CENTRAL GROUND WATER BOARD
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVINATION
GOVERNMENT OF INDIA

GROUND WATER YEAR BOOK
PUNJAB AND CHANDIGARH (UT)
2014-2015

North Western Region
Chandigarh
September 2015

FOREWORD

Central Ground Water Board, the National Apex Organization is regularly monitoring ground water levels and ground water quality since 1968. These are most important aspects to depict the spatial and temporal variation of ground water regime. The changes in water levels and quality are attributed to the development patterns of ground water resources for irrigation and drinking water needs. Analyses of water level fluctuations are aimed at observing seasonal, annual, and decadal variations. Therefore, the accurate monitoring of the ground water levels and its quality, both in space and time, are the main pre-requisites for assessment, scientific development and planning of this vital resource.

Central Ground Water Board, North Western Region, Chandigarh has established numerous Ground Water Observation Wells in Punjab State and in Chandigarh (UT) for monitoring the water levels. During 2014–2015, a total 755 observation wells (169 dug wells and 614 piezometers) have been monitored in Punjab and 17 observation wells (1 dug wells and 16 Piezometers) in Chandigarh in phreatic aquifer. Deeper aquifers are also being monitored by way of 38 piezometers in Punjab and 7 piezometers in Chandigarh. In order to strengthen the ground water monitoring in Punjab state, additional ground water observation wells were established. As on 31.03.2015, there were 913 Ground Water Observation Wells which included 169 dug wells and 706 piezometers for monitoring phreatic aquifers and 38 piezometers for monitoring deeper aquifers in Punjab. This report presents the observations and findings for the period May 2014 to January 2015.

Shri M. L. Angurala, Scientist 'D' has put concerted efforts to compile and analyse the data and prepare the report in its present form. Chapter on Chemical Quality of ground water has been compiled by Mrs. Balinder. P. Singh, Scientist 'D' and Sh Rishi Raj, Asstt Chemist.

I sincerely hope that this report presenting various analysis and data on ground water level behaviour and quality will be of immense use to the user agencies and other stakeholders.

(Dr. S. K. Jain)
Regional Director

Ground Water Year Book
Punjab State and Chandigarh (UT)
2014-2015

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GROUND WATER YEAR BOOK
PUNJAB STATE AND CHANDIGARH (UT)
(2014– 2015)

1.0 INTRODUCTION

The Punjab State is located between North latitudes 29° 32' and 32° 28' and East longitudes 73 ° 50' and 77 ° 00'. The total geographical area of the state is 50362 sq. km. It is surrounded by the states of Himachal Pradesh in the northeast, Jammu and Kashmir in the north and Haryana and Rajasthan in the south and southwest respectively.

The State has a flat alluvial plain except a narrow belt along the southwestern parts where stable sand dunes are seen dotting the landscape. The area occupied by the mountains (Himalayan foothills) in northeast, is about 1243 sq km. Perennial Rivers Sutlej, Beas, Ravi and ephemeral river Ghaggar drain the state. It has a vast network of canal system. With the inception of canals, the fertile land of the State started converting into green fields and experienced spectacular achievement in agricultural production with emphasis on cultivation of paddy and high yielding varieties of crops, as a consequence demand for water increased manifold resulting in over exploitation of ground water resources.

The State has been divided into four main divisions viz. Jalandhar, Patiala, Ferozpur and Faridkot, which are further sub-divided into 22 districts, which are further divided into 77 sub-divisions /tehsils, 76 Sub- tehsils and 146 community development blocks.

1.1 Physiogarphy

The State forms a part of vast Indo-Gangetic alluvial plain. Physiographically, the State can be divided into seven distinct units, which run parallel to each other.

i Hilly area: Siwalik hills on the north and northeastern part .

ii Eroded hills with flat land (Plateau): forms top of hills.

iii Intermontane valleys

iv Piedmont area: (Kandi zone) immediately southwest of hills.

v. Sirowal zone: lies further southwest of kandi area which merges with the alluvium of Ravi, Beas, Sutlej and Ghaggar rivers.

vi. Alluvial plains:

a) Active/recent flood plains include meanders and present flood plains.

b) Abandoned flood plains include terraces of rivers, abandoned during Recent age.

c) Bar upland areas: Higher elevated land which remained beyond the reach of rivers but are composed of ancient river channels deposits (older alluvium) plains.

vii. Sand Dunes: Covering southwest part.

i) **Hilly area :**

The outermost low lying Siwalik hills of the Himalayas occupy the NE part. These are the deposits of the Indus river and comprised of alluvial ,derived from the higher mountains, which were swept down by their numerous rivers systems and part of Siwalik rock formations have been involved in the latest Himalayan tectonic movements by which they have been folded, faulted and elevated into their outermost foothills. These occupy northern and northeastern part of Gurdaspur, Hoshiarpur, Nawanshehar and Ropar (Roopnagar) districts. These hills traverse NW – SE direction and forms the boundary with neighboring State of Himachal Pradesh. In Gurdaspur district, the hills extend from Ravi river on northwest to Beas river on the southeast. In Hoshiarpur and Nawanshehar districts, the hills cover northeast parts and extend from Beas to Satluj rivers. These foot hills separate the main Himalayan ranges form the vast Indo- Gangetic alluvial plains. The hilly region is intersected with numerous streams which remain dry during major part of the year except during rainy season when these carry flood water. The highest peak in the area is 900 m above M.S.L. The hills present uneven topography and at places are highly eroded. The gradient is varying in the hilly areas.

ii) **Eroded hills with flat land**:

These areas lie within Upper Siwalik formations and locally known as `Beet' meaning waterless. The flat surface lands (plate or table lands) occur in Hoshiarpur district and these are fertile land composed of sandy clay and support irrigational activities.

iii) **Intermontane valleys:**

Intermountain Satluj valleys extend from Nangal to Roper along the Satluj river. It is a longitudinal valley and about 40 Km. in length having an average width of 5 Km. High land river terraces are seem on the north east and eastern part of the area which have been deeply eroded and furrowed to form " bad land" topography. The thickness of valley fill is very limited and here an average of 50 m below ground level. Another valley known as " Soan nadi valley " is an intermontane valley in the outer Himalayas extending from Daulatpur in Himachal Preadesh to Hajipur (Punjab). It runs in southeast-northwest direction and follows the general strike direction of the mountain ranges. It has a length of 20 Km and width ranges between 1.5

km to 3 km and in Punjab State . This valley portion extend along the left bank of Soan nadi and along its right bank, Siwalik hills are exposed.

iv) **Piedmont areas:**

The transitional area between the alluvial plains and mountainous range of the Himalayan foot hills forms the Piedmont area shown in Plate-1.2. These consist of alluvial fans which have been dissected by hill torrents and small perennial streams, much of the detrital material has been reworked separately by sheet flooding. The lower southeast slopes of the piedmont forms 'Sirowal zone'. In Punjab State, piedmont area is know as " Kandi", and occupy Southwest part of lower Siwalik hills. The gradient is steeper near the hills and gentler towards plains. The width of 'Kandi belt' varies from 6-10 km. having rolling type of the topography. In Gurdaspur district, the spring line runs parallel to the southwestern boundary with 'Sirowal zone'. But in Hoshiarpur, and Ropar districts , the spring line (auto flow) do not exist hence boundary between kandi and Sirowal could not be precisely demarcated.

v) **Sirowal Zone:**

It lies further southwest of Kandi belt. The topographic gradient is gentler as compared to kandi and presents very low relief. In Gurdaspur district, the Sirowal zones occupy immediately SW of spring line and have an undulating topography.

vi) **Alluvial Plains:**

These forms a dominant physiographic unit and consist of alluvium of the Indus river with its present and ancestral tributaries. The alluvium was deposited by Ravi, Satluj, Beas and Ghaggar rivers. The plains have altitude of less than 300 m above M.S.L. The master slope is towards southwest and matches with the course of the rivers. The alluvial plains have been further divided into three sub-physiographic units based on the present relationship of the surface features to the rivers. These are as follows:

- Recent Flood Plains
- Abandoned Flood Plains
- Bar Upland Areas

Recent Flood Plains: These include the meandering zone and present flood plains of the rivers. The meanders, scars, sandbars, natural levees and back water swamps are the conspicuous features of the flood plains. Along the major rivers, there are low flood plains

locally called ‘Bet’. The recent flood plains are often separated from the upland plains by steep slopes. The water levels are shallow in ‘Bet’ area.

Abandoned Flood Plains: These are parallel to the rivers and are a few meters higher than the recent flood plains. They represent flood plains that have been abandoned in recent times by the major rivers.

Bar Uplands: These are large areas of relatively older alluvium and found in the Upper Bari Doab area and are elevated lands above the bordering flood plains. These remain beyond the reach of flood waters of the present river systems and are termed as “ Bar Uplands” These are the most significant physiographic features of the alluvial plain. Typically, the bar uplands rise abruptly from the abandoned flood plains and are bordered by steep scarps. In Gurdaspur district, Bar upland areas are characterised by undulating topography, dendritic drainage pattern and predominance of nodular “kankar”.

vii) **Sand Dunes:**

These occupy southwestern part of the state which experiences semiarid type of climate and constitute about 28% of the area. These are spread over about 10-15 percent of the area and cover parts of Firozepur, Mansa, Bathinda, Muktsar, Kapurthala, Sangrur, Faridkot and Patiala districts. The area is bounded by $29^{o}33'$ and $30^{o}36'$ north latitudes and $74^{o}18'$ & $76^{o}12'$ east longitudes. These dunes are mostly isolated type and vary in size and height. The sand dunes form a thin layer over the alluvium.

1.2 Drainage:

The Ravi, Beas, Satluj and Ghaggar rivers along with West and East Beins and the non-perennial choes and Khads drain the Punjab State. The Ravi flows along the northwestern boundary and forms the international boundary with the Pakistan. The Satluj forms the international boundary with Pakistan in the south-western part of the State. Ghaggar river flows along the southeast boundary of the State and forms the boundary with Haryana State except at a few places where villages of Punjab lies on the left bank of Ghaggar river and Haryana villages occupy right bank of the river. All rivers flow in the southwest direction expect the Satluj river which roughly flow from east to west up to Harike and from Harike it assumes southwesterly trend upto Fazilka. The Satluj and Beas rivers have been damed by construction of Bhakra dam and Pong dam respectively. After the Construction of Ropar headworks barrage, the Satluj river has water only during the rainy season on downstream of Ropar. At

Harike Pattan, it carries the flow regenerated by ground water effluent seepages. Soan nadi originates near Daulatpur (H.P) and all the choes from the Western slopes of Chint Purni range (H.P.) flow into it. The Soan nadi joins the Satluj near village Bhalan. All the rivers rise from Himalayas and after traversing long courses, they debouch into the plains. Apart from the perennial rivers, there are other important seasonal streams, choes and drains. The sub-montainous zone is traversed by a number of choes. Some of them contribute to the rivers while other terminate without merging into any river. These 'choes' remains dry for most part of the year. Their discharge is irregular and runoff during the monsoon period.

In Upper Bari Doab tract, Chakki Khad a perennial tributary of the Beas drains mainly the 'kandi' belt. The Naumuni and Kiran are two tributaries of the Ravi and drain north western parts of this tract. The Patti nala drains the southwestern part of the area and joins the Satluj River. The Kiran nadi originates in north of village Isarampur in the close vicinity of Keshopur Chhamb. It is fed by ground water seepage and the excess water of Upper Bari Doab canal is also diverted into it. In addition to these tributaries, there are several khads traversing 'Kandi' belt which remain dry except during rainy season. Some of the major Khads like 'Pungotri Khad' traverse even beyond the spring line. Such Khads gain water through ground water effluent seepage. The Bist Doab tract is traversed by about 85 hill torrents known as choes, which debouch into plains. There are two main drainage patterns in this tract and both are perennial.

i) Eastern or White Bein .

ii) The Western or Black Bein.

The eastern or White Bein originates near Garshankar village of Hoshiarpur district and joins Satluj river near Lohian after traversing the Bist Doab tract. The Nasrala, Mehlan wali, Rajni devi, Mehandpur, Jaijon choes join the east Bein at different places. The Western or Black Bein rises at Chhamb near Dasuya in Hoshiarpur district and joins the Beas river near Durgapur which is located upstream of its confluence with Satluj at Harike. Janauri, Mehngerwala and Kingranwala join the West Bein. In Ropar district Budki Nadi, Haripur nala, Sugh Rao, Siswan Nadi, Jainti Devi Ki Rao and Patiali Ki Rao forms the major drainage system. These all meets Satluj river except Patiali Ki Rao and Jainti Devi Ki Rao which gives water to Ghaggar River. The third zone forming the southeastern part of the State is drained by Ghaggar river which is perennial. Tangri nadi, Budha nala and Lissara nala are the main

seasonal streams in the area. In south western part, some of the important drains are the Phidda drain, Chand Bhanja drain and Jallalabad drain etc.

1.3 Soils

The soils of Punjab have largely developed on alluvium- the material laid by the rivers, under the dominant influence of climate followed by topography and time. The details of the soils found in the state are as follows.

Reddish Chestnut Soils:

These soils occur on stable terraces in the north and north eastern Parts of the state and are found in Pathankot tehsil of Gurdaspur district, parts of Hoshiarpur, Dasua and Garh shankar Tehsil of Hoshiarpur district, Balachaur Tehsil of Nawashahar district and Ropar, Anandpur Sahib and Kharar Tehsils of Ropar district. These soils are loamy to clay –loamy in nature and are decalcified. Erosion of of soils due to water is a very serious problem. The soils are mildly acidic to neutral in reaction. These soils are found in areas having normal rainfall of 800 to 1000mm.

Tropical Arid Brown Soils (Weakly Solonised):

These soils are found in remaining areas of Gurdaspur, Hoshiarpur, Nawashahar and Ropar districts and most parts of Jalandhar, Kapurthala, Patiala, and whole of Ludhiana , Fatehgarh Sahib districts and in parts of Amritsar and Sangrur districts. These soils are found in areas having normal annual rainfall of 750 to 1000mm.

Arid Brown Soils, (Solonised):

These soils are found in lower parts of Amritsar, Kapurthala ,Jalandhar,Patiala, Sangrur,Ferozepur districts and entire Moga district where the normal rainfall varies from 500 to 700mm. Salinity and alkalinity are the serious problem in these soils. These soils are calcareous in nature and in most cases Kankar layer occurs at 1.0 to 1.5m depth.

Sierozem Soils:

These soils are found in Bathinda, Faridkot, Ferozpur, Mansa and Muktsar districts, where normal rainfall varies 300 500mm. Salinity and alkalinity are the serious problems particularly in the canal irrigated areas. Wind erosion is also a common feature in this soil . These soils are calcareous in nature and usually have a massive Kankar layer at a depth of 0.75 to 1.25m.

Desert Soils:

These soils are found in southern parts of Ferozpur and Muktsar districts where the normal annual rain fall is less than 300mm. Wind erosion is a serious problem here.

2.0 GENERAL GEOLOGY

The great Indo-Gangetic plain with an area of about 8,50,00 sq. km lies between the Peninsular India and the Himalayas. On the basis of seismic and borehole data, Rao (1973) divided the Indo-Gangetic Plain into five parts, which from west to east are (i) The Indus Basin in Pakistan, (ii) the Punjab Basin in Punjab and Haryana, (iii) The Ganga Basin in Uttar Pradesh and Bihar , (iv) The Brahamputra Basin in Assam, and (v) The Ganga- Brahamputra Basin in West Bengal and Bangladesh. These basins have been delineated on the basis of subsurface ridges or high. A brief review of the subsurface features of the Punjab Basin of which the Punjab State forms a part, is presented below. In the Punjab Basin the Quaternary alluvium has been deposited at places on semi-consolidated Tertiary rocks (Siwalik Group) or on a basement of metamorphic and igneous rocks of Precambrian age. The alluvial sediments were laid down by the rivers since Pleistocene in the “fore deep” or a down warp formed in front of the rising Himalayan ranges and thus represents the younger geological formation.

2.1 Geological Set Up

The rock formations ranging in age from middle Miocene to Recent are exposed. They are represented by Siwaliks and Alluvium deposits. The Siwaliks (Middle Miocene to Pleistocene) form hilly tract running in northern and northeastern part of the State. The alluvium deposits (Pleistocene to Recent) constitute the plains of Punjab. The Siwaliks are divided into three lower, middle and upper on the basis of lithology and vertebrate fossils. The Siwalik formations have been folded and faulted due to tectonic activities. The various stratigraphical units exposed in the state are given in table as under:

2.1.1 Aeolian Sand (Wind Blown Sand)

These are medium to fine grained and buff coloured sand. They occur in the form of dunes, which are formed as the disintegrated product of the older rocks and found in the southwestern part of the State. The dunes are elongated in shape and are blown sand forming fixed dunes and sandy flats. The dunes are oriented in N-S direction forms ridges which rise from a meter to about ten meters above the surrounding land surface. These sands are

brought from the Rajasthan desert and ultimately deposited and shaped by the southwesterly winds which blow across the area from April to June. Generally, the sand dunes contain loose and unconsolidated sand and at places where vegetation has come up these have been fixed. The sand grains are generally well rounded in shape and mainly consist of quartz and ferromagnesian minerals with flakes of mica.

2.1.2 Alluvium

The greater part of Punjab is occupied by alluvial plains, which are very fertile. The Quaternary alluvial sediments were deposited on semi-consolidated Tertiary rocks and conceals underneath the fringes of Peninsular and extra- Peninsular rocks. Out of the total area of 50362 Sq Km. of the State, alluvial cover about 38500 sq.km. spreading over about 76% of the area. This vast expanse of plains is constituted by fluvial sediments of Indus river system. Beneath thick alluvium cover, there are southwestern extensions of Siwalik, which are exposed only in northeastern hilly tract of the State. The Siwalik rocks are expected to extend Bathinda which in fact separates the northeastern Punjab basin form Southwestern Rajasthan basin. Based on O.N.G.C. data, the contact between the plains and the Siwalik hills is believed to be normal in Gurdaspur district and is faulted in Hoshiarpur and Ropar district areas.

