

Setting of co-relation in Hydro-geology in Sabarmati Basin, Gujarat, India.

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Abstract— Work is now geological, geochemical, hydrological, biological, for the design and management of artificial recharge systems, including engineering aspects that could be helpful, when you give an idea of the hydro geological details of the aquifers that can spread the realization up was carried out. A soil and underground structure is due essentially heterogeneous. When I first fatal flaws and to test the general possibilities and be able to design and build the entire system and proceed to the next pilot and small scale systems. This approach is particularly effective in a normal scale effect is important large-scale systems.

Keywords—Aquifer, Ground water modelling, Rockworks

I. Introduction

Water and nutrient balance accurate assessment of large-scale wetland systems need a conjunctive modeling of groundwater flow and water flow in the main aquifer of the marsh surface. The interaction between the two water masses are distinguished gradient and / or the concentration distribution of the contaminants, biological population, chemical, flow, mixing characteristics, the oxidation-reduction potential, dissolved oxygen, resulting in the conversion of organic matter, and thermal properties. Although the concentration distribution of the prediction challenging contaminants in the contaminated area, including treatment alternatives is necessary to evaluate the human health and environmental hazards. Today, many countries are facing major problems, use urban center, how to expand the traditional agricultural sector to manage the increased competition for water, and the stream of water is determined by the environment and wildlife habitat issues. Possible facing views and large-scale water projects in the water highly competitive in the growing difficulty of construction, water users must rely on better management of existing businesses through the conjunctive, including the use of integrated watershed broader strategy of surface and groundwater RESOURCES.

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II. Objectives

These are project objectives may be seen as technology developed at the end of the research. Your basic objective is to define the multi-aquifer system in Dharoi canal command area for setting up correlation-ships between wet lands and depleting water bearing strata to formulate strategies for artificial recharge and conjunctive use of groundwater, using numerical groundwater modeling technique.

III. Methods of Analysis

I. Methology

For setting out the contour and Graph: Surfer and Grapher software will use.

A. *Surfer*

- Surfer is a full-featured 3D visualization, contour and surface modelling package that runs on Microsoft Windows. Surfers, the volume measurement readings, terrain modeling, depth modeling, landscape visualization, surface analysis, contour maps, and 3D surface mapping watersheds are used extensively, contour and 3D surface plots that run on many more. Surfer 9 for Microsoft Windows The program window. Surfer 9 to quickly and easily transform data into outstanding contour maps and surface plots. And with all the options available in Surfer 9, you can do exactly what you customize the map in order to produce the desired presentation. To produce publication quality maps of surfers, quickly and easily, and never more dramatically satisfying.

B *Grapher*

- Gauge Package graph is the ultimate technology available. This easy to use, powerful and dynamic program will help you create professional quality publication quality graphs in minutes! Wow the audience every time you see one of your graphs. Create 60 or more unique graph types. 2D or 3D linear or logarithmic line, distribution, functions, class balancing, bubble, bar chart, create a floating bar chart graph. Create line, bar, rose, wind, radar polar plot. 2D and 3D vector to generate the plot. To create a line, dispersing, or foam circle diagram. High-low-close or display the candlestick plot professional. Histograms, box-whisker creates statistics and graphs, including pie charts, Q-Q plots.

C Rockworks

- Rockwork is a great tool for geotechnical and civil engineers to use in evaluating the construction and excavation sites. You begin, or whether it ends the stage in the middle of a project, you could see that Rockworks can save time and money for you and your customers.

IV. Study area

A Location:

- Latitude below 20° 00' and 24° 42' North 68° 08' hardness falling Research Area "and 74° 48' East is Mehsana, Visnagar, Vadnagar, located in Mehsana district of Gujarat state covers part of the Kheralu and Unjha talukas. Dense canal network in the command area is the agricultural plain terrain, sometimes more or less at the height of 92.96 m above sea level, atop a hill area. The contour of the surface level is displayed on the main river Pushpawati Rupen River drainage; Flow is evident when intense rainfall.

