

## The distribution of the flowing artesian well and the change of flowing artesian well area in the Ashigara Plain.

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### Introduction

Many of cities are located in the alluvial plain of an area along the shore for our country which is an island country. In the alluvial plain, the confined groundwater cultivated in an upside fan or mountain area is used as the source of industrial water, or a source of tap water with river water. Overuse of groundwater in the city region in period of high economic growth caused groundwater obstacles, such as ground subsidence as one of the seven typical pollution and depleted of springwater.

Also in the flowing artesian well area from which is distributed in the Ashigara plain in the western area of Kanagawa prefecture decline has been reported after the 1960s. However, about neither the number of the flowing artesian wells which will be estimated if there are 1,000 or more points in the whole Ashigara plain, nor the actual conditions, such as the amount of natural flows, it is fully solved yet. In this study, exhaustive survey was performed about the flowing artesian well distributed in the Ashigara plain in the western area of Kanagawa prefecture, and distribution of the flowing well area and its secular variation were clarified.

### Results of an investigation and consideration

Investigation of the flowing well was conducted in the 2011 to 2012. In the investigation in the 2011, about distribution, the amount of flowing water from the flowing artesian well, and main dissolved components of the flowing well, the flowing artesian well of 1,096 wells was investigated and estimation of the amount of springwater from the flowing artesian well in the whole Ashigara plain, specification of the range of a flowing well, etc. were performed. Moreover, in the investigation in the 2012, one investigation was conducted for the flowing artesian well of 200 wells every month, and seasonal variation of the amount of natural flows was clarified.

1,096 flowing wells were investigated in the investigation in 2011. The well which was carrying out the natural flow among the investigated flowing wells were 749 wells. Moreover, the amount of natural flows was measured by 648 wells, and the amount of sum total natural flows was 26,738 m<sup>3</sup> / day (9,760,000 tons / year). On the other hand, since the flowing well it became impossible that is investigated by this investigation checked 687 wells in the region, the amount of natural flows which gushes from the flowing well in the Ashigara plain was estimated at 50,262 m<sup>3</sup>/day (18,350,000 tons / year). This amount of natural flows was equivalent to 25% of the amount of sum totals of the amount of groundwater withdrawals of the whole plain and the amount of natural flows in 2003.

Moreover, the area of the flowing artesian well in the Ashigara plain was 13.49km<sup>2</sup>. As for the area of the flowing artesian well region in the Ashigara plain, past five investigations were conducted. The area of the region was 18.79km<sup>2</sup> in 1961. And these results of an investigation were about 70 percent of the area in 1961. The area of the flowing artesian well region showed the downward tendency till the 1980s, and was changing at around 13 km<sup>2</sup> in general after the 1990s. This changing trend was similar with the long-term variable trend of the groundwater level in the upper area of Ashigara plain, and a possibility that a quantitative relation between change of the flowing artesian well region and the groundwater level of the upper arewa of Ashigara plain located in the cultivation region of flowing well groundwater was suggested.

Keywords: flowing artesian well, Ashigara Plain, change of the flowing artesian well region