The thickness of alluvium varies from place to places due to irregularities and undulations .The maximum thickness of 4500 m has been reported near Dasuya in

Hoshiarpur district. The thickness of alluvium increases towards northeast. It is comparatively less in the southwestern parts where the rocks of Pre- Cambrian age occur as burried ridges. In the intermontane valleys in north east part, the valley fill is estimated to be around 200 m thick underlain by rocks of Siwalik system. The alluvium comprising sand, gravel and clay is deposited by the Indus river system. In accordance with their mode of deposition by large constantly shifting river, the alluvial deposits are heterogeneous in nature and individual strata have limited horizontal and vertical continuity. The alluvial complex of Pleistocene and Recent age represents the latest phase of sedimentation. It consists principally of fine to medium sand, silt and clay. Beds of gravel and coarse sand are uncommon. It is also associated with fine grained strata, concretionary zones or nodules of kankar. The sand gravel or sand bodies embodied in the clay- silt mixture in the alluvial deposits are usually either small or big lensoid bodies with longitudinal part either normal or nearly normal to the Himalayan and Siwalik strike i.e. NW-SE. Sheet like bodies of sand, sand and gravel had been deposited in the central part

of the State and are regionally extensive. In southwestern and southern parts of the State, ground water is brackish to saline. The rivers have deposited their coarser material in higher reaches, so the flood plain deposits developed in southwestern parts were richer in finer sediments. The alluvium is normally divided in two groups viz :

i) Newer Alluvium

ii) Older Alluvium

It is not possible to clearly indicate any distinct /demarcation line of separation

Between the two units.

i) Newer Alluvium (Khadar)

It occurs in the active flood plains of present day river courses and is generally confined to the neighborhood of river channels. Along the major rivers in plain areas, there exist low flood plain areas which are locally called khadar of 'bet'. These flood plain are often separated from upland plains by a steep slope of the order of 1m to 2m per km. The Newer alluvium is light coloured and poor in calcareous matter. It consists of coarse gravel near the foot hills and lenticular beds of sand and clay along the old river course and silt and clay in the flatter parts of the river plains. It is of Upper Pleistocene to Recent age. The aquifers comprised of medium to coarse sand and gravel. The clays serve as aquitards. The various aquifers are interconnected. However, the deeper horizons show confined to semi- confined conditions. There is wide variation of the hydraulic conductivity and Transmissivity of the aquifers due to rapid changes in their texture and thickness.

ii) Older Alluvium (Bhangar):

It is confined to the abandoned flood plains and bar upland regions. It consists of sandy clay, clay-silt and fine to medium sand. It consists of pale reddish brown coloured beds of clay. Kankar is found disseminated more or less throughout the beds of sand and clays. The kankar bands are generally more in the older alluvium. At places extensive and massive beds of kankar also exist. It is of middle to Upper Pleistocene in age. Older alluvium forms good ground water reservoir/aquifer.

2.1.3 Upper Siwaliks

These formations are exposed throughout the hilly tract starting right from northwest of Pathankot through Hoshiarpur, Ropar to Chandigarh. They are composed of soft grey medium to coarse-grained sandstones, yellowish brown and brown clays. The sandstones are poorly

lithified, soft and friable. They are brownish grey in colour and contain a large proportion of mica flakes and concretions of clay. They also consist of conglomerates, boulders and pebbles of quartzite and yellowish clays. The conglomerates consist mainly of cobbles and pebbles of quartzites. The pebbles of granite limestone, sandstone and lumps of claystones are also present. The conglomerate beds do not show clear stratification and occur as wedge shaped or lenticular bands. The formations of Upper Siwaliks are prone to easy weathering and there is considerable collection of sand as talus cones. These formations yield good to moderate supplies of water.

2.1.4 Middle Siwaliks

These are exposed in Dhar and Dunera area of Pathankot tehsil of Gurdaspur district, north and northeast of Kiratpur in Ropar district. These are comprised of grey micaceous, medium grained soft sandstones interbedded with red, orange and yellowish (buff coloured) clays. The sandstones occasionally contains pebbles of calcareous clay, shale and quartzite. The Middle Siwaliks are poor in yields of ground water due to poor permeability.

2.1.5 Lower Siwaliks

These are exposed in Dhar and Dunera area of Pathankot tehsil of Gurdaspur district, constitute massive grey to light grey, micaceous sandstones interbedded with dark red to maroon clays grading upward in to micaceous sandstone with thick beds of red clays. The rocks of Lower Siwaliks have poor yields of ground water. However small springs of low discharge occur on the hill slopes they confine their position at the bedding contacts where the argillaceous bed is under lain by arenaceous bed.

2.2 Basement Configuration

The Punjab Wedge i.e. the Archaean basement rocks either outcropping or occurring under moderate thickness of alluvium in Lahore- Sargodha area in Pakistan separates the Indus basin in the west, from the Punjab depression in the east. The Punjab depression follows a NW-SE ESE and WNW direction in conformity with the trends of the Siwalik hills. The seismic surveys by the Oil and Natural Gas Commission, (Datta et al., 1964) have indicated that the basement rocks as well as the sediments of the alluvium, dip gently towards the Himalayan foothills. The basement, however, becomes deeper as the foothills are approached with a corresponding increase in the thickness of the sediments. The maximum depth of this depression, about 4500 m was at Dasuya in Punjab State. Furthermore, the Punjab Basin

which is fairly deep and wide in the northwestern portions becomes narrower to the southwest and the basement topography rises gradually in that direction. A basement high occurs in the subsurface corresponding to the present water divide between the rivers of the Punjab and the Yamuna belonging to the Ganga system. According to Rao (1973), it has been long assumed that two ridges extending from Delhi, one to the northwest towards Lahore, and the other to north towards Dehradun are concealed under the alluvium of the plains. These isolated outcrops of Archaean rocks seen at Kirana hills, and Sargodha extending in WNW direction from Lahore has been taken to indicate that a subsurface ridge extends under alluvium from Delhi in India to Lahore in Pakistan About 5km north of Jagadhari (near Ambala in Haryana State), the basement was encountered at a depth of 2800 m and it remains fairly flat at that level till the foothills (Nath, 1964, Rao, 1973). This basement high, often referred to as Delhi-Lahore- Sargodha Buried Ridge based on the inference that it represents the northwesterly extension of the Aravalli Mountain system, trending NW - SE . As shown by the contours , the northwestern flank of the ridge dips steeply and the depth to the bedrock increased sharply in that direction. The contours also indicate that the slopes to the southwest are less steep and the average depth of the bedrock over the crest of the ridge is about 400-500 m. The basement in Punjab basin is known to slope from south to north,and it is rather irregular and must locally contain hills and valleys. The basement seems to have a shape of asymmetrical basin. Both longitudinal and transverse faults are present in the basement, which forms a monocline with gentle northeasterly dip and no major structural feature were noticed. Based on seismic surveys carried out by O.N.G.C. indicated that the thickness of unconsolidated sediments in the southern part of the State is 154 m and near Jalandhar it is about 3000m and increases towards north. Near Dasuya it is about 4500 m, being the maximum. The basement rocks have been encountered in number of boreholes drilled by CGWB.The basin is shallowest in the southern part, in Bathinda district and the bed rock was encountered at a depth of 333 m below ground level at Kumharwala. At 333 m depth hard clay top of Palana series was encountered and 416 m claystone of Nagaur series was encountered during drilling of borehole down to 422 depth m. At Kheliwala, the bed rock comprised of Delhi quartzite was encountered at a depth of 533 m below ground level and the borehole was drilled down to 545 m. The thickness of unconsolidated material is maximum in the northeastern part.

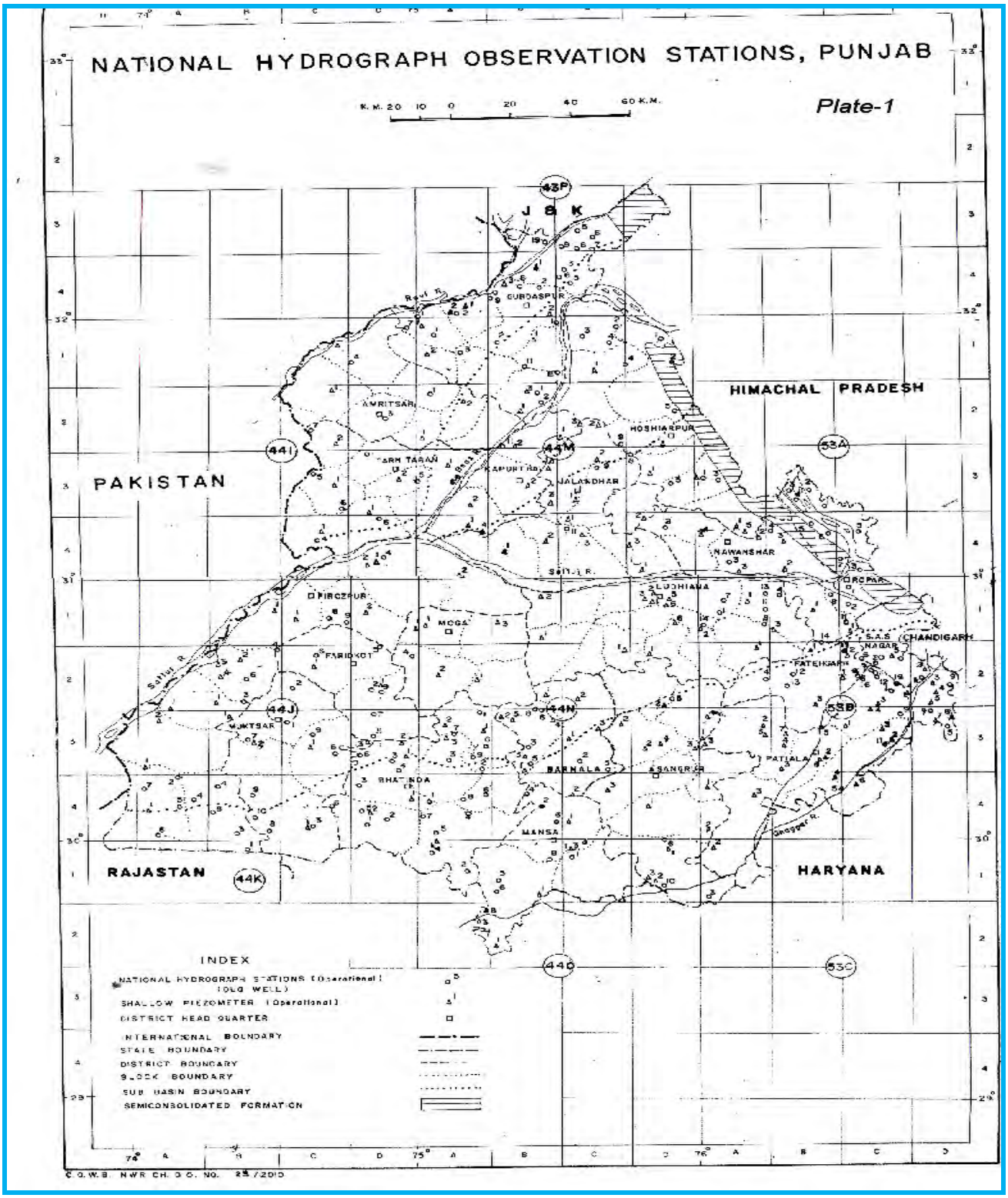
3.0 GROUND WATER REGIME MONITORING

The Central Ground Water Board, North Western Region, has established Ground water observation wells in Punjab State and Union Territory of Chandigarh for monitoring water level. For this purpose, during 2014–2015, 755 observation wells (169 dug wells and 614 piezometers) have been monitored in Punjab and 17 observation wells (1 dug wells and 16 Piezometers) in Chandigarh in phreatic aquifer. Further, in addition to these, deeper aquifers are also being monitored by way of 38 piezometers in Punjab and 7 piezometers in Chandigarh. In order to strengthen the ground water monitoring in Punjab state, additional ground water observation wells were established. As on 31.03.2015, there were 913 Ground Water Observation Wells which included 169 dug wells and 706 piezometers for monitoring phreatic aquifers and 38 piezometers for monitoring deeper aquifers in Punjab. About 80% of the Ground water observation wells fall in the command areas of various canal systems, the areas falling out of the major command is major part of Hoshiarpur and Ropar districts, parts of Gurdaspur, Jalandhar and Ludhiana districts. The district wise details of Ground water observation wells are given in **Table 1** and shown in Plate 1.

Table- 1 District wise ground water observation wells, Punjab State and Chandigarh

S. No.	Districts	No. of Ground water observation wells as on 31.3.2014			No. of Ground water observation wells established during AAP 2014-2015			No. of Ground water observation wells as on 31.3.2015		
		DW	PZ	TOTAL	DW	PZ	TOTAL	DW	PZ	TOTAL
1	Amritsar	6	26	32	0	16	16	6	42	48
2	Bathinda	29	18	47	0	34	34	29	52	81
3	Barnala	0	26	26	0	1	1	0	27	27
4	Faridkot	8	17	25	0	0	0	8	17	25
5	Fatehgarh	5	20	25	0	2	2	5	22	27
6	Fazilka	10	9	19	-1	5	4	9	14	23
7	Ferozpur	7	47	55	1	2	2	8	49	57
8	Gurdaspur	19	41	60	-2	4	2	17	45	62
9	Hoshiarpur	11	34	45	0	16	16	11	50	61
10	Jalandhar	3	38	41	0	32	32	3	70	73
11	Kapurthala	1	37	38	0	8	8	1	45	46
12	Ludhiana	9	33	42	0	3	3	9	36	45
13	Mansa	6	27	33	1	0	1	7	27	34
14	Moga	1	29	30	0	5	5	1	34	35
15	Mohali	10	12	22	1	0	1	11	12	23
16	Muktsar	10	29	39	0	3	3	10	32	42
17	Nawanshahr	3	20	23	0	1	1	3	21	24
18	Pathankot	9	0	9	2	6	8	11	6	17
19	Patiala	3	38	41	0	0	0	3	38	41
20	Ropar	11	24	35	-2	3	1	9	27	36
21	Sangrur	3	32	35	0	2	2	3	34	37
22	Tarn Taran	5	28	33	0	17	17	5	45	50
	Total	169	586	755	0	159	159	169	745	914
1	Chandigarh	1	23	24	0	0	0	1	23	24
	Total Pun jab & Chandigarh	170	609	779	0	159	159	170	768	938

Plate 1: Location of ground water observation wells in Punjab State.

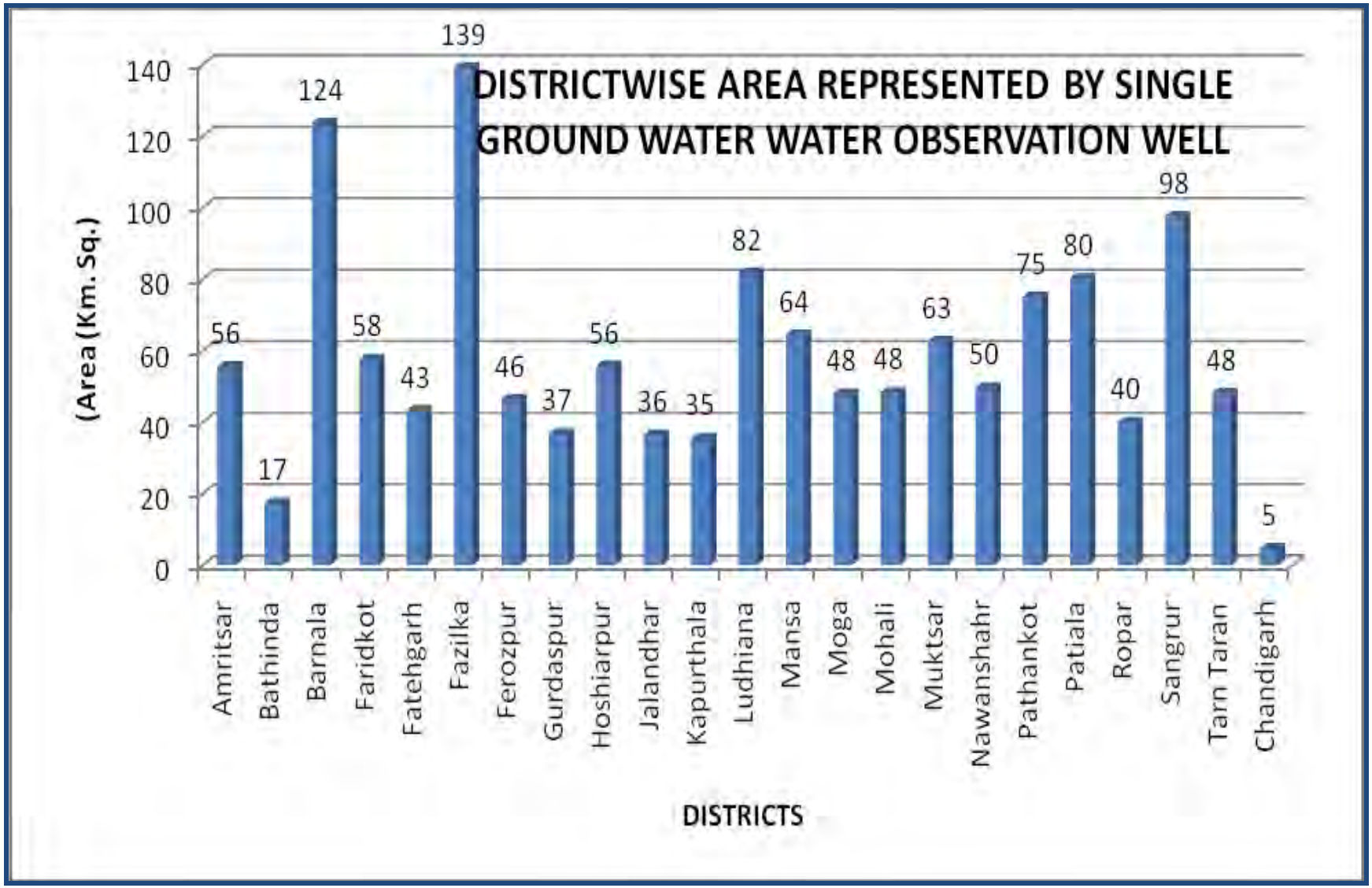


The area represented by single shallow Ground water observation wells being monitored in the state of Punjab and Chandigarh is given in **Table 2** and depicted in Plate **2.**

Table 2. Area represented by single shallow ground water observation well.

S. No.	Districts	Area (km^2)	No. of Shallow Ground water observation wells as on 31.3.2015	Density; Area represented by one GWOW (area/no. of well)
1	Amritsar	2670	48	56
2	Bathinda	1410	81	17
3	Barnala	3340	27	124
4	Faridkot	1440	25	58
5	Fatehgarh	1170	27	43
6	Fazilka	3203	23	139
7	Ferozpur	2647	57	46
8	Gurdaspur	2284	62	37
9	Hoshiarpur	3400	61	56
10	Jalandhar	2660	73	36
11	Kapurthala	1630	46	35
12	Ludhiana	3680	45	82
13	Mansa	2190	34	64
14	Moga	1680	35	48
15	Mohali	1112	23	48
16	Muktsar	2630	42	63
17	Nawanshahr	1190	24	50
18	Pathankot	1276	17	75
19	Patiala	3290	41	80
20	Ropar	1440	36	40
21	Sangrur	3610	37	98
22	Tarn Taran	2410	50	48
23	Chandigarh	114	24	5

PLATE 2: DISTRICT WISE AREA REPRESENTED BY SINGLE SHALLOW GROUND WATER OBSERVATION WELL



3.1 BEHAVIOUR OF WATER LEVEL

In order to assess the quantitative change in ground water resources, water levels were monitored as a routine of four times in a year. The behaviour of water level in May 2014, August 2014, November 2014 and January 2015 is discussed in following paragraphs The maximum and minimum water levels recorded in different season is given below in Table 3.