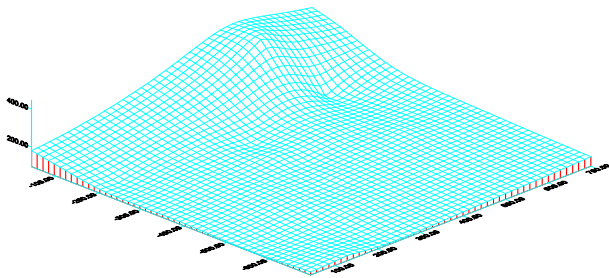


Fig.1: Surface level contours depicting the topography of the area

Following multi-aquifer domain is proposed to be analyzed, which would require a model area with Sabarmati River in the eastern boundary, WR railway line passing through Bhandu in the western boundary, Saraswati River in the northern extreme and the southern boundary would be extreme boundary for Mehsana and Vijapur talukas.

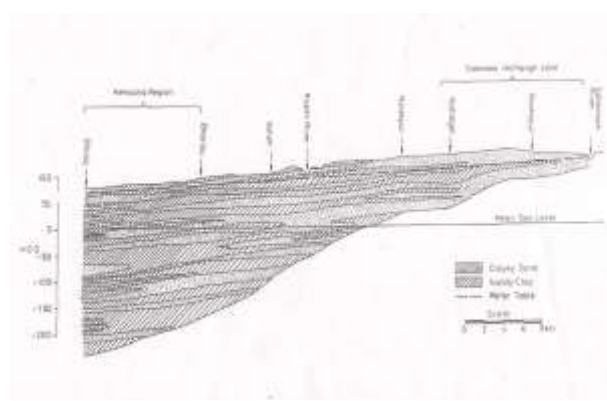


Fig: 2 Model area domains

B Model area:

A water Table aquifer area of 65.7 kmX65.4 km is considered for groundwater flow modelling. The area is selected so as to encompass the Dharoi dam and its agricultural command irrigated by the right bank canal system comprised of main canal, extended main canal, 5 branch canals, distributaries and minors. Observation well locations shown in Fig. 4 indicate that information is suitably available for an area surrounded by right bank canal in north, Vadnagar branch canal on east, Pushpawati River in west and command boundary on the southern side. Therefore analysis is concentrated on such area having better data availability, rest of the model area is included for future expansion and keeping the model results free from boundary effects. The conceptual model covers mainly the information about Visnagar and Vadnagar regions; hence present thesis would spell much about these regions.

+ :-well
 :-distributaries

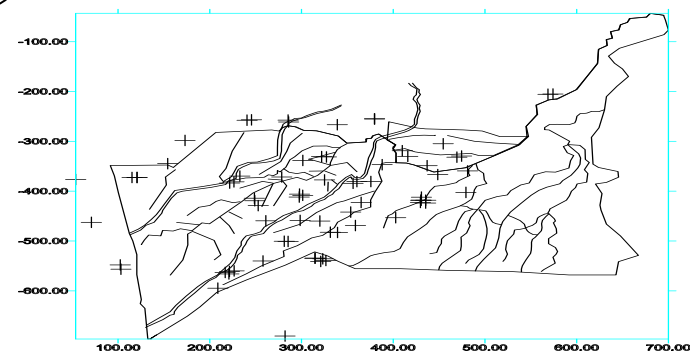


Fig 3 Model Area co-ordinated between (43,-697) to (700,-43)

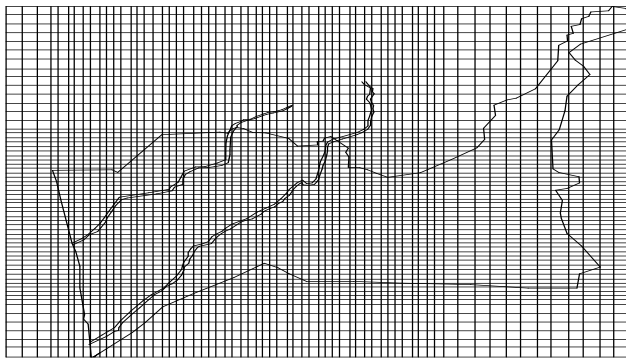


Fig 4 Model area surrounding by right bank canal

V. Lithologic modeling of dharoi region using rockworks

A Summary:

