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Sheet XXXV presents the maximum operating range of the water supply, sewerage, heating, and gas supply networks against the underlay of major streets within the city limits. The range boundaries were established by connecting the most outlying points reached by each network, thus mapping certain areas within the city limits. These areas, however, are not tantamount to the given utility being available there. They also include locations where connection to a network is not feasible due to low demand. The range boundaries of water supply and sewerage networks include the areas already boasting the necessary infrastructure and those into which the infrastructure is planned to be extended. The projected extensions until 2005 are intended to increase the density, rather than the range of the existing infrastructure. These plans may be changed subject to the financial resources available to the city.

The utility infrastructure ranges are shown against the backdrop of the urbanised area. Urbanisation as a progression of urban forms of settlement, is a product of many complex processes, but most of all it is consequential upon migration from rural areas to cities and non-agricultural settlements, expansion of the existing cities, increased employment in non-agricultural sectors, and adoption of an urban life style by the migrants from rural areas. Therefore some areas lying within the administrative boundaries of Łódź are not included on the map as they are not yet urbanised.

The map of the water supply, sewerage, heating distribution, and gas networks indicates the most and the least suitable areas for future development.

The specific historical and socio-economic conditions of Łódź's development have influenced the character of its buildings and their utility retrofit. In the 1920s, Łódź was the only European city with the population of 500,000 that did not have a water supply and sewerage network. The first waterworks and sewage system was designed by W. H. Lindley. With respect to the waterworks, it offered two water supply proposals:

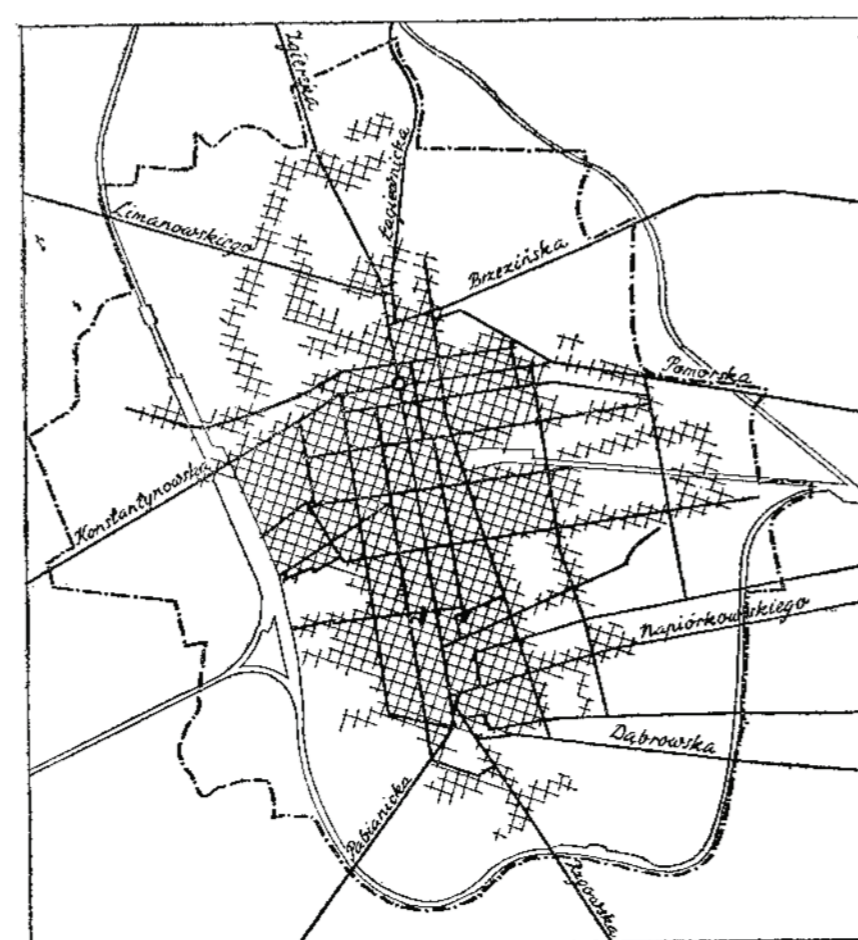
- extraction of deep underground waters via 600–800 m wells from the Lower Cretaceous aquifer in the south eastern part of the city;
- extraction of surface water from the River Pilica near Tomaszów, water treatment on extraction, and transmission through a pipeline to Łódź.


The project was not implemented. Lindley's ideas, however, stood the test of time and were largely adopted in later waterworks designs.

A fundamental utility infrastructure development took place only after the liberation in 1945. The city water supply network, built in the interwar period, was relaunched and at the same time the works commenced with a view to expanding the network and solve the extremely difficult issues of supplying water to Łódź. To this end, the city council undertook a very expensive investment project to transmit water from the River Pilica – 50 km away. The first pipeline was built and commissioned by 1955, and in 1963 the construction of the second pipeline was completed.

Building a sewerage system in a rapidly growing city for years had been an increasingly urgent issue. Although in the 19th century witnessed the construction of open ditches – commonly known as 'gutters' - which conveyed household and industrial liquid waste as well as rainwater into the many natural water courses cutting through the city, they were but a substitute for a sewerage system and did not solve the problem. The building of a sewerage system is strictly correlated with water supply demand. The sewerage system carries away the wastewater produced from nearly all the water supplied by the waterworks. Therefore, the first sewerage system design was developed simultaneously with the waterworks design. It was also developed by engineer W. H. Lindley, who within the then city boundaries designed a transparent network of channels that would basically transmit the sewage to the sewage treatment plant. The project got off the ground on 24 September, 1924, when the Łódź Assembly passed a resolution to build a sewerage network and in the 1925 budget allocated for this purpose a not insubstantial amount of 5 million zloty. On 2 October established was a self-contained Waterworks and Sewerage Department of the City Council, headed by engineer Stefan Skrzywan. The project was launched in April of 1925, when the construction of the channels began.