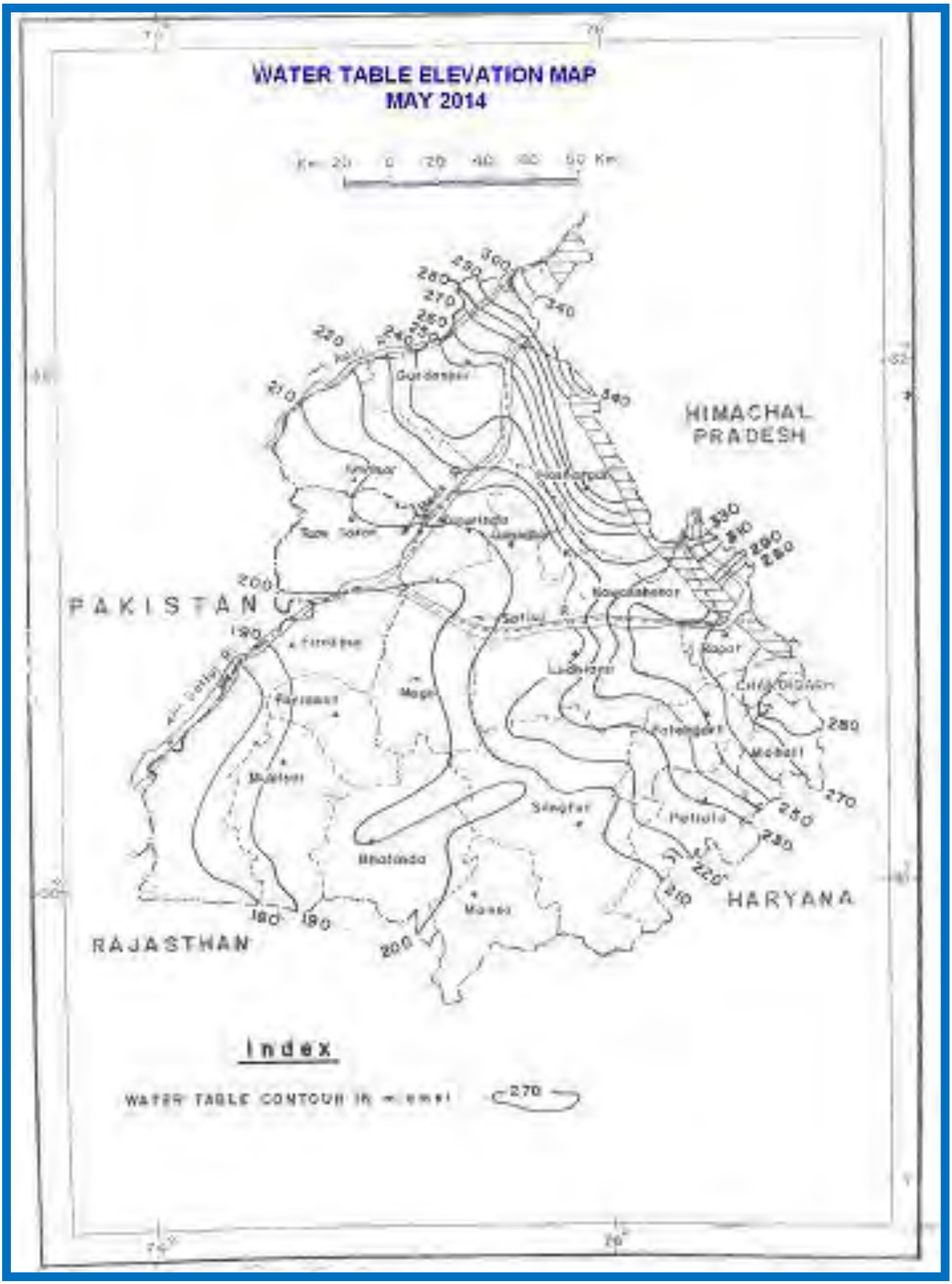
Table3. The maximum and minimum water levels during all four seasons

Range	May 2014	August 2014	November 2014	January 2015
Minimum	0.53 m bgl	0.10 m bgl	0.27m bgl	0.12 m bgl
	(Fazilka district)	(Fazilka district)	(Muktsar district)	(Fazilka district)
Maximum	40.01 m bgl	44.75m bgl	44.30m bgl	42.8m bgl
	(Ludhiana district)	(Chandigarh district)	(Patiala district)	(Hoshiarpur district)

It is evident from the above table-3 that shallowest water level conditions prevail in southwest parts mainly in Faridkot, Muktsar and Ferozpur districts, while deepest water level conditions exist in the central and north eastern parts of the state covering Fatehgarh Sahib, Ludhiana, Rupnagar and Sangrur districts. The water level data of all four seasons is discussed below and given in annexure-I:

3.2 WATER TABLE ELEVATION

The water table elevation (May, 2014) contours have a maximum value of 352.77 m amsl rising in the northeastern part in Pathankot district along the Himalayas to 175.23 m amsl in southwestern part in the Punjab plains (Fazilka district). The general ground water flow direction follows the natural slope. There is not much change in the ground water flow direction which still remains northeast to southwest, but the ground water gradient between contour level 190 m and 180 m in Muktsar/Fazilka districts has become gentle indicating slowing of ground water movement resulting in spreading of water logged areas to other districts. The water table elevation map for May 2014 is shown in Map (Fig. 5)


WATER TABLE ELEVATION MAP
MAY 2014
HIMACHAL PRADESH
PAKISTAN
HARYANA
RAJASTHAN
Gurdaspur
Firozpur
Ferozepur
Moga
Muktsar
Bhatinda
Sangrur
Patiala
Mansa
Index
WATER TABLE CONTOUR IN m amsl
270

3.3 SEASONAL FLUCTUATIONS

3.3.1 JANUARY 2014 - MAY 2014

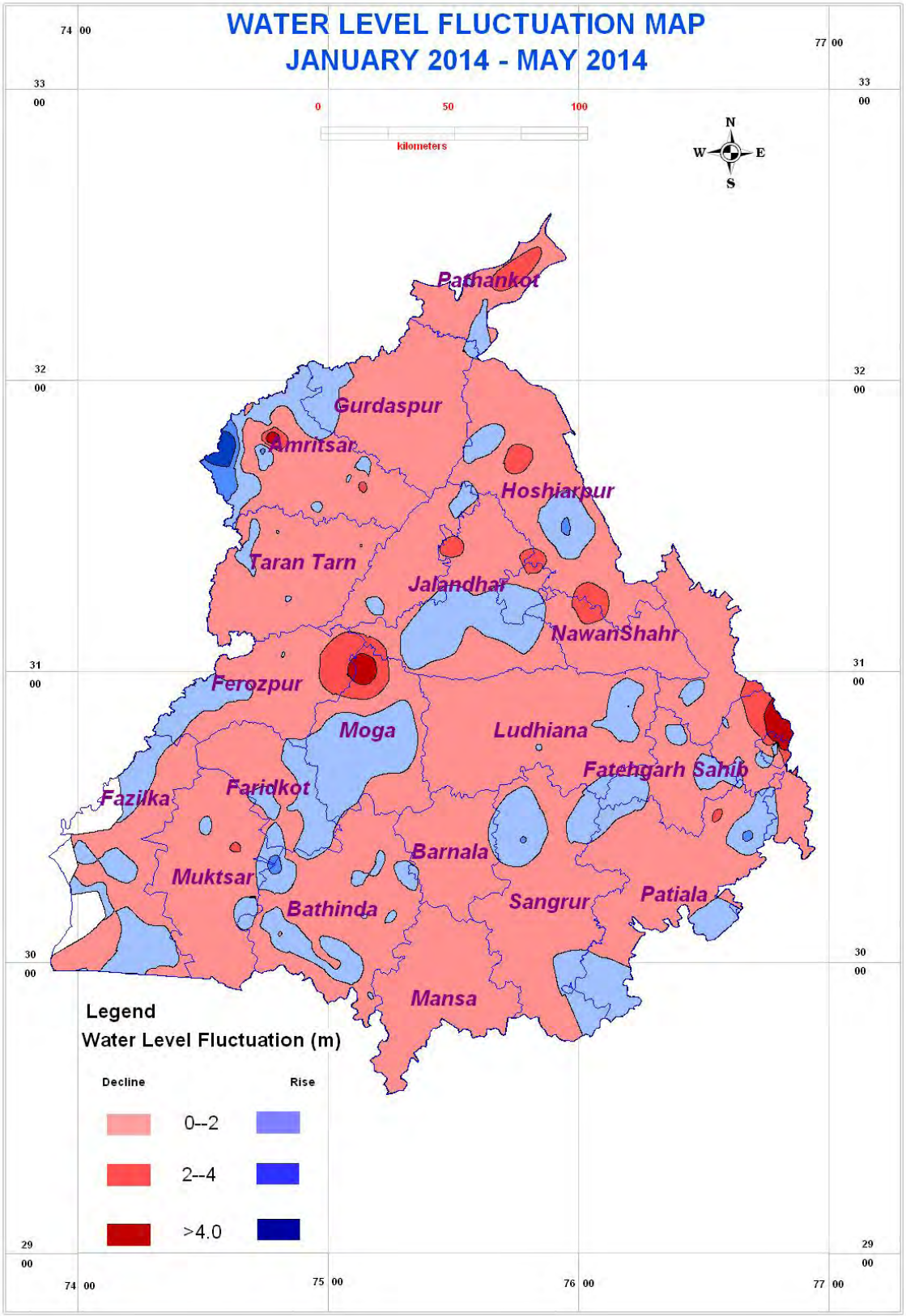
Water level data of May 2014 when compared with previous measurement data i.e. January 2014 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed along with fluctuation map (Fig. 6) below and the data are presented in Annexure-II (Col.4).

The seasonal fluctuation shows that there is a general decline of water levels in 79% of wells monitored and covering 67% area of the State. The fall has been observed in all districts except some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 63% of wells and 75% of area. Water level decline in the range of 2-4 m is observed in 2% of wells and 4% of area whereas, water level decline of >4m is observed in 2% of wells and <1% of area during the period.

The water level rise has been recorded in 21% of wells monitored and covering 33% area of the State. Water level rise in the range of 0-2 m is observed in 31% of wells and 20% of the area. Water level rise of more than 2m is observed in 2% wells and <1% of area during the period. The water level has been reported in small patches in all districts in south western parts of the state. The magnitude of water level decline is more in those areas, which have received less rainfall during this period.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age of	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	2	2	63	67		2	31	33
Area covered	1	4	75	80		1	20	21


WATER LEVEL FLUCTUATION MAP
JANUARY 2014 - MAY 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Fazilka
Faridkot
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.3.2 MAY 2014 - AUGUST 2014

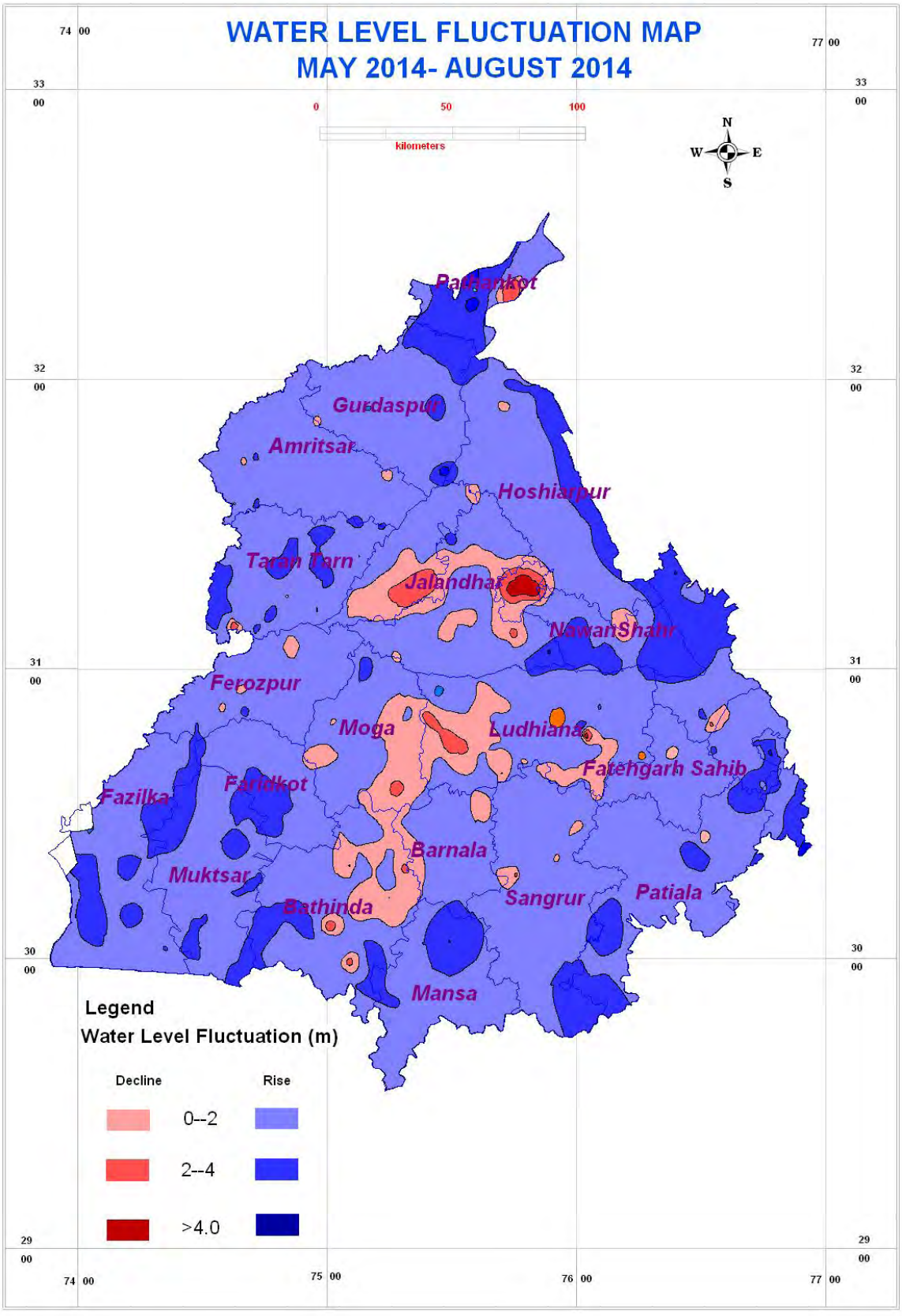
Water level data of August 2014 when compared with water level data of May 2014 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed along with fluctuation map (Fig. 7) below and the data are presented in Annexure-II (Col.5).

The seasonal fluctuation shows decline of water levels in 13% of wells monitored and covering 12% area of the State. The fall has been observed in some isolated patches over the state. Water level decline in the range of 0-2 m is observed in 11% of wells and 11% of area. Water level decline more than 2m is observed in 1% of wells and 1% of area.

The water level rise has been recorded in 87% of wells monitored and covering 88% area of the State. Water level rise in the range of 0-2 m is observed in 63% of wells and 70% of the area in all districts in the state. Water level rise in the range of 2-4m is observed in 19% wells and 18% of area in parts of Kapurthala, Jalandhar, Nawanshahr, Ludhiana, Moga, Bathinda and Fatehgarh Sahib Districts during the period. Water level rise more than 4m is observed in 5% wells and 1% of area during the period. The water level has been reported in small patches in all districts in south western parts of the state.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age of	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	1	1	11	13	5	19	63	87
Area covered	-	1	11	12	1	18	70	88


WATER LEVEL FLUCTUATION MAP
MAY 2014- AUGUST 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Fazilka
Faridkot
Barnala
Muktsar
Sangrur
Patiala
Bathinda
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.3.3 May 2014 - November 2014

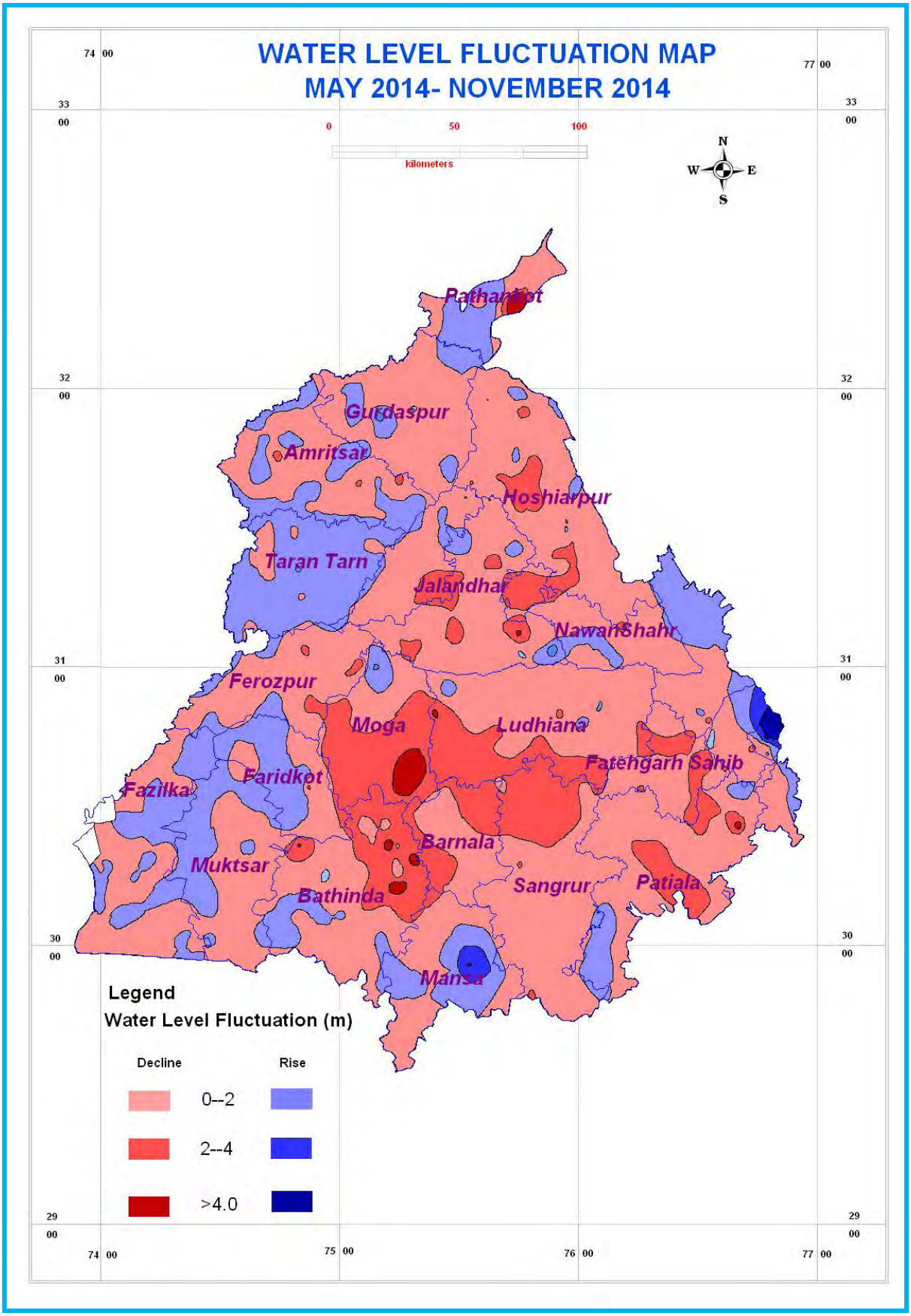
Water level data of November 2014 when compared with pre- monsoon measurement data i.e. May 2014 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed along with fluctuation map (Fig. 8) below and the data are presented in Annexure-II (Col.6).