- Three-dimensional modeling technique has been used in more rock characterization and modeling of groundwater flow Dharoi city of Gujarat state fraud aquifer system of the Indian subcontinent. Then the data using Rockworks rock model was constructed to log in. Ground water flow is facilitated by the MODFLOW model was built using the results of the rock model. The obtained model is a complex sedimentary rocks are of course configure the system to log data honored mainly rock six categories, revealed: clay, clay, sand, fine sand, coarse sand, sand, gravel, gravel. It tends to be sandy layer connection. For the hydraulic continuity between this study and the fingering is displayed as part of the Dharoi Sabarmati river basin sub-basin of the connection of the sand aquifer materials within the selected system. Area. Dharoi sub-basin study area is designated as a line in the Sabarmati River Basin map. Top Sub-basin and watershed area covering up major rivers of Dharoi dam is designated as Dharoi sub-basin. Dharoi dam was built in 1978 in Ahmedabad Mehsana district is located approximately 165km upstream to the village Dharoi. It covers an area of drainage to the main river of the Dharoi dam.

B Lithologic modeling of Quaternary aquifer system

- Research for the study area as an underground rock log indicates that the local clay, clay, sand, fine sand, coarse sand, sand, gravel, gravel consists of six categories. Sedimentary sequences that occur in the study area revealed the complexity of the sedimentary basins and aquifer heterogeneity of the system on morale. Direct correlation between the log as a 3D representation of the rock log shows that it can be obtained from a conventional two-dimensional representation. Therefore, the true three-dimensional reading method used in this research was provided by Rockworks software package was used for

"Solid Modeling" concept based on rock modeling techniques. "Box" irregular interval data by interpolating the measured value of types. Lithologic modeling of underground rock formations of well logs indicate that the zone is composed of six categories for localized areas of research fraud investigation aquifer system regular intervals node generates clay, clay, sand, fine sand, coarse sand, sand, gravel, pebbles from. Sedimentary sequences that occur in the study area revealed the complexity of the sedimentary basins and aquifer heterogeneity of the system on morale. Direct correlation between the log as a 3D representation of the rock log shows that it can be obtained from a conventional two-dimensional representation. Therefore, the true reading three-dimensional way in the present study are available in the software package used was Rockworks based on the concept of "solid modeling" method was used for modeling the rock. "Box" is regularly made by every node from irregular interval data by interpolating the measurements of rock types.



Fig 5. Location of bore well on Google map

C Aquifer sections

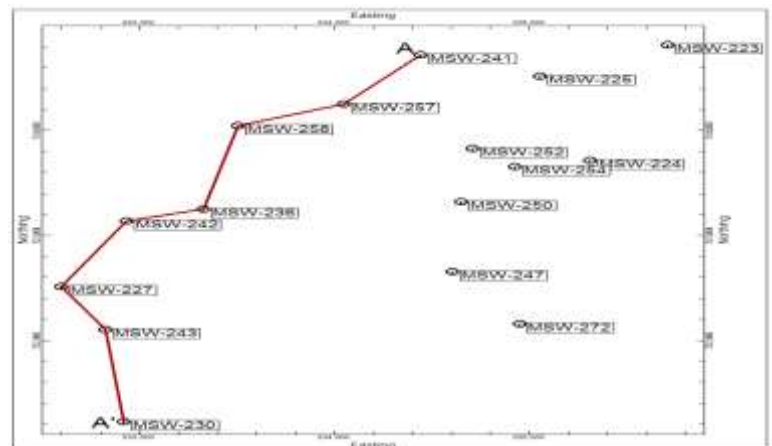


Fig 6 Location of wells for Aquifer section A A'