The beginnings of the gas supply infrastructure in Łódź date back to 1869. The gasworks were built by English capital and then sold off to a German operator. In 1918, the city took over the administration of the gasworks. The production equipment was outdated and worn out, and the production costs were rather high. The efforts to build new production facilities were only effective in 1933. It was then that modern coke ovens were built which remained in service until 1984. Between 1970 and 1984 coke-oven gas was gradually replaced by natural gas.

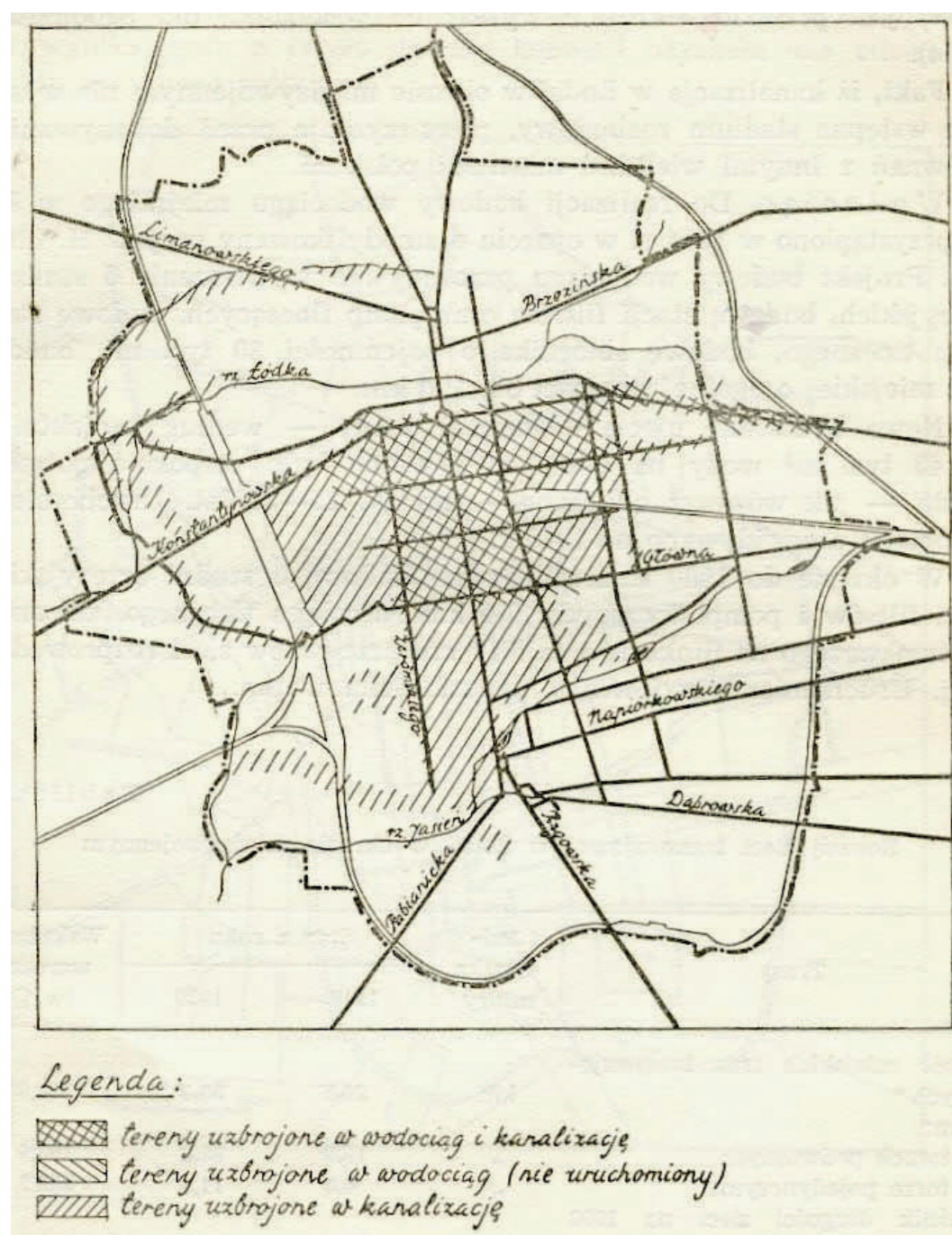





Legenda:
 tereny uzbrojone w gaz

Map legend:
 - Lands fitted with gas network

Literature and sources

- Ginsbert A., 1962, *Łódź Studium monograficzne*.
 Kwiatkowski S., 1973, *550 lat miasta Łodzi*.
 Rosin R., 1988, *Łódź dzieje miasta*.
 Rynkowska A., 1964, *Zarys historyczny rozwoju Łodzi*.



Legenda:
 tereny uzbrojone w wodociąg i kanalizację
 tereny uzbrojone w wodociąg (nie uruchomiony)
 tereny uzbrojone w kanalizację

Map legend:
 - Lands fitted with waterworks and sewers
 - Lands fitted with waterworks (not launched)
 - Lands fitted with waterworks and sewers (not launched)

Fig. 1. Range of sewers and waterworks In Łódź as in 1939.