The seasonal fluctuation between May 2014 and November 2014 shows that there is a general decline of water levels in 75% of wells monitored and covering 78% area of the State. The fall has been observed in all districts except some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 55% of wells and 63% of area. Water level decline in the range of 2-4 m is observed in 18% of wells and 14% of area in parts of Jalandhar, Fatehgarh Sahib, Ludhiana, Sangrur, moga, barnala and Bathinda districts whereas, water level decline of >4m is observed in 2% of wells and 1% of area during the period.

The water level rise has been recorded in 25% of wells monitored and covering 22% area of the State. Water level rise in the range of 0-2 m is observed in 24% of wells and 21% of the area. Water level rise of more than 2m is observed in 1% wells and <1% of area during the period. The water level has been reported in small patches in all districts in south western parts of the state. The magnitude of water level decline is more in those areas, which have received less rainfall during this period.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				rise			
%age of	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	2	18	55	75		1	24	25
Area covered	1	14	63	78		1	21	22


WATER LEVEL FLUCTUATION MAP
MAY 2014- NOVEMBER 2014
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
Nawanshahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Faridkot
Fazilka
Barnala
Muktsar
Sangrur
Patiala
Bathinda
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0
74 00
75 00
76 00
77 00
33 00
32 00
31 00
30 00
29 00

3.3.4 May 2014 - January 2015

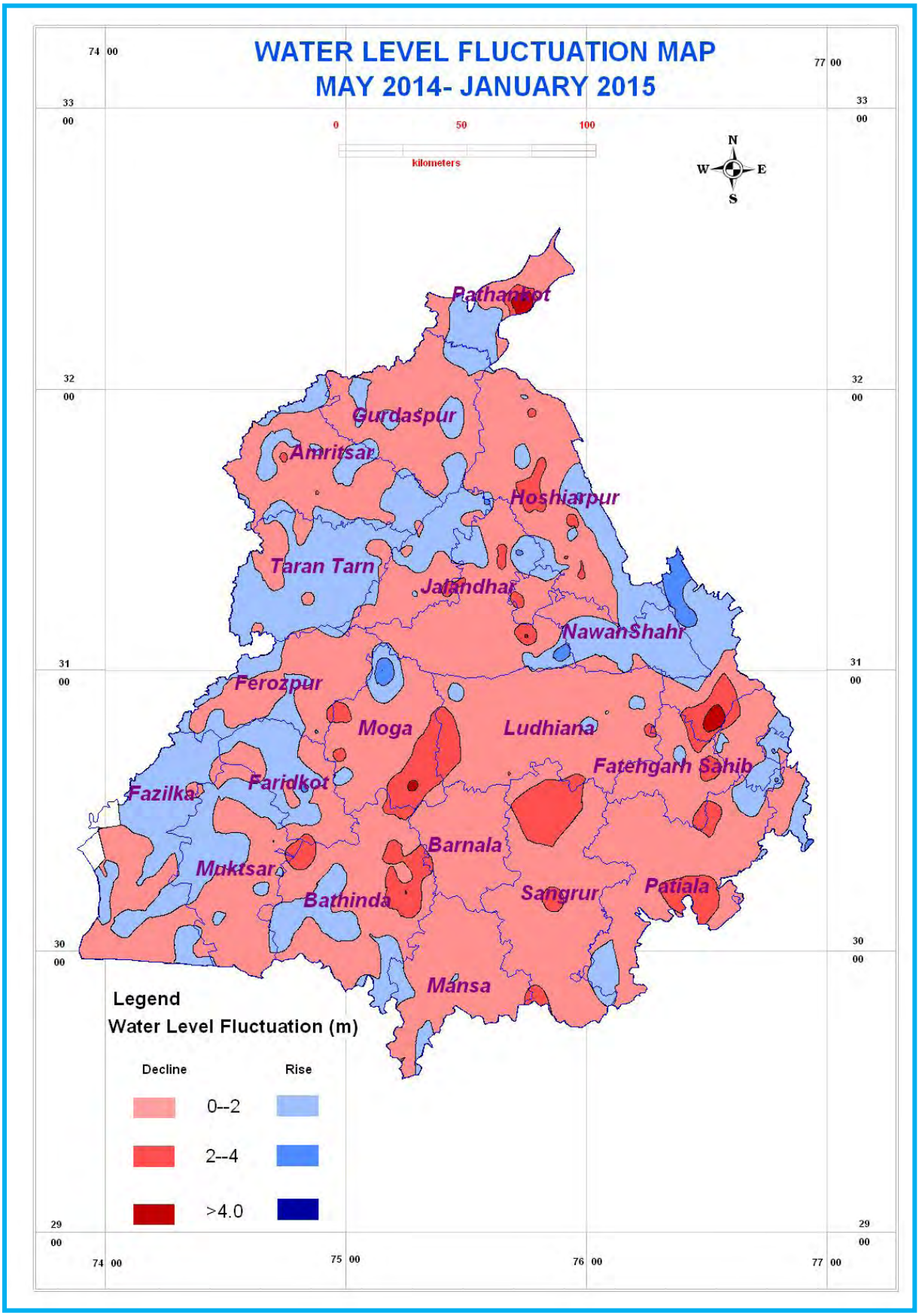
Water level data of January 2015 when compared with pre- monsoon measurement data i.e. May 2014 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed along with fluctuation map (Fig. 9) below and the data are presented in Annexure-II (Col.7).

The seasonal fluctuation between May 2014 and January 2015 shows that there is a general decline of water levels in 73% of wells monitored and covering 67% area of the State. The fall has been observed in all districts except some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 58% of wells and 66% of area. Water level decline in the range of 2-4 m is observed in 8% of wells and 6% of area whereas, water level decline of >4m is observed in <1% of wells and <1% of area during the period.

The water level rise has been recorded in 33% of wells monitored and covering 26% area of the State. Water level rise in the range of 0-2 m is observed in 30% of wells and 25% of the area. Water level rise of more than 2m is observed in 3% wells and <1% of area during the period. The water level has been reported in small patches in all districts in south western parts of the state. The magnitude of water level decline is more in those areas, which have received less rainfall during this period.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age of	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	1	8	58	67		3	30	33
Area covered	1	6	66	73		1	25	26


WATER LEVEL FLUCTUATION MAP
MAY 2014- JANUARY 2015
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Fazilka
Faridkot
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.4 ANNUAL FLUCTUATIONS

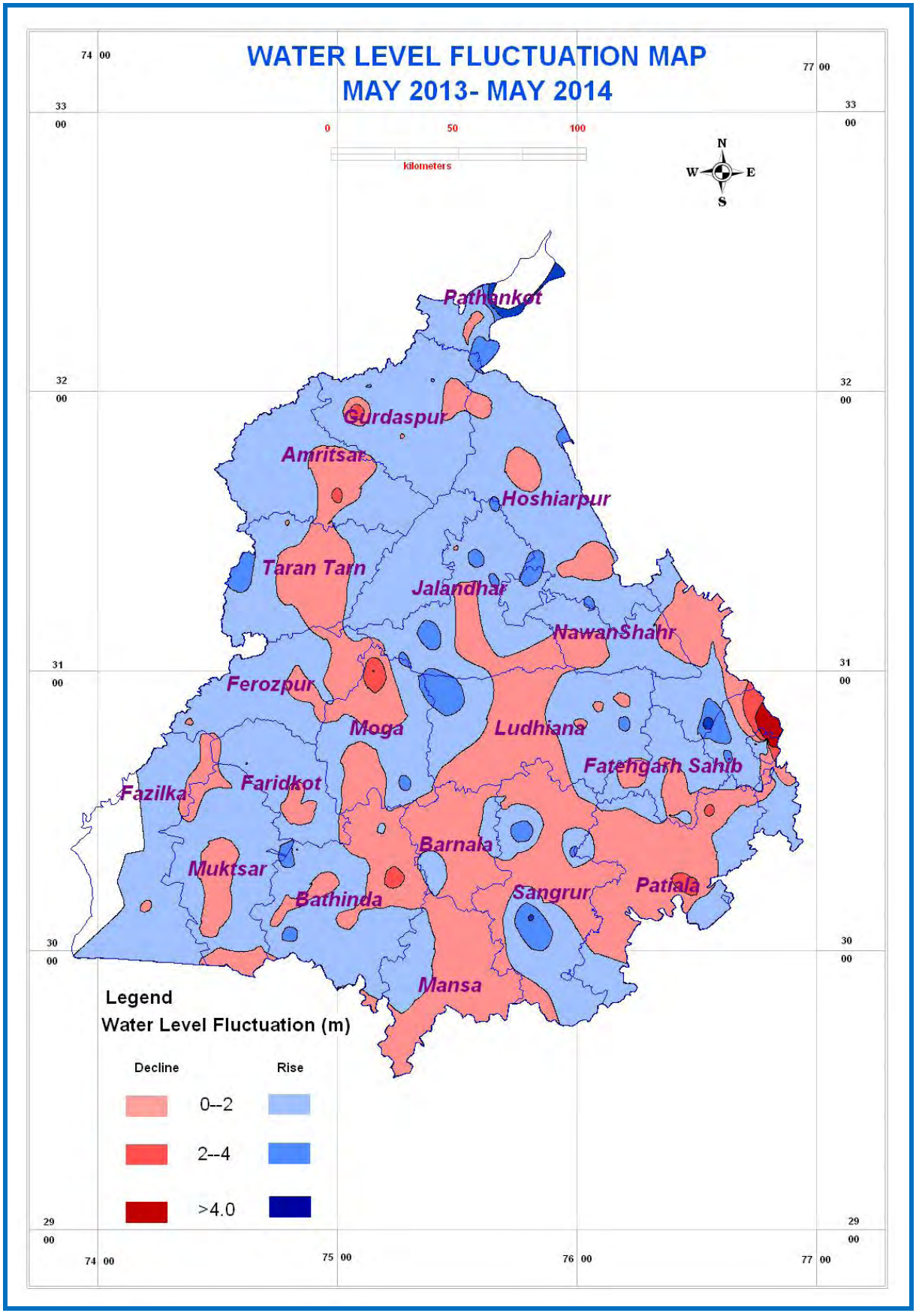
3.4.1 MAY 2013 - MAY 2014

In order to know the impact of rainfall and ground water withdrawal during last one year, annual water level fluctuations for period May 2013 and May 2014 are calculated. The behavioral pattern of annual fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 10).** Water level fluctuations data are given in the Annexure-III (Col-4).

The annual fluctuation shows that there is a general decline of water levels in 35% of wells monitored and covering 34% area of the State. The decline has been observed in south-central Punjab, covering the parts of Jalandhar, Ludhiana, Fatehgarh Sahib, Moga, Barnala, Sangrur, Patiala and Mansa districts. Water level decline the range of 0-2 m is observed in 32% of wells and 33% of the area. Water level decline in the range of 2-4 m is observed in 2% of wells and 1% of the area whereas, water level decline >4m is observed in 1% of wells and 4% of the area during the period. The water level rise has been recorded in 65% of wells monitored and covering 66% area of the State. The water levels rise has been observed in Pathankot, Gurdaspur, Amritsar, Tarntaran, Kapurthala, Hoshiarpur, Nawanshahr, Jallandhar, and SAS Nagar districts in north and north eastern parts. Rise in water level is also observed in all the districts of south western parts of the state. Water level rise in the range of decline 0-2 m is observed in 63% wells and 58% of area. Water level rise of more than 2m is observed in 4% wells and 7% of area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	1	2	32	35		4	63	67
Area covered	4	1	33	34		7	58	65


WATER LEVEL FLUCTUATION MAP
MAY 2013- MAY 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Fazilka
Faridkot
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.4.2 AUGUST 2013 - AUGUST 2014

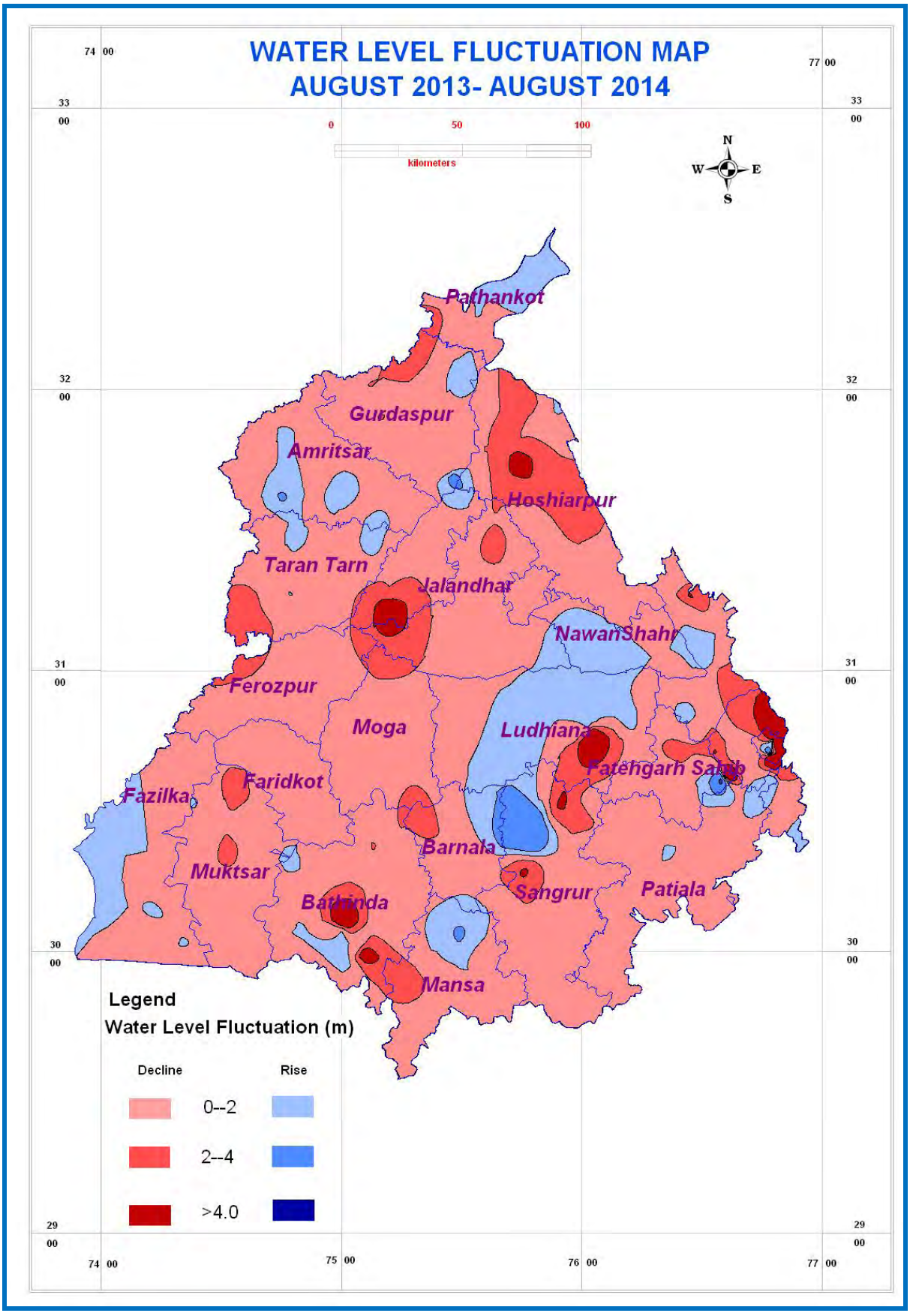
In order to know the impact of rainfall and ground water withdrawal during last one year, annual water level fluctuations for period August 2013 and August 2014 are calculated. The behavioral pattern of annual fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 11).** Water level fluctuations data are given in the Annexure-III (Col-5).

The annual fluctuation shows that there is a general decline of water levels in 79% of wells monitored and covering 85% area of the State. Water level decline the range of 0-2 m is observed in 64% of wells and 72% of the area in all districts in the state. Water level decline in the range of 2-4 m is observed in 10% of wells and 11% of the area covering the parts of Kapurthala, Jalandhar, Hoshiarpur, Ludhiana, Fatehgarh Sahib, Moga, Barnala, Sangrur, Patiala and Mansa districts. Water level decline >4m is observed in 5% of wells and 2% of the area during the period.

The water level rise has been recorded in 21% of wells monitored and covering 15% area of the State. The water levels rise has been observed in Pathankot, Gurdaspur, Amritsar, Tarntaran, Nawanshahr, Ludhiana, Sangrur and Patiala districts. Rise in water level is also observed in all the districts of south western parts of the state. Water level rise in the range of decline 0-2 m is observed in 17% wells and 13% of area. Water level rise of more than 2m is observed in 3% wells and 2% of area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below.

