the geological environment is experiencing a very significant load (Posokhov, 1969; Sedenko, 1971).
The progressive nature of this type of pollution is an increase in the content of petroleum products and harmful micro-components, which occurs within the framework of the standard.

MATERIALS AND METHODS
In the field conditions, the migration of petroleum products through the rocks of the aeration zone to each lithological difference of the soils composing the key areas from the surface was studied. By means of experimental filling of solutions with different concentrations of the pollution ingredients, the change in their concentration with depth, the migration pattern with different aeration zone structure, the relationship between the gross content of petroleum products in the soil and their water-soluble forms, etc., was determined.
Methods of hydrogeochemical forecasts include methods based on empirical generalizations and analysis of hydrogeochemical phenomena in their spatio-temporal sequence, and methods using the principles of physico-chemical hydrodynamics, thermodynamics, and kinetics.

RESULTS AND DISCUSSION
Oil products lost as a result of technological and emergency leaks seep into the ground and reach the first aquifer from the surface through the rocks of the aeration zone. At the same time, several types of pollution of the geological environment are formed, which are closely interrelated and have a direct impact on the nature and extent of pollution (Katz, 1969).
The change and spread of pollution in time and space and the possibility of its negative impact on other components of the habitat are determined by the geological and hydrogeological conditions of the territories (Khasanov and Sherfedinov, 1987).

On the territory of the Republic of Uzbekistan, we can conditionally distinguish several geomorphological areas (where local objects of oil pollution are located), characterized by certain features of geological and hydrogeological conditions (table), which determine the possible technogenic forms of accumulation of petroleum products in the components of the geological environment.

The head parts of the take-out cone. The aeration zone is composed of homogeneous, well-permeable rocks with a thickness of more than 10-15 m. Contamination of the soil of the aeration zone directly under the objects where the leakage of petroleum products occurs. The spread of pollution in the horizontal direction inside the aeration zone is practically non-existent. Infiltrating petroleum products quickly reach the ground water level, which is transported over long distances from the source of pollution.

Thus, in a highly permeable aeration zone (including in the absence of a sufficiently dense and relatively thick soil layer), the greatest oil pollution is exposed to the groundwater horizon. The extent of its pollution depends even more on the volume of incoming petroleum products, since they are almost not retained by the soils of the aeration zone.

When large volumes of oil products and wastewater flow through a highly permeable aeration zone in the aquifer form:

large-capacity lens of petroleum products (gasoline, kerosene, diesel fuel and light fuel oil) on the surface of ground water;

a significant, but more locally concentrated zone of heavy petroleum products in ground waters (heavy fuel oils, oils and their transformed highly viscous heavy components, separated from the latter in the aquatic environment and depleted by the most mobile water-soluble components);

a large (in plan, and in sections and in section) zone of dissolved and emulsified petroleum products in groundwater.

In the unsaturated zone are formed: a specific ("disabled", the low-concentrated) drop-membrane cap oil products are mostly adsorbed oil and unfocused area (above the "film"); highly mobile in highly permeable soils (and hence low concentrated) gas cap oil – like shape, derived in this case from the area of film flow of petroleum products. In the absence of a soil layer in the structure of a highly permeable aeration zone, a layer of oil-activated soils is usually not formed.

With small volumes of oil products and waste water entering through a highly permeable aeration zone, a zone of film spreading is formed and the same forms of accumulations of oil products are formed, but the accumulations themselves are much smaller in scale.

Peripheral parts of the outflow cone, wide river terraces, undivided valleys, modern and ancient river deltas, subaerial deltas, inter-cone depressions. The aeration zone is composed of heterogeneous rocks in the section, represented by an alternation of permeable and weakly permeable interlayers and lenses. It is possible to spread the contamination inside the aeration zone laterally from the primary one along the roof of weakly permeable layers, mainly in the direction of the layers. The degree of contamination of the rocks of the aeration zone is usually high, since a significant part of the oil products is retained inside it in the form of suspended lenses of the verkhovodka type. Low power unsaturated zone contributes to the rapid achievement of petroleum in groundwater levels, the intensity of evaporation of hydrocarbons from the surface of man-made lenses, the possibility of secondary pollution of soil, underground and civil constructions in the process of change in the level of groundwater and the associated level of oil in the lens.

The area of contamination does not extend far beyond the area where the contamination occurs, creating a danger primarily for the object itself, which gave rise to it, where a fire and explosive situation can be created due to the evaporation of volatile components when they reach their surface. In conditions of weak water exchange, with large volumes of oil products, a powerful lens can form at the ground water level. Contamination of the underlying underlying pressure water is unlikely.