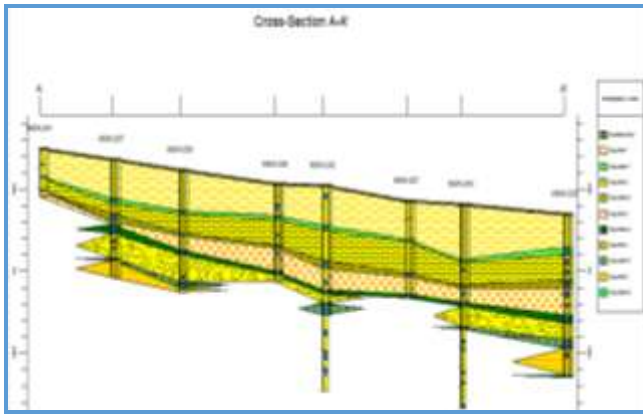


Fig 7 Auifer section A A’

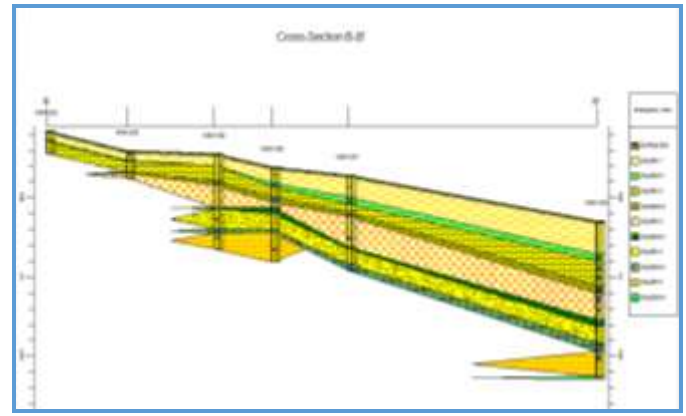


Fig 10 Auifer section B B’

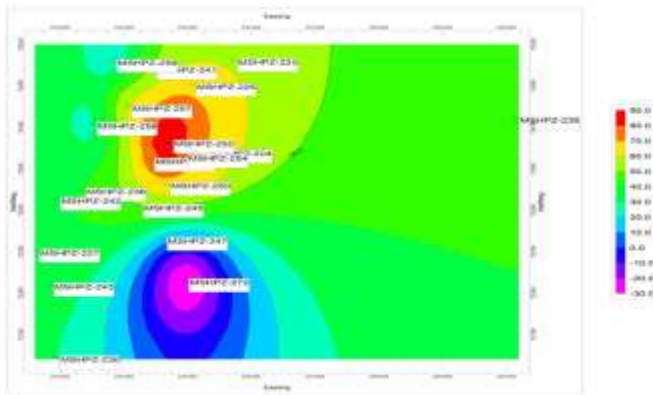


Fig8 Aquifer contour map

A

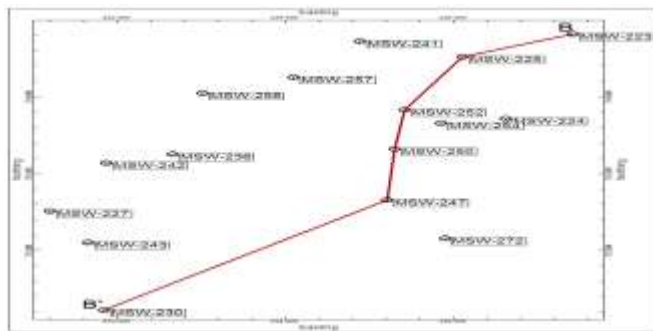


Fig 9 Auifer section B B’

VI. Results and conclusion

- The works carried out till now give the idea of hydro-geological detail of the aquifer to propagate realizations, which could help for Design and management of artificial recharge systems involving geological, geochemical, hydrological, biological, and engineering aspects. Because soils and underground formations are inherently heterogeneous. I am first testing for fatal flaws and general feasibility and then proceeding with pilot and small-scale systems until the complete system can be designed and constructed. This approach is especially valid for large systems, where scale effects are usually very significant.

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