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	5	10	64	79	2	1	17	21
Area covered	2	11	72	85	1	1	13	15


WATER LEVEL FLUCTUATION MAP
AUGUST 2013- AUGUST 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Faridkot
Fazilka
Barnala
Muktsar
Sangrur
Patiala
Bathinda
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.4.3 November 2013 - November 2014

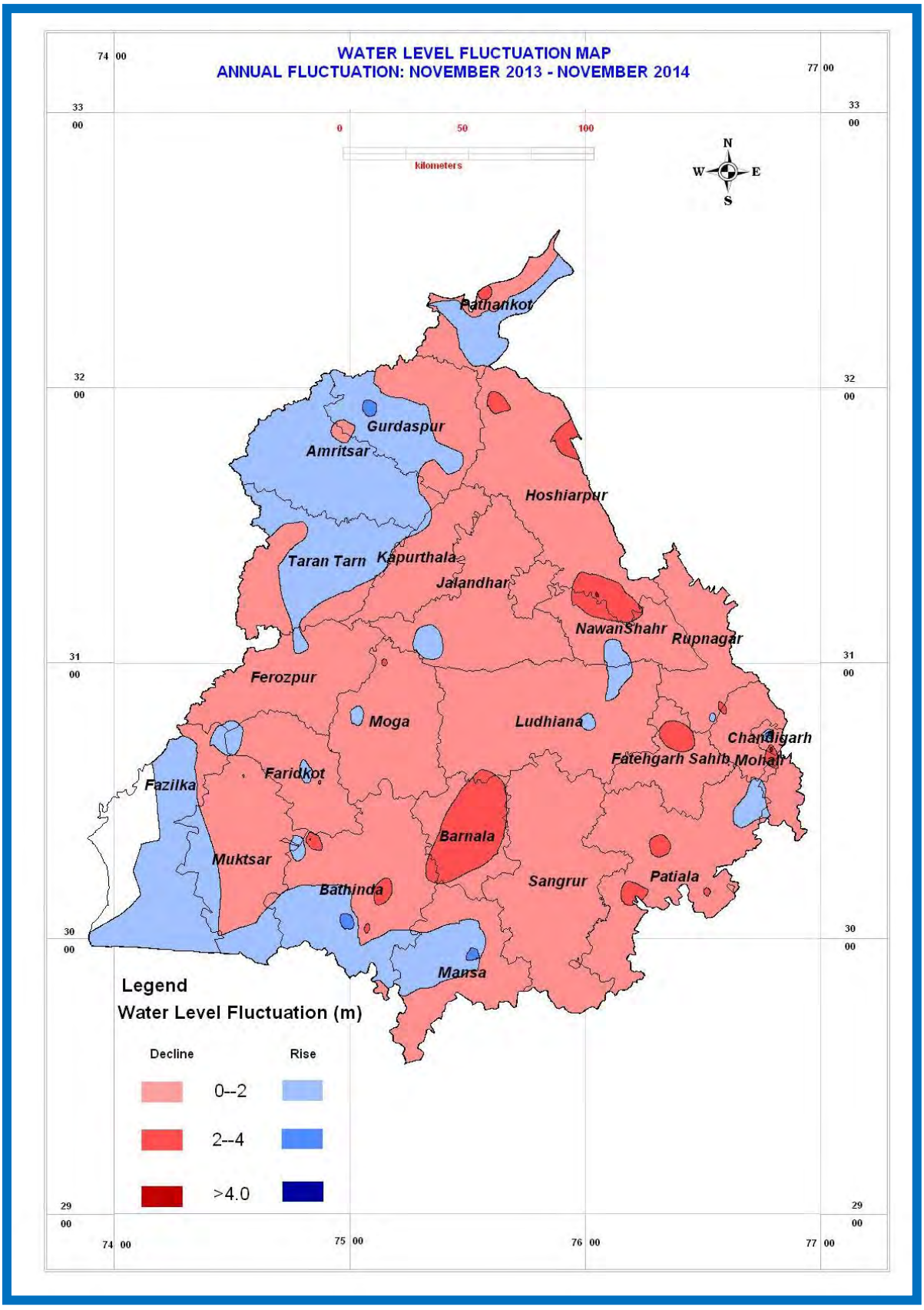
In order to know the impact of rainfall and ground water withdrawal during last one year, annual water level fluctuations for period November 2013 and November 2014 are calculated. The behavioral pattern of annual fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 12).** Water level fluctuations data are given in the Annexure-III (Col-6).

The annual fluctuation shows that there is a general decline of water levels in 70% of wells monitored and covering 77% area of the State. The decline has been observed in all districts except in parts of Gurdaspur, Amritsar and Tarntaran in north and Fazilka, Muktsar, Bathinda and Mansa districts in south-western parts of the state. Water level decline the range of 0-2 m is observed in 61% of wells and 73% of the area. Water level decline in the range of 2-4 m is observed in 8% of wells and 4% of the area whereas, water level decline >4m is observed in 1% of wells and <1% of the area during the period.

The water level rise has been recorded in 30% of wells monitored and covering 23% area of the State. The water levels rise has been observed in Pathankot, Gurdaspur, Amritsar, Tarntaran districts in north and Fazilka, Muktsar, Bathinda and Mansa districts in south-western parts of the state. Rise in water level is also observed in all the districts of south western parts of the state. Water level rise in the range of decline 0-2 m is observed in 29% wells and 22% of area. Water level rise of more than 2m is observed in 1% wells and <1% of area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	1	8	61	70	1	1	29	30
Area covered	1	4	73	77	1	1	22	23


WATER LEVEL FLUCTUATION MAP
ANNUAL FLUCTUATION: NOVEMBER 2013 - NOVEMBER 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Kapurthala
Jalandhar
NawanShahr
Rupnagar
Ferozpur
Moga
Ludhiana
Chandigarh
Fatehgarh Sahib
Mohali
Faridkot
Fazilka
Barnala
Muktsar
Sangrur
Patiala
Bathinda
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.4.4 January 2014 - January 2015

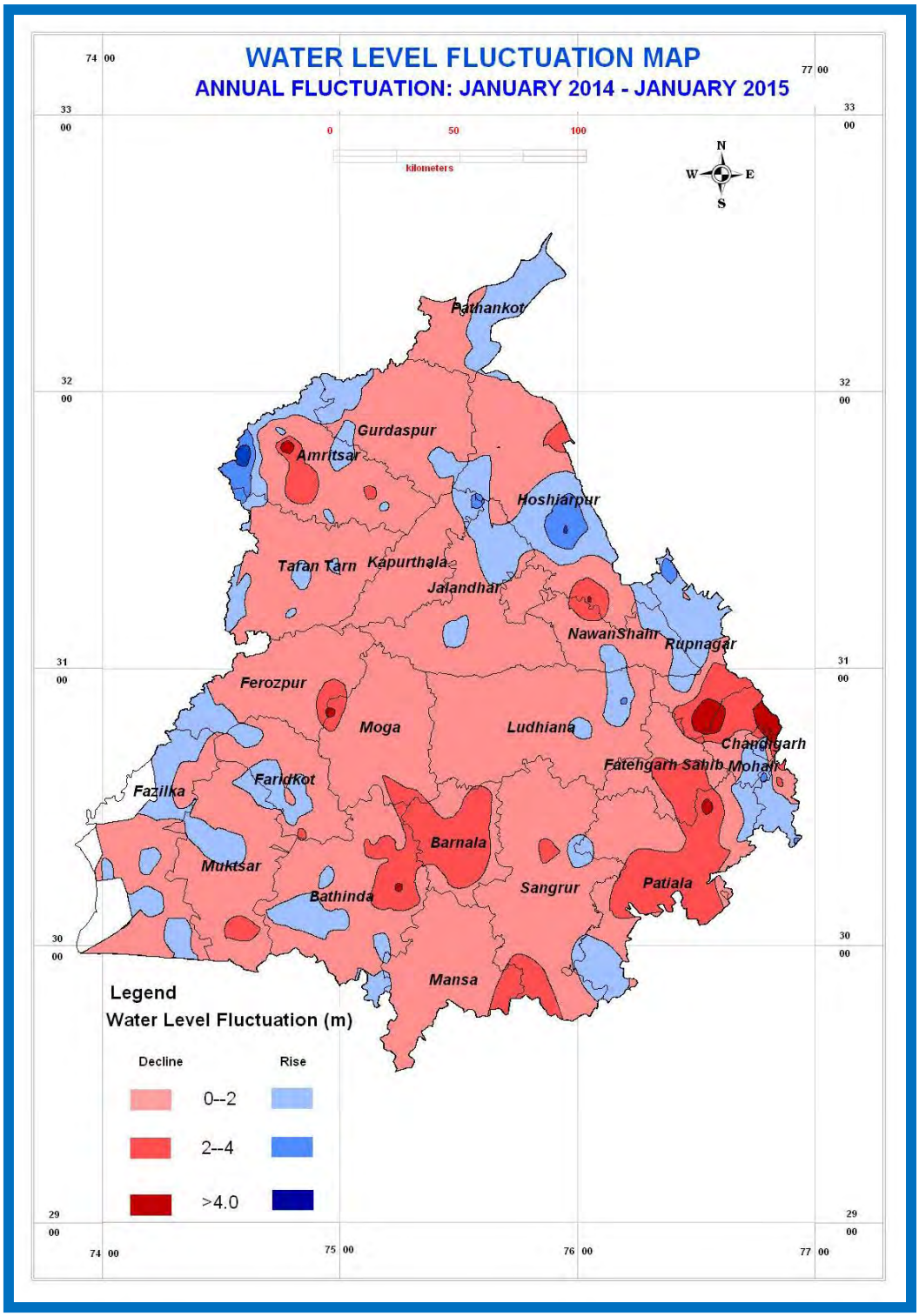
In order to know the impact of rainfall and ground water withdrawal during last one year, annual water level fluctuations for period January 2014 and January 2015 are calculated. The behavioral pattern of annual fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 13).** Water level fluctuations data are given in the Annexure-III (Col-7).

The annual fluctuation shows that there is a general decline of water levels in 74% of wells monitored and covering 83% area of the State. The decline has been observed in all districts in the state. Water level decline the range of 0-2 m is observed in 62% of wells and 72% of the area. Water level decline in the range of 2-4 m is observed in 10% of wells and 10% of the area whereas, water level decline >4m is observed in 2% of wells and <1% of the area during the period.

The water level rise has been recorded in 26% of wells monitored and covering 17% area of the State. The water levels rise has been observed in Pathankot, Gurdaspur, Amritsar, Hoshiarpur, Nawanshahr, SAS Nagar districts in north and north eastern parts. Rise in water level is also observed in parts of Ferozpur, Fazilka, Muktsar, and Bathinda in south and south western parts of the state. Water level rise in the range of decline 0-2 m is observed in 22% wells and 16% of area. Water level rise of more than 2m is observed in 4% wells and 1% of area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	total	>4	4-2	2-0	total
Wells monitored	2	10	62	74	2	4	22	26
Area covered	1	10	72	83	1	1	16	17


WATER LEVEL FLUCTUATION MAP
ANNUAL FLUCTUATION: JANUARY 2014 - JANUARY 2015
74 00
77 00
33 00
32 00
31 00
30 00
29 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Tarn Taran
Kapurthala
Jalandhar
NawanShahr
Rupnagar
Ferozpur
Moga
Ludhiana
Chandigarh
Fatehgarh Sahib
Mohali
Faridkot
Fazilka
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0
74 00
75 00
76 00
77 00

3.5 DECADAL MEAN FLUCTUATIONS

3.5.1 Mean of May (2004:2013) & May 2014

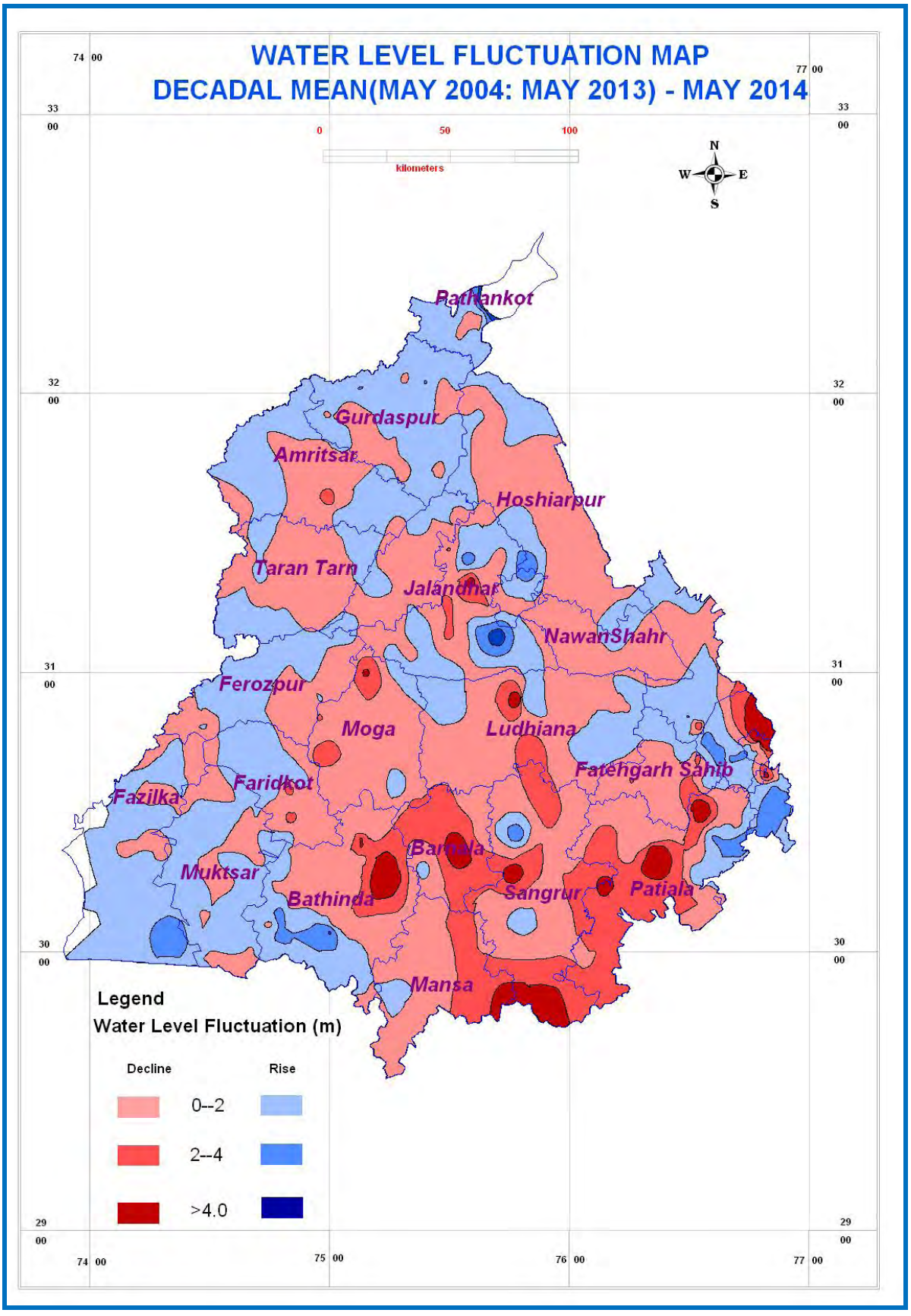
Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2004-2013) for each ground water observation well is computed and compared with the respective water level data of May 2014. The behavioral pattern of decadal mean fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 14).** Water level fluctuations data are given in the Annexure-IV (Col-4).

The decadal mean fluctuations show that decline in 56% of observation wells monitored covering about 59% area of the state. The decline has been observed in south and central parts of the state covering the parts of Amritsar, Tarntaran, Kapurthala, Jallandhar, Ludhiana, Fatehgarh Sahib, Moga, Barnala, Sangrur, Patiala and Mansa districts. The decline of 0-2 m has been observed in about 53% of wells and 42% of area. Water level decline of 2-4 m is observed in ~2% of the wells and 14% of the area. Water level decline of >4m is observed in about 1% of the wells and 3% of area.

Rise in water level has also been observed in 44% of wells and 41% of area in Pathankot, Pathankot, Gurdaspur, Amritsar, Tarntaran, Kapurthala, Hoshiarpur, Nawanshahr, Jalandhar, Ropar and SAS Nagar districts in north and north eastern parts. Rise in water level is also observed in Ferozpur, Fazilka, Muktsar, Bathinda and Faridkot districts. Water level rise in the range of 0-2 m is observed in 38% of wells and 37% of the area. Water level rise of >2 m is observed in 6%of wells and 4% of the area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	Total	>4	4-2	2-0	Total
Wells monitored	1	2	53	56	-	6	38	44
Area covered	3	14	42	59	-	4	37	41


WATER LEVEL FLUCTUATION MAP
DECADAL MEAN(MAY 2004: MAY 2013) - MAY 2014
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Faridkot
Fazilka
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0
74 00
75 00
76 00
77 00
33 00
32 00
31 00
30 00
29 00

3.5.2 MEAN OF AUGUST (2004:2013) & AUGUST 2014

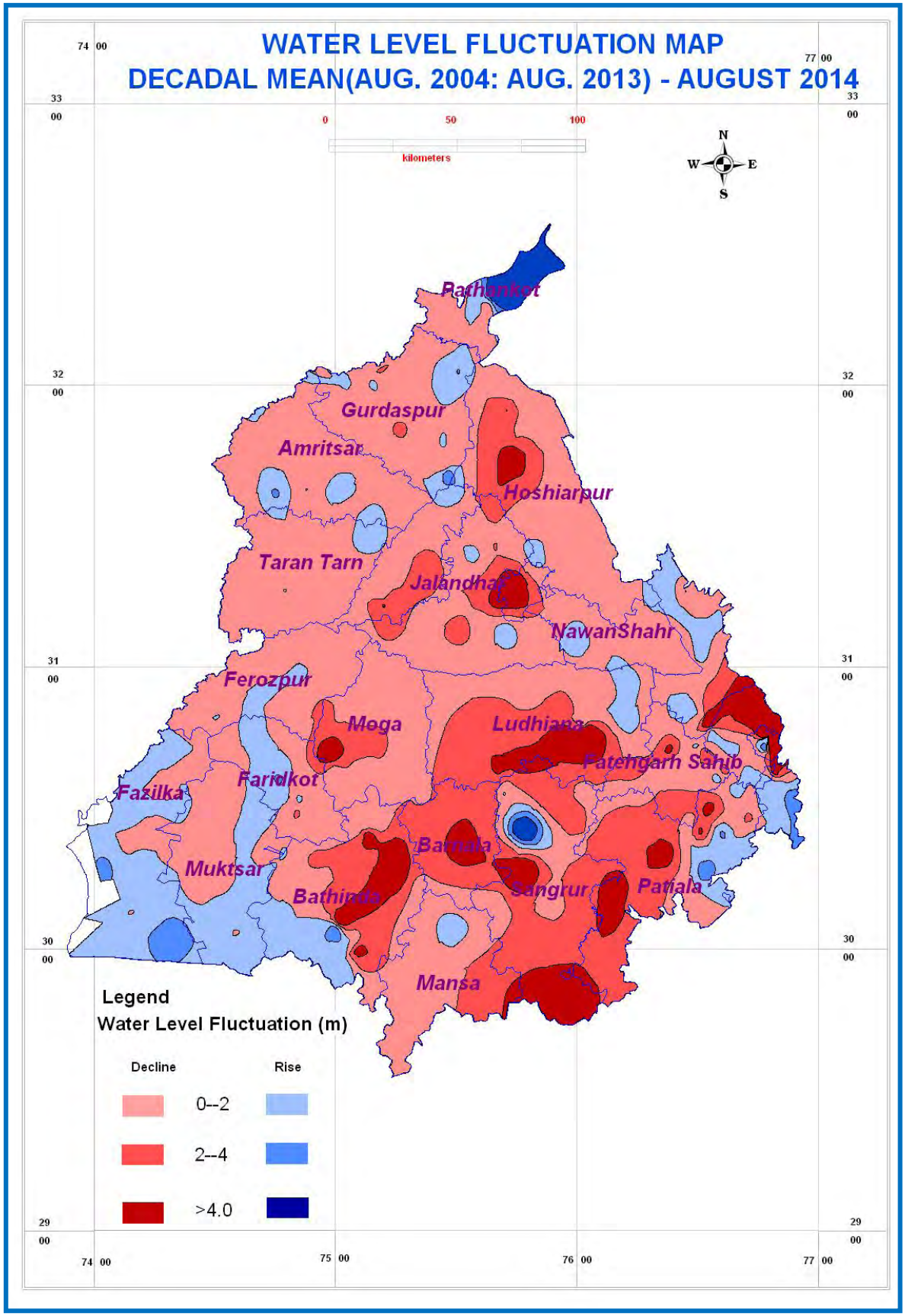
Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2004-2013) for each ground water observation well is computed and compared with water level data collected in August 2014. The behavioral pattern of decadal mean fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 15).** Water level fluctuations data are given in the Annexure-IV (Col-5).