Upper terraces and similar areas of low-lying foothill plains. The aeration zone is represented by a thick layer of poorly permeable rocks with a relatively homogeneous lithological composition of the composing soils. When lost petroleum products enter the low-permeable aeration zone, their penetration through the

Typification of geological and hydrogeological conditions of the territory of the location of local sources of oil pollution within the Republic of Uzbekistan

Geomorphological area	Lithological structure of the active water exchange zone	The difference between the levels of groundwater and pressure water	The prevailing direction of filtering	Type of groundwater flow, speed, m/day	Underground outflow, mm / year	Depth of occurrence of the level of ground water,	Dilution capacity of the flow, m/day	Protection of underground waters
I. Geomorphological area	Homogeneous sand-pebble layer	A single aquifer ΔH=0	Horizontal flow	A quick, 100-200	300-500 or more	From 50-100 to 3-5	More than 1000	Not protected
II. The periphery of the cones of the nose, wide river terraces, undifferentiated foothill plains, modern and ancient river deltas, subaerial river deltas, inter-cone depressions	**Double-layer** cover-overlapping, slightly permeable; underlying-homogeneous, well-permeable sediments	ΔH≠0 when the relationship between ground (cover) and pressure (underlying) waters	In the upper layer there is a vertical flow of moisture and salts, in the lower – a horizontal flow	Very slow, up to 25	150 or less	1-3	Low 100	High
III. Upper river terraces and similar areas of low-lying foothill plains	**Two-layer** thick layer of sandy loam-loamy sediments, underlain by well-permeable	ΔH≠0 weak relationship of ground (cover) and pressure (underlying) waters			150-300	10-15	100-1000	Average
IV. The lower alluvial terraces	**Two-layer** shallow-earth cover of low thickness is underlain by well-permeable sediments	A single aquifer ΔH=0				1-5	>1000	Low

section is slow. The depth of penetration depends on the time of operation of the object, the total volume of leaks and the composition of petroleum products. Thus, heavy viscous petroleum products (fuel oil, crude oil) accumulate in the upper part of the aeration zone or on the ground surface and in the soil, light petroleum products are filtered further and can eventually reach the ground water level. The contamination does not spread horizontally within the aeration zone.

Due to the fact that a significant amount of petroleum products "hangs" in the aeration zone, the degree of soil contamination is high.

With large volumes of liquid petroleum products entering the aeration zone above the ground water level, a relatively large floating lens of light fractions of petroleum products (gasoline, kerosene, diesel fuel) is necessarily formed – a zone of complete oil product saturation of the soil above the water surface. In this situation, this form of accumulation of petroleum products is the core and the main part of the oil pollution of groundwater and soils. A floating lens is characterized by high power and a relatively limited area, since the migration of the lens along the lateral is difficult.

Parallel necessarily formed concomitant accumulation of oil in the aquifer area is dissolved and emulsified oil in groundwater (form, derived from the lower layers of floating elements); in the zone of aeration–drop-membrane cap of petroleum products (form, a derivative of the filtered liquid oil and sewage, and in the lower part of the clusters due to seasonal fluctuations of the surface of the floating elements); in the zone of aeration with access to the surface – gas cap oil (form, basically a derivative of the filtered light hydrocarbons and all forms clusters of the latter).

In the aeration zone, with minor complications of its structure or with the occurrence of a hydrodynamic barrier that prevents the penetration of petroleum products to the depth (due to the residual water saturation of rocks), it is also possible to form small suspended lenses of petroleum products as an independent form. In this situation, when low-mobility fuel oils and oils arrive, a layer of oil-activated soils is formed in the near-surface part of the aeration zone (if there is a soil layer in the latter). The scale of this independent form of accumulation of petroleum products depends on the volume of heavy oil products received.

Due to the weak relationship of ground and underlying pressure water, the penetration of pollution to the depth is difficult.

The degree of environmental hazard depends on the time of operation of the object and the distance to the objects (rivers, water intakes, etc.), the pollution of which can cause negative consequences.

The lower alluvial terraces from the surface are represented by a thin, fine-grained cover, underlain by well-permeable sediments. The high permeability of the rocks of the aeration zone and intensive water exchange create conditions under which a powerful lens of petroleum products is not formed, since the infiltrating petroleum products are quickly "carried" by the groundwater flow outside the site, sometimes for a considerable distance, polluting surface watercourses, reservoirs, etc. At the same time, large areal zones of film spreading of petroleum products are formed in the vicinity.

When the ground water flow is barraged in the plane of its surface by sections of less permeable rocks, film oil products accumulate at the boundaries of these sections in the form of more "powerful" (in comparison with the film) liquid oil formations.

The amount of oil that can accumulate in the zone of aeration depends on the sorption capacity of its constituent rocks, the composition of petroleum products: the heavier the oil and the permeable and more neodnorodnye aeration zone, the more oil it can accumulate.

In the unsaturated zone (above the "film") form: drop-membrane cap oil products are mostly adsorbed and highly mobile in highly permeable soils gas cap oil – like shape, derived in this case from the area of film flow of petroleum products.

The presence of a fine-grained cover in the structure of a highly permeable aeration zone makes it possible for the formation of a layer of soils covered with petroleum products in the event of heavy fuel oil and similar oils hitting the surface, and their transformation.

Thus, the most dangerous part of technogenic hydrocarbon pollution of ground water is the floating lens, which largely determines the further development of other forms of technogenic accumulations of petroleum products in the underground hydrosphere and feeds the hypsometrically located areas of ground water pollution with dissolved, emulsified and heavy hydrocarbons.

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