Dukan-Sulaimany water treatment plant Line/2

This project consist of 4- Stations :-

1. Raw water pump station
2. Water treatment plant station
3. Intermediate pump station No.1
4. Intermediate pump station No.2

Dukan-Sulaimany water treatment plant Line/2

- The design capacity of the project is 1200m3/hr . Each station has (14) vertical turbine pump the capacity of each pump is 1000 m3/hr with different heads .

- The head of raw water pump station is 156m, the water treatment plant head is 230m, and each of the intermediate pump station with a head of 256m.

Dukan-Sulaimany water treatment plant Line/2

- There are two main pipelines used in the project ,the first is (1200mm) carbon steel pipe and the other is (1400mm) GRP pipe .
- These pipe lines start parallely from the first pump station until the intermediate pump station No.2,after that we have just the GRP pipe going to Sulaimanyah city ,and there is a branch with adiameter of (900mm) and a head of (150m) supplies water to these cities:- (Allaie,Bazyan,Tainal,Bainjan,Gopala,Takiya, Shorsh ,Chamchamal)

Dukan-Sulaimany water treatment plant Line/2

- The process of treatment begins by taking raw water through a screen from the river small zab (lower zab) to the raw water pump station tank and by using a (600kw) powered vertical 3-stage pumps the water is pumped to the water treatment plant pump station .

- At the water treatment plant water reaches a Siplitter tank which divides the water into two parts after adding Chemicals (Aluminum solfate , Chlorine and Polymer)

Dukan-Sulaimany water treatment plant Line/2

- Then the water goes to a rapid mixer (one for each part) which mixes the Chemicals perfectly .
- In the rapid mixers the water is divided into 4-parts, each of them supplies water to a Clarifier (it means we have 8 Clarifiers)
- In the Clarifier which consists of two main parts both the sedimentation and flocculation proses are done .
- The sludge is throne out from the Clarifier by gravity after opening valves at the bottom of each part of the Clarifier – to a waste water pipelines.

Dukan-Sulaimany water treatment plant Line/2

- Then the water of each four Clarifiers goes to a (12) Filtering cells department, in the inlet channel of each department chlorine is added which is the second addition after the pre-chlorination at the siplitter.
- Each filter cell has an area of (50)m2 , the filtering media consists of two materials (30% Sand , 70% anthracite) consisting a (1) meter filtering media .
- The water after passing the filtering media goes through fine grooved nozzles to a main collecting pipe to a back wash water tank.
- Each filter needs to be back washed according to different parameters {Turbidity , Level of the filter water above media and the filtered water flow rate}

Dukan-Sulaimany water treatment plant Line/2

- The back wash process begins by lowering the water level of the cell and by using a high mass flow rate blowers air is blowe through the nozzels from the bottom for about two minutes making the dirt particals to move and separated from the filtering media.

- The second stage of back-wash process is bigin immediately after the blowers stop by pumping water by a low-rate pumps installed on the back-wash tank (700m3/hr) of water is used for about 5 minutes.

Dukan-Sulaimany water treatment plant Line/2

- The third stage of back-wash process begins by using a high-rate pumps (1200 m3/hr) for about 8 minutes .
- The back-wash water goes out of the project through the same waste water pipelines used for the clarifiers .
- This processes are achived by using actuated valves and instruments and it can be done manually or automatically
- Turbidity meters are used to measure the turbidity of each cell installed on the outlet of each filter cell continuously reading the valves .

Dukan-Sulaimany water treatment plant Line/2

- From the back-wash pump tank the clear water goes to the main pumping station tank where the last amount of chlorine is added to be sure that the water produced contains at least (0.5 ppm) of chlorine when it reaches the customers after (60-120)km pipelines .
- This is a short discription of Dukan-Sulaimany water project Line Two .

Many thanks …….

Dukan-Sulaimany water treatment plant Line/2

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