The decadal mean fluctuations show that decline in 72% of observation wells monitored covering about 81% area of the state. The decline has been observed in all districts of the state. The decline of 0-2 m has been observed in about 49% of wells and 55% of area. Water level decline of 2-4 m is observed in 14% of the wells and 19% of the area covering the parts of Hoshiarpur, Kapurthala, Jalandhar, Ludhiana, Fatehgarh Sahib, SAS Nagar, Chandigarh, Moga, Barnala, Sangrur, Patiala and Mansa districts.. Water level decline of >4m is observed in about 9% of the wells and 7% of area in isolated patches.

Rise in water level has also been observed in 28% of wells and 19% of area in Pathankot, Hoshiarpur, Ropar and SAS Nagar districts in north and north eastern parts. Rise in water level is also observed in Ferozpur, Fazilka, Muktsar, Bathinda and Faridkot districts. Water level rise in the range of 0-2 m is observed in 23% of wells and 16% of the area. Water level rise of >2 m is observed in 5%of wells and 3% of the area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	Total	>4	4-2	2-0	Total
Wells monitored	9	14	49	72		5	23	28
Area covered	7	19	55	81		3	16	19


WATER LEVEL FLUCTUATION MAP
DECADAL MEAN(AUG. 2004: AUG. 2013) - AUGUST 2014
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Faridkot
Fazilka
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0
74 00
75 00
76 00
77 00
33 00
32 00
31 00
30 00
29 00

3.5.3 Decadal Mean November (2004:2013) & November 2014

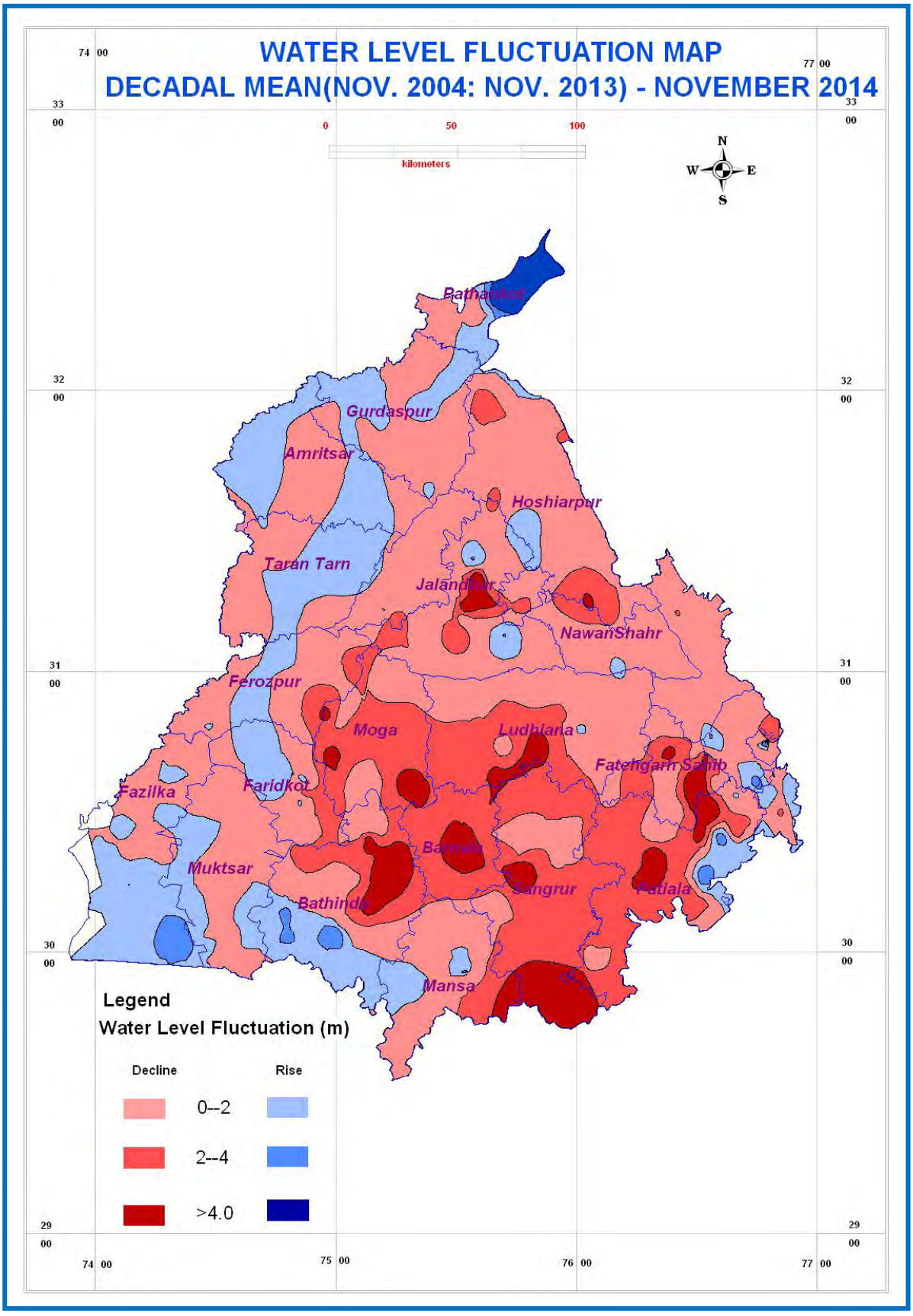
Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2004-2013) for each ground water observation well is computed and compared with the respective water level data of November 2014. The behavioral pattern of decadal mean fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 15).** Water level fluctuations data are given in the Annexure-IV (Col-6).

The decadal mean fluctuations show that shows decline in 74% of observation wells monitored covering about 79% area of the state. The decline has been observed in all districts of the state. The water level decline in range of 0-2m has been observed in about 46% of wells and 52% of area. Water level decline in range of 2-4m is observed in 19% of the wells and 22% of the area in parts of Jalandhar, Hoshiarpur, Ludhiana, Moga, barnala, Bathinda, Sangrur, Patiala and Fatehgarh sahib districts. Water level decline of >4m is observed in about 9% of the wells and 5% of area in parts of Ludhiana, Moga, barnala, Bathinda, Sangrur, Patiala and Fatehgarh sahib districts.

Rise in water level has also been observed in 26% of wells and 21% of area in Pathankot, Gurdaspur, Amritsar, Tarntaran districts in north. Rise in water level is also observed in Ferozpur, Fazilka, Faridkot, Muktsar, Bathinda and Mansa districts. Water level rise in the range of 0-2 m is observed in 23% of wells and 19% of the area. Water level rise of >2 m is observed in 3%of wells and 2% of the area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	Total	>4	4-2	2-0	Total
Wells monitored	9	19	46	74		3	23	26
Area covered	5	22	52	79		2	19	21


WATER LEVEL FLUCTUATION MAP
DECADAL MEAN(NOV. 2004: NOV. 2013) - NOVEMBER 2014
74 00
77 00
33 00
32 00
31 00
30 00
29 00
75 00
76 00
0
50
100
kilometers
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Fatehgarh Sahib
Fazilka
Faridkot
Barnala
Muktsar
Sangrur
Patiala
Bathinda
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

3.5..4 Decadal Mean of January (2005:2014) & January 2015

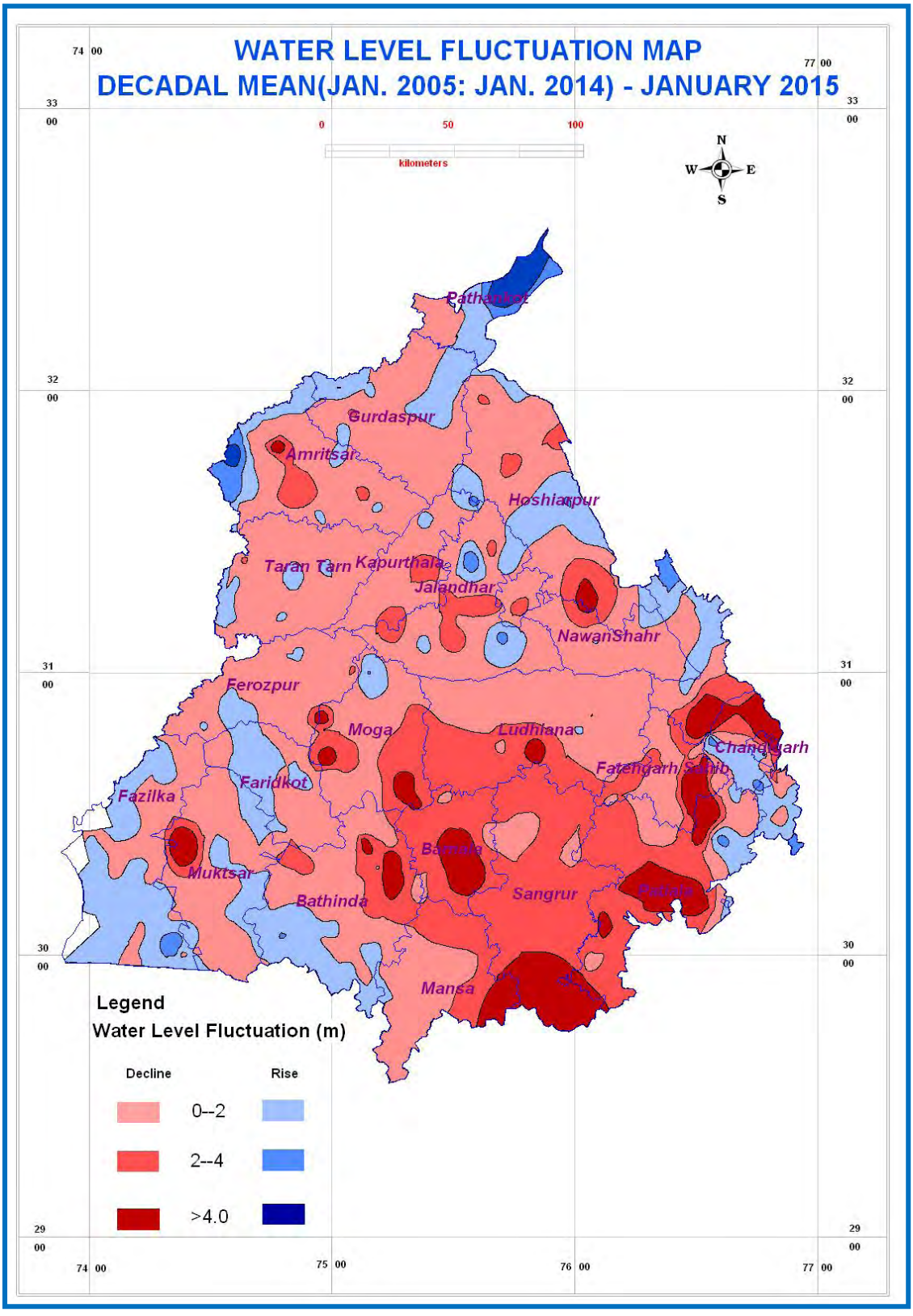
Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2005-2014) for each ground water observation well is computed and compared with the respective water level data of January 2015. The behavioral pattern of decadal mean fluctuations is discussed in the following paragraph along with fluctuation map **(Fig. 17).** Water level fluctuations data are given in the Annexure-IV (Col-7).

The decadal mean fluctuations show that decline in 75% of observation wells monitored covering about 81% area of the state. The decline has been observed in all districts in the state. The decline of 0-2 m has been observed in about 54% of wells and 54% of area. Water level decline of 2-4 m is observed in 14% of the wells and 22% of the area. Water level decline of >4m is observed in about 7% of the wells and 5% of area.

Rise in water level has also been observed in 25% of wells and 19% of area in Pathankot, Gurdaspur, Amritsar, Tarntaran, Kapurthala, Hoshiarpur, Nawanshahr, Ropar and SAS Nagar districts in north and north eastern parts. Rise in water level is also observed in Ferozpur, Fazilka, Muktsar, Bathinda and Faridkot districts. Water level rise in the range of 0-2 m is observed in 21% of wells and 17% of the area. Water level rise of >2 m is observed in 4%of wells and 2% of the area.

Summarized details of seasonal water level fluctuation in different ranges are given in table below

Summarized details of behaviour of depth to water level								
Water level fluctuation(m)	Fall				Rise			
%age	>4	4-2	2-0	Total	>4	4-2	2-0	Total
Wells monitored	7	14	54	75		4	21	25
Area covered	5	22	54	81		2	17	19


WATER LEVEL FLUCTUATION MAP
DECADAL MEAN(JAN. 2005: JAN. 2014) - JANUARY 2015
kilometers
0
50
100
N
W
E
S
Pathankot
Gurdaspur
Amritsar
Hoshiarpur
Taran Tarn
Kapurthala
Jalandhar
NawanShahr
Ferozpur
Moga
Ludhiana
Chandigarh
Fatehgarh Sahib
Faridkot
Fazilka
Barnala
Muktsar
Bathinda
Sangrur
Patiala
Mansa
Legend
Water Level Fluctuation (m)
Decline
Rise
0--2
2--4
>4.0

4.0 GROUND WATER QUALITY IN PUNJAB

Evaluation of ground water quality through concentration of its physical, chemical and biological parameters is essential to determine its suitability for the intended use. It helps not only in finding its suitability; it also helps in taking effective remedial measures for its improvement on scientific lines. In most of rural and semi-urban areas of Punjab State, ground water is a major resource for drinking and irrigation uses especially in areas where surface water is inadequate or unavailable. Acknowledging the importance of this aspect of ground water, C.G.W.B., N.W.R., Chandigarh annually monitors the ground water quality through dedicated Ground Water Monitoring Stations consisting of dug wells and/or hand pumps of shallow depth. During May 2014, 276 no. ground water samples were collected from these structures spread uniformly over 19 districts of Punjab and no specific treatment such as acidification or filtration was given at the time of sampling. The water samples were analyzed for major cations (Ca, Mg, Na, K) and anions (CO_3, HCO_3, Cl, NO_3, SO_4) in addition to pH, EC, F and TH as $CaCO_3$ in the Regional Chemical Laboratory by following 'Standard analytical procedures' as given in APHA 2012. Results of chemical analysis of water samples are placed in Appendix-I

4.1 Composition of Water

The district-wise concentration range of various chemical components in ground water is depicted in Table 1. The chemical composition of ground water of Punjab state is discussed below

pH : The ground water is slightly to moderately alkaline in nature. The pH values range from 7.00 at Sathaiali in Gurdaspur district to 9.46 at Gurusar in Bathinda district.

***Salinity*:** salinity of ground water is measured in terms of EC. The ground water is found to have low to very high salt content as the EC of well water ranges from 198 μS/cm. at Nawapind in district Gurdaspur to 8415 μS/cm at Abohar in district Firozepur.

Hardness: It is reported in terms of $CaCO_3$. The hardness value of ground water generally ranges from 31 to 2920 mg/l. The lowest hardness value is found at Sahawala, district Firozepur and highest at Lambi in district Bathinda.

***Calcium and Magnesium*:** The concentration of calcium ranges between nil and 245mg/l. The lowest value is found at Gulabgarh, district Bathinda and Kundal in district Firozepur, whereas highest value is observed at Doda in district Muktsar. Magnesium concentration ranges between nil at Sahwala, district Firozepur and 690mg/l at Lambi in district Bathinda. In majority of ground water samples, calcium concentration is less than 100 mg/l (98%). Calcium is very low in some districts, though it is very essential element for drinking and irrigation purposes. However, magnesium is less than the desirable limit of 30 mg/l in 42% samples and less than the maximum

permissible limit of 100 mg/l for drinking waters (BIS 1991) in 93% samples. In more than half of well waters examined, Ca + Mg are the dominant cations having their concentration almost 50% of the total cation determined.

***Sodium and Potassium*:** Sodium is the dominant cation in majority of ground waters of districts Barnala, Bhathinda, Faridkot, Ferozepur, Mansa, Moga, Muktsar, Patiala, Sangrur, SAS Nagar and Tarantaran. Its concentration varies widely from 2.0 mg/l at Nawapind, district Gurdaspur to 1750 mg/l at Abohar in district Ferozepur. Sodium concentration is less than 100 mg/l in more than half of well waters under consideration. Potassium is found to be present in low concentration. In majority of the samples analyzed, the potassium content is less than 10 mg/l (67%). It ranges from 0.3 mg/l at Brahmpur, district Ropar to 760 mg/l at Bhaigi Bandar, district Bathinda. High concentration of potassium (>100mg/l) is found in 8% samples. Its higher concentration indicates contamination of ground water from various point (industry, sewage) as well as non-point sources (agriculture).

Carbonate and bicarbonate: Carbonate is found in a few samples and it varies from nil to 343mg/l at Gurusar in district Bathinda. Bicarbonate is the dominant anion and it ranges from 37mg/l at Jaimalwal, district Firozepur to 1121 mg/l at Gurusar, district Bathinda.

***Chloride*:** The chloride concentration in ground water varies broadly between 3.5 mg/l at Thakkarwala, district Hoshiarpur and 2084 mg/l at Lambi in district Bathinda.

***Sulphate*:** The sulphate (SO_4) content in ground waters was found to be nil at a few places in district Gurdaspur, Hoshiarpur, Patiala and Amritsar. The highest value of 2092mg/l of sulphate has been observed at Abohar in district Ferozepur. In majority of ground water samples (82%), the concentration of sulphate is below 200 mg/l.

***Nitrate*:** Nitrate, an indicator of domestic, irrigation and industrial contamination, is found in significant number of samples. Its concentration in groundwater ranges from nil at a few places to 675 mg/l at Bhaliana, district Muktsar.

***Fluoride*:** The fluoride (F) content in ground water of the State is generally less than 1.0 mg/l (84%). It ranges from nil at Dhianpur in district Gurdaspur to 7.46 mg/l at Kot Shamir, district Mansa.

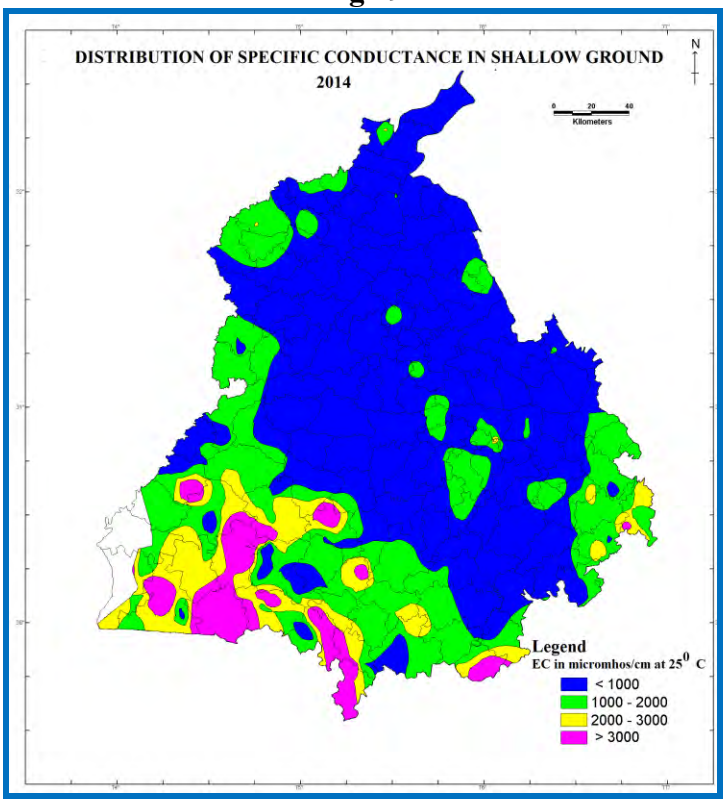
Table-1 : Range of Chemical Constituents in Groundwater of Punjab State

Sr. No	DISTRICT	No. of	Range	pH	EC in µS/cm at 25^{0}C	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
		Samples				(<---------- mg/l----------->)														meq/l
1	AMRITSAR	9	Min	**7.15**	325	0	175	14	0	0	0.05	nd	21	13	25	3.8	22	105	0.90	-4.6
			Max	8.05	2032	0	416	160	352	186	0.57	0.05	130	46	220	32	30	515	4.92	4.7
	BARNALA	7	Min	7.2	277	0	127	22	0	2.4	0.3	nd	5.8	15	7.6	2.4	9.4	121	0.29	-1.3
			Max	9.01	2033	158	461	253	190	191	1.69	nd	31	60	423	10	25	291	10.79	7.7
2	BHATHINDA	29	Min	8.08	230	0	40	7	0	1.1	0.03	0.02	0	7.0	7	2.4	4.5	51	0.30	-57.5
			Max	9.46	8308	343	1121	2084	1435	359	4.3	0.05	65	690	1200	760	28	2920	33.33	24.9
3	FARIDKOT	9	Min	8.63	535	40	54	14	12	6.2	0.25	0.02	4.1	15	59	4.1	13	71	1.84	-5.0
			Max	9.36	5260	145	564	574	1450	95	3.25	0.04	69	84	1200	116	32	439	28.03	10.8
4	FATEHGARH SAHIB	9	Min	7.12	513	0	311	21	3	0	0.13	nd	35	29	24.0	5.8	14	206	0.67	-14.1
			Max	8.14	2600	0	837	400	270	150	1.18	0.398	129	188	113	531	27	1098	2.47	9.6
5	FIROZEPUR	24	Min	8.15	393	0	0	14	28	0	0.07	nd	0	0	8.1	2	4.9	31	0.32	-18.4
			Max	9.25	8415	198	631	1524	2092	340	3.8	0.05	86	228	1750	245	26	1062	44.82	13.7
6	GURDASPUR	28	Min	7	198	0	54	6.9	0	0	0	0.01	17	5.1	2.2	0.7	8	105	0.09	-2.5
			Max	8.65	2155	66	658	174	80	225	1.72	0.9	84	51	285	305	35	368	11.53	10.7
7	HOSHIARPUR	17	Min	7.22	290	0	169	3.5	0	0	0.05	nd	21	6.4	12	0.9	12	122	0.31	-1.7
			Max	8.23	1268	0	495	71	59	147	0.48	0.15	93	55	120	14	35	375	3.20	1.6
8	JALANDHAR	14	Min	7.02	457	0	212	8.9	7.2	0	0.28	nd	11	9.0	10	1.5	14	64	0.30	-4.6
			Max	8.79	1288	59	544	252	88	61	3.1	0.012	95	67	195	18	29	406	7.04	4.5
9	KAPURTHALA	7	Min	8.1	405	0	148	6.9	0	0	0.07	0.03	13	15	34	1.9	19	147	0.91	-1.6
			Max	8.8	733	53	510	83	172	10	0.4	0.25	80	56	95	8.6	28	263	2.72	3.7
10	LUDHIANA	20	Min	7.51	384	0	175	7.1	8.4	1.3	0.06	nd	8.4	19	12	4.4	9.8	137	0.41	-8.8
			Max	8.9	3100	77	635	532	284	275	1.08	0.02	93	182	375	110	30	776	7.23	6.0
11	MANSA	13	Min	8.54	699	46	200	29	5.3	2.9	0.28	nd	5.8	5.9	61.0	4.5	7.5	58	1.67	0.3
			Max	9.20	4890	250	688	644	1000	293	7.46	nd	21	79	1092	191	18	379	26.69	12.2
12	MOGA	7	Min	8.85	465	40	81	11	15	0	0.16	0.02	8.2	7.4	31	2.5	11	51	1.00	-1.0
			Max	9.2	915	92	322	71	118	22	0.81	0.03	20	37	200	8	26	204	12.18	5.3
12	MUKTSAR	8	Min	7.9	326	0	94	14	0	1.6	0.32	0.01	4.1	15	16	4.3	9.0	133	0.60	-15.3
			Max	9.25	5712	119	550	1049	1835	675	4.9	0.04	245	253	940	390	25	1215	16.00	4.7
14	NAWANSHAHR	6	Min	7.27	453	0	266	5.3	3.2	0.03	0.22	nd	15	22	15	2.1	12	190	0.42	-0.5
			Max	8.22	724	0	435	60	31	33	0.5	nd	57	42	60	11	26	275	1.60	1.8
15	PATIALA	19	Min	8.42	258	6.6	107	7.2	0	0	0.24	nd	7.8	13	6.7	3	7.4	112	0.23	-2.6
			Max	9.12	2750	151	548	470	600	29	0.98	nd	31	98	518	158	23	451	14.33	9.7
16	ROPAR	16	Min	7.19	420	0	149	14	1.0	0	0.08	nd	24	17	5.8	0.3	14	186	0.17	-8.4
			Max	8.5	1758	71	646	246	165	117	1.1	0.41	71	114	249	89	28	627	6.31	5.3
17	SANGRUR	13	Min	8.26	485	0	160	11	0	0	0.17	nd	3.9	19	27	4.3	15	107	0.69	-16.7
			Max	9.23	4594	210	641	871	658	467	2.52	nd	35	238	715	58	24	1068	19.22	15.4
18	SAS Nagar	11	Min	7.2	651	0	227	28	0	0.03	0.18	nd	35	7.1	59	0.9	18	137	1.28	-9.0
			Max	8.19	3422	0	849	435	600	256	2.07	2.59	137	219	399	85	25	1078	5.87	6.5
19	Tarantaran	10	Min	7.55	440	0	228	10	0	0	0.07	0.01	13	15	65	4.2	14	95	2.51	2.2
			Max	8.55	1775	79	792	160	78	55	1.85	0.05	42	36	335	10	30	252	11.61	9.0
	TOTAL	276	Min	7	198	0	37	3.5	0	0	0	0.01	0	0	2.2	0.3	4.49	31	0.09	-57.5
			Max	9.46	8415	343	1121	2084	2092	675	7.46	2.59	245	690	1750	760	35	2920	44.82	24.9

4.2 Distribution of EC

The EC value of ground waters in the State varies from 198 to 8415 µS/cm at 25°C. Grouping water samples based on EC values, it is found that 40.2 % of them have EC less than 750, 51% have between 750 and 3000 and the remaining 8.7% of the samples have EC above 3000µS/cm. The Plate showing aerial distribution of EC with intervals corresponding to limits assigned for desirable, permissible and unsuitable classes of waters indicates that desirable class of waters occur in northern and central area of the State. The ground water occurring in the southern and southwestern parts comprising of Bhatinda Faridkot Ferozepur, Ludhiana, Mansa, Muktsar and Sangrur districts is mostly saline and not suitable for drinking uses (Fig 19).

Fig 19

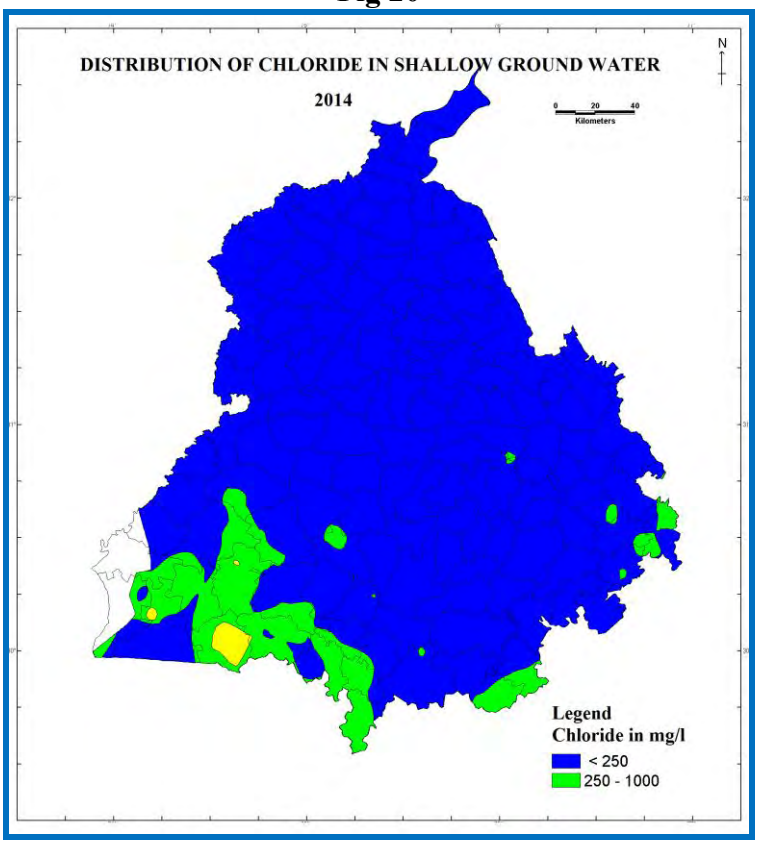


4.3 Distribution of Chloride (Cl)

Chloride content of ground water normally follows the distribution pattern of EC and it ranges from 3.5 mg/L to 2084 mg/L in the entire State. Chloride concentration above 400 mg/L gives salty taste to water and based on these aesthetic considerations, BIS has recommended a desirable limit of 250 mg/L for chloride in drinking water. This limit can be extended to 1000 mg/L in case of absence of a source with desirable concentration. Grouping of samples in these categories based on chloride content, it is found that Chloride is less than 250 mg/L in 86 % of the samples, between 250 and 1000 mg/L in 12.7% samples and only 1.4% of the samples are

found to have Chloride above 1000 mg/L. Map showing spatial distribution of Cl contents in ground water (Fig 20) indicates that Cl is below 250 mg/L in most of the districts, it is between 250 and 1000 mg/L in Patiala district and in southern and southwestern districts of the State. Cl is more than 1000 mg/L in isolated places in Bathinda, Ferozepur and Muktsar districts.

Fig 20

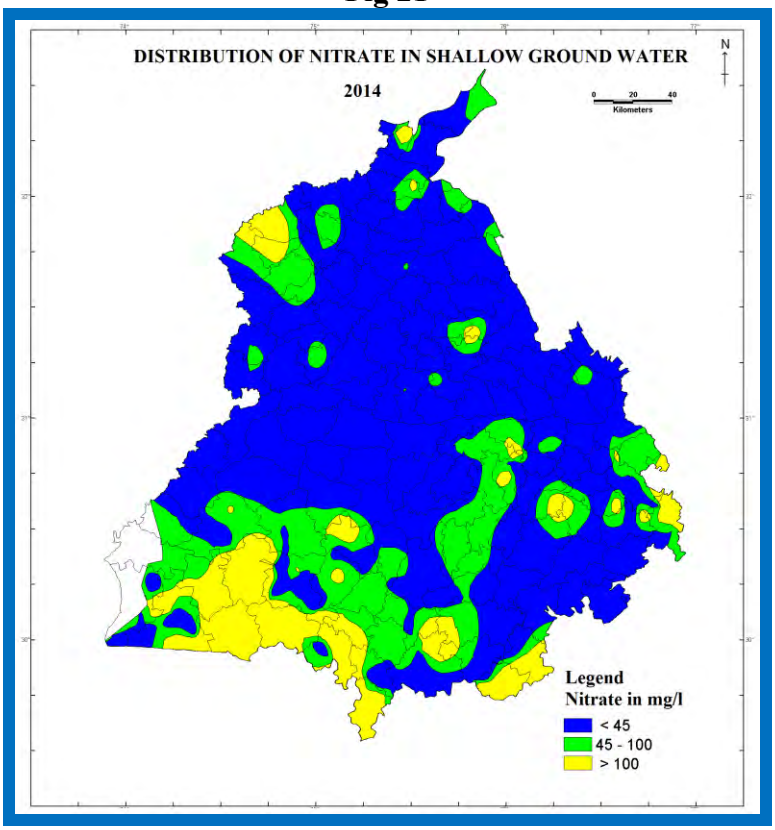


4.4 Distribution of Nitrate (NO_3)

Occurrence of nitrate in ground water above 5.0 mg/L reflects contamination at some stage of its percolation and circulation. The probable sources of nitrate contamination of ground water are through excessive application of fertilizers, bacterial nitrification of organic nitrogen, and seepage from animal and human wastes and atmospheric inputs. In the State, nitrate in water samples varies from traces to 675 mg/L. BIS permits a maximum concentration of 45 mg/L nitrate in drinking water. Considering this limit, it is found that 74% of the samples, spread over the entire State, have nitrate below 45 and 15.8% have more than 45 mg/L. Spatial distribution of nitrate indicates that ground water with permissible nitrate content generally occurs in the northern and central parts with a few isolated patches with nitrate above 45mg/L. A considerable area of the southern and southwestern part of the state have nitrate concentration exceeding 45 mg/L (Fig 21). Furthermore, quite a significant number water samples from Amritsar,

Gurdaspur, Bhatinda, Ludhiana, Fatehgarh sahib, Ferozepur, Mansa, Muktsar and SAS nagar districts are found to have nitrate above 100 mg/L.

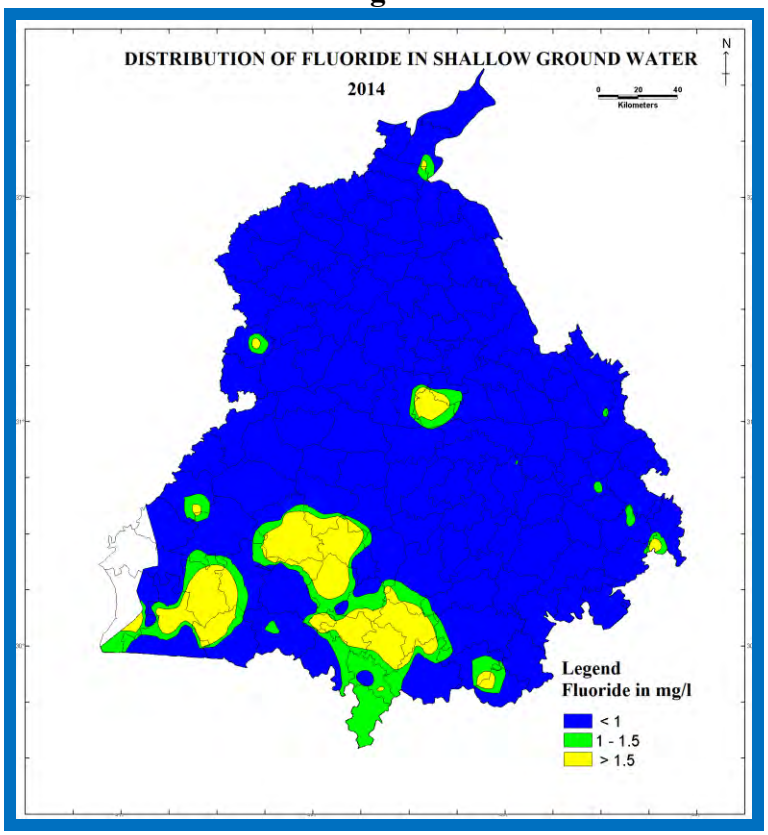
Fig 21



4.5 Distribution of Fluoride (F)

Fluoride in small amounts in drinking water is beneficial while in large amounts it is injurious. The fluoride content in ground water ranges from nil to 7.46 mg/L. BIS recommends that fluoride concentration up to 1.0 mg/L in drinking water is desirable, up to 1.5 mg/L is permitted and above 1.5 mg/L is injurious. Classification of samples based on this recommendation, it is found that 84% samples have fluoride in desirable range, 5.4% in the permissible and the remaining 10.5% have fluoride above 1.5 mg/L. Map showing spatial distribution of fluoride contents in ground water (Fig 22) indicates that ground water in most parts of the State has desirable concentration of fluoride. Ground waters with fluoride above 1.5 mg/L are found mainly in Bathinda, Faridkot, Ferozepur, Mansa, Muktsar and Sangrur districts of the State. It is worth mentioning that high fluoride waters are encountered in areas where agriculture activities are predominant. It indicates the possibility that fluoride has come from the phosphatic fertilizers, which have fluoride as impurity.

Fig 22



4.6 **Type of Ground water**

Considering the predominance of the cation and anion in the chemical composition of ground water, its type is determined and its relation with its occurrence in an area as well as with its salinity is studied. It is found that no discernible relationship between type of water and its occurrence in any particular area could be established. Nearly all types of waters are available in each district of the State. However, study of relation of water type with salinity of the water clearly indicates that nearly 45% ground waters of the State are fresh, have low salinity and predominance of calcium + magnesium cations and bicarbonate as anion. About 50 % ground waters having intermediate salinity and are of mixed type. In these waters, mostly HCO_3 as anion dominates but no individual cation predominates. At some places HCO_3-type of waters with sodium as dominant cation are also encountered in low to moderately saline ground waters. This can be attributed either to precipitation of $CaCO_3$ due to loss of CO_2 or dissolution of Na-salts from the topsoil layers or to ion exchange reaction during the downward percolation of water. At some isolated locations, sulphate is found to be dominant anion. In the remaining ground waters, where salinity is high; mostly Na is the dominant cation and Cl or Cl + SO_4+NO_3 (Mixed anion) are dominant. Nevertheless, a few exceptions have also been found in these simple and well-defined types of ground waters.

4.7 Suitability of Groundwater for Drinking

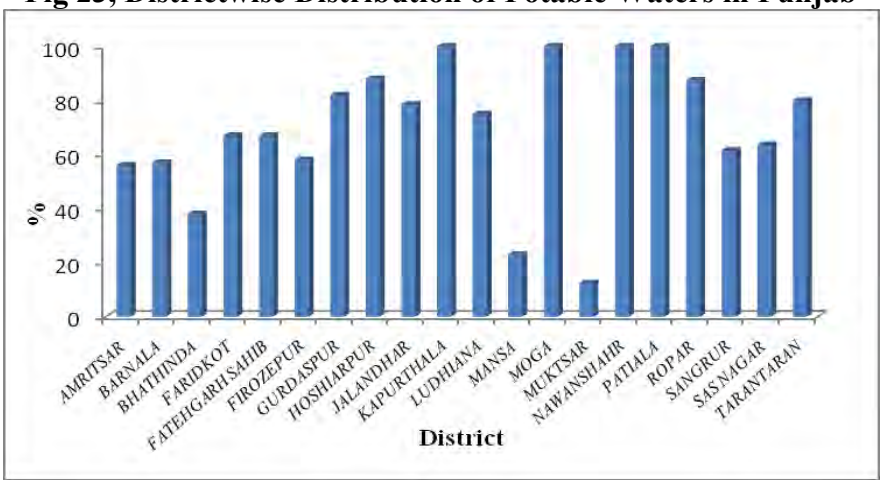
Salinity, chloride, fluoride and nitrate are the important parameters that are normally considered for evaluating the suitability of ground water for drinking uses. Based on recommendations made for these parameters by BIS, it is found that ground water at quite a few places is not suitable for drinking uses because of either EC/Cl/F/NO_3 or all of them. It is observed that unsuitable quality of ground water occurs in the southern and southwestern regions, while in the northern and central areas ground water is of suitable quality for drinking uses. Table-2 below shows district-wise distribution of ground waters in different classes of suitability based upon EC, Cl, F and NO_3 contents. District-wise availability of potable ground waters is also shown as bar diagram in Fig. 23.

Table-2:Distribution of Well Waters of Punjab State in Different Classes of Drinking Water Suitability

S.	District	EC in 25^0C in µS/cm			Cl in mg/L			NO_3 in mg/L			F in mg/L		
		<750	750-3000	>3000	<250	250-1000	>1000	<45	45-100	>100	<1.0	1.0-1.5	>1.5
1	AMRITSAR	4	5	0	9	0	0	5	3	1	9	0	0
2	BARNALA	2	5	0	6	1	0	5	1	1	6	0	1
3	BHATHINDA	6	14	9	16	12	1	13	4	12	22	3	4
4	FARIDKOT	1	7	1	7	2	0	8	1	0	6	0	3
5	FATEHGARH SAHIB	4	5	0	8	1	0	6	1	2	8	1	0
6	FIROZEPUR	4	15	5	18	4	2	18	1	5	18	0	6
7	GURDASPUR	20	8	0	28	0	0	24	2	2	27	0	1
8	HOSHIARPUR	12	5	0	17	0	0	14	2	1	17	0	0
9	JALANDHAR	7	7	0	13	1	0	11	3	0	12	1	1
10	KAPURTHALA	7	0	0	7	0	0	7	0	0	7	0	0
11	LUDHIANA	12	7	1	19	1	0	14	4	2	19	1	0
12	MANSA	1	10	2	9	4	0	7	4	2	2	4	7
13	MOGA	3	4	0	7	0	0	7	0	0	7	0	0
14	MUKTSAR	1	4	3	4	3	1	1	1	6	4	2	2
15	NAWANSHAHR	6	0	0	6	0	0	6	0	0	6	0	0
16	PATIALA	6	13	0	17	2	0	19	0	0	19	0	0
17	ROPAR	9	7	0	16	0	0	14	1	1	15	1	0
18	SANGRUR	3	8	2	11	2	0	8	4	1	11	0	2
19	SAS Nagar	1	9	1	9	2	0	8	1	2	8	2	1
20	Tarantaran	2	8	0	10	0	0	9	1	0	9	0	1
	TOTAL:276	111	141	24	237	35	4	204	34	38	232	15	29

The bar diagram clearly shows that most of the groundwater occurring in the districts Gurdaspur, Hoshiarpur, Jallandhar, Ludhiana, Kapurthala, Moga, Nawanshar, Patiala, Ropar and Tarantaran occupy almost 75% length of the bar and has almost all the parameters within desirable limit for drinking purposes, thus can be considered as potable. Ground waters from the districts of Bhatinda, Mansa and Muktsar have bar length less than 50% indicating low potable rating.

Fig 23, Districtwise Distribution of Potable Waters in Punjab



4.8 Suitability of Groundwater for Irrigation

The suitability of ground water for irrigation is generally assessed considering salinity expressed as EC, sodium in relation to calcium and magnesium in terms of SAR, sodium in relation to carbonate in terms of RSC. EC and SAR range from 198 to 8415 µS/cm at 25^0C and 0.09 to 44.82 respectively. Waters having high values of EC and SAR causes salinity and sodium hazards respectively when used for customary irrigation.

USSL: Plot of USSL diagram based on EC and SAR, it is observed that ground water occurring in the northern and central parts of the State falls under C_2S_1 and C_3S_1 classes of irrigation waters. It indicates that most of these waters are suitable for irrigating semi-salt tolerant crops on all soils. Ground water mostly from the southern and southwestern parts comprising of Bhatinda, Faridkot, Ferozepur, Mansa, Moga, Muktsar, Patiala and Sangrur districts falls under C_3S_2,C_3S_3, C_3S_4, C_4S_1, C_4S_2, C_4S_3 and C_4S_4 classes of irrigation classification. Such waters when used continuously for irrigation, they are likely to cause salinity hazards and lead to reduction in crop yields. They may also cause sodium hazards and lead to hardening of soils when used for irrigation without the addition of adequate quantity of gypsum.

RSC: Alkali hazards of irrigation ground waters are estimated through the computation of Residual Sodium Carbonate (RSC), also known as Eaton's Index. Waters with RSC value <1.25 meq/L are safe for irrigational uses, RSC between 1.25 and 2.5 are marginal and waters with RSC value >2.5 meq/L are unsafe. Based on RSC values of ground waters, it is found that 54.7% of the waters are safe, 10.9% marginal and the remaining 34.4% are unfit for irrigational uses. RSC of ground waters are found to vary from below zero (-57.46) to 13.69 meq/l. However, exceptionally high RSC values, 15.39, 16.76 and 24.90, are also encountered at Bhojowali in district Sangur, Lahri and Gurusar in district Bhatinda, respectively.

The district wise distribution of ground waters in different categories of suitability for irrigational uses based on USSL and RSC considerations is given in Table-3.

Table No.3 : Irrigation Rating of Well Waters of Punjab
(Based on Eaton's index and USSL Classification)

S. No.	District	IRRIGATION SUITABILITY			
		EATON's INDEX (RSC in meq/L)			*USSL Classification*
		Safe <1.25	Marginal 1.25-2.5	Unsafe >2.5	
1	AMRITSAR	5	3	1	C2S1, C3S1,C3S2
	BARNALA	4	0	3	C2S1,C3S1,C3S2
2	BHATHINDA	18	0	11	C1S1, C2S1, C3S1, C4S1, C3S2, C4S2 C4S4 C2S3, C3S3
3	FARIDKOT	3	1	5	C2S1, C3S2, C3S2, C3S4, C4S4
4	FATEHGARH SAHIB	5	2	2	C2S1, C3S1,C4S1
5	FIROZEPUR	15	3	6	C2S1,C3S1,C3S2,C3S3, C4S1,
6	GURDASPUR	20	3	5	C1S1,C2S1, C3S1, C3S3
7	HOSHIARPUR	13	4	0	C2S1,C3S1
8	JALANDHAR	6	1	7	C2S1, C3S1, C2S2,C3S2
9	KAPURTHALA	4	2	1	C2S1
10	LUDHIANA	15	3	2	C2S1, C3S1,C3S2,C4S2
11	MANSA	2	0	11	C2S1, C3S1, C3S2, C3S2, C3S3, C4S3, C4S4
12	MOGA	2	0	5	C2S1, C2S2,C3S1, C3S2,C3S3
13	MUKTSAR	7	0	1	C2S1, C3S1, C3S2, C4S1, C4S3,C4S4
14	NAWANSHAHR	5	1	0	C2S1
15	PATIALA	7	4	8	C2S1, C3S1,C3S2,C3S3,C4S1,C4S2 C4S3, C4S4
16	ROPAR	11	2	3	C2S1, C3S1,C3S2
17	SANGRUR	4	0	9	C2S1,C3S1,C3S2, C3S3,C4S3
18	SAS NAGAR	5	0	6	C2S1,C3S1,C3S2
19	TARANTARAN	0	1	9	C2S1,C3S1,C3S2, C3S3
	TOTAL 276	151	30	95	

Most of ground waters from Amritsar, Fatehgarh Sahib, Gurdaspur, Hoshiarpur, Jallandhar, Kapurthala and Ropar are suitable for irrigation for semi-salt tolerant crops on adequately drained soils. The waters from districts of Bhatinda, Faridkot, Ferozepur, Mansa, Muktsar, Patiala and Sangrur show wide variability in irrigation rating.

4.9 Suitability of Groundwater for Industries

Industries, in general, use water for variety of works depending upon the nature and size of the industry. As such specifications for suitability of water for industries vary widely depending upon the process in each industry. Therefore, chemical quality of water and its suitability could not be discussed due to diversified nature of industries.

4.10 Temporal Variation

The temporal changes in ground water quality are studied through percent of well water falling in different categories of suitability criteria based on concentration of important parameters such as salinity (EC), chloride, nitrate and fluoride contents. The percent well waters falling in desirable, permissible and unsuitable classes of BIS-1991 standards during 2014 are compared with percent well waters in same classes during 2010, 2011,2012 & 2013. Table 4 shows both positive and negative change in percent well waters in different suitability classes based on above parameters and overall variation in % wells from 2010 to 2014.

On perusal of the Table-4, it is evident that there is deterioration in the quality of ground water from 2013 to 2014 with respect to Specific conductance as there decrease by 13% in samples falling in low salinity category while there is an increase in samples falling in medium (11%) and high(2%) salinity categories. There has also been an increase in concentration of Chloride and Fluoride indicating a deterioration by 4% and 3%, respectively, in ground water quality with reference to these parameters. **Not much significant change is observed during the two consecutive years but there is some deterioration in chemical quality of ground water of the state as there is increase in percentage of wells falling above permissible class by 2%and 4% respectively. Deterioration of ground water quality by 3% is observed with to Fluoride. The cause of deterioration of ground water quality may be anthropogenic as no natural source for salinity and fluoride is found the state.**

Similarly there is a slight deterioration (by 1%) in ground water quality with respect to Nitrate. However, when percent samples are compared with those of 2010, it is found that there is considerable improvement in water quality with respect Cl, F and NO3to as indicated by percent increase of water samples falling in desirable class. However, salinity has slightly increased during this period as depicted by percent increase of samples with high Specific conductance.

Table 4: Periodic Variation in Suitability Classes of Well Waters of Punjab

Parameter	Class	% of Samples					Periodic Variation 2010-2014
		2010 (n=231)	2011 (n=231)	2012 (n=242)	2013 (n=261)	2014 (n=276)	
Salinity as EC	<750 µS/cm	39	44	44	53	40	+1
	750--3000	55	51	48	40	51	-4
	>3000	6	6	8	7	9	+3
Chloride as Cl	<250 mg/l	81	82	89	90	86	+5
	250 - 1000	18	17	10	9.5	13	-5
	>1000 mg/l	1	1	1	1	1	0
Nitrate as NO_3	< 45 mg/l	65	82	74	75	74	+9
	> 45 mg/l	35	18	26	25	26	-9
Fluoride as F	<1.0 mg/l	78	79	85	87	84	+6
	1.0 - 1.50	10	8	4	6	5	-5
	>1.50 mg/l	12	13	11	7	11	-1

4.11 Conclusion & Recommendations on Groundwater Quality

Conclusion drawn for quality evaluations of ground water and its suitability for various uses is based on macro level studies through monitoring stations sampled during 2010. It can be concluded that in Punjab

- Ground water is generally suitable for drinking uses except at few places in the southern and south western parts where it is not suitable due to high EC or high fluoride or nitrate or combination of all.
- Almost all waters are suitable for irrigation on well-drained soils for growing salt tolerant crops like wheat, mustard, rice, barley and maize etc. However, at few places where EC of ground water goes beyond 5000 μS/cm and SAR is more than 10, such waters are not suitable for customary irrigation.
- It is recommended that areas identified with unsuitable or marginally suitable water quality should be monitored on micro level to effectively delineate such areas and use suitable management measures.

5.0 CHANDIGARH

5.1 Composition and Quality of Ground Water

Quality of shallow ground water of Chandigarh is evaluated through two samples collected during May 2014 and no specific treatment such as acidification or filtration was given at the time of sampling. Samples were analyzed for major cations (Ca, Mg, Na, K) and anions (CO_3, HCO_3, Cl, NO_3, SO_4) in addition to pH, EC, F, TH as $CaCO_3$, Si as SiO_2 and PO_4 in the Regional Chemical Laboratory at Chandigarh as per APHA 2012 standard analytical procedures

The results of chemical analysis of ground water sample (Appendix-I) reveals that it is alkaline in nature with pH from 7.44 to 8.15 and is low to moderate mineralized with EC ranging from 650 to 1188 μS/cm. at 25^0C. Among anions, carbonate ion is found to be absent whereas bicarbonate concentration ranges from 335 to 589 mg/L. The chloride values range from 35 to 70mg/l, while the sulphate values vary from 23 to 44mg/l. Nitrate concentrations are found to range between 2.9 to be 22 mg/l. The Fluoride content is low and maximum concentration is 0.52 mg/L which is below the desirable limit of 1.0 mg/L. Among cations, sodium is the predominant cation and has a highest concentration of 48 mg/L. The other cations such as calcium and magnesium are present in low concentration and their highest

values are 43 mg/L and 71 mg/. The maximum potassium concentration reported is 113 mg/L. Total hardness of water sample expressed as $CaCO_3$ is found to range between 245 and 402 mg/L.

The perusal of chemical analysis data indicates that ground water is Mg-Na-HCO_3, and Mg-K-HCO_3 type. The ground water is suitable for domestic use as Salinity, chloride, nitrate and fluoride are within respective BIS(2012) permissible limit for drinking water. However, high potassium has been observed in well water of Burail village (113 mg/l) indicating contamination of ground water from point (industry, sewage) or/and non-point sources (agriculture). All other parameters are within the permissible limits of drinking water quality standards prescribed by BIS-2012.

The suitability of groundwater for irrigational uses is determined by considering the values of salinity (EC), sodium adsorption ratio (SAR) and residual sodium carbonate (RSC). Based on highest reported values for EC (1188 µS/cm.), SAR (1.33) and RSC (1.67), it can be concluded that groundwater of Chandigarh is suitable for irrigation in well drained soils. The USSL classification of irrigation waters indicates that it falls in C_2S_1 class and can be used for customary irrigation.

5.2 Temporal Variation

On comparison with chemical data of GWMS 2013, it is observed that water quality in terms salinity has deteriorated as indicated by its increase of EC from 815 to 1188 µS/cm. There has been no significant change in Chloride and Fluoride concentration during this period. There has been an increase in potassium concentration from 104 mg/l in 2013 to 113 mg/l in 2014.

5.3 Conclusion & Recommendation

Conclusion drawn for quality evaluations of ground water and its suitability for various uses is based on macro level studies through monitoring stations sampled during 2014. It can be concluded that in Chandigarh

- Ground water is generally suitable for drinking uses
- All waters are suitable for irrigation purposes**.**

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Annexure-I

S. No.	District	GWOW LOCATION	DEPTH TO WATER LEVEL (m)			
			May 2014	August 2014	November 2014	January 2015
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Chandigarh	BURAIL	2.92	2.62	2.79	2.47
2.		Csio-combined	20.87	21.04	23.57	21.69
3.		CSIO-S	20.74	21.03	20.84	20.88
4.		MaloyaPZM	8.31	9.51	9.56	9.04
5.		NEW INDUST AREA	22.94	21.36	22.84	22.39
6.		Sec-27, Ar Well	44.41	38.71	37.88	40.86
7.		Sec-27, Cgwb Building		88.21		
8.		SECT 10C (D)	25.72	26.60	26.28	26.35
9.		SECT 10C (S)	15.13	13.48	15.61	13.73
10.		SECT 21D (S)	9.46			7.78
11.		SECT 31D (D)	17.67	17.86	18.33	18.33
12.		SECT 31D (S)	10.79	4.66	11.41	10.36
13.		SECT 37D (S)	4.31	4.21	4.76	3.96
14.		SECT 39D (S)	4.47	4.42	5.15	4.36
15.		SECT 44D (S)	2.80		3.15	2.97
16.		Sector 52- PZ	14.25	17.91	18.10	14.70
17.		Sector-46 (shallow)	6.40		6.72	
18.	Amritsar	Aima Khurd-Pz	12.90	13.64	12.30	
19.		Ajnala	11.19	12.36	11.40	11.09
20.		Aminshah Khalra	9.49		10.62	11.16
21.		Amritsar1	24.17	25.40	23.86	26.30
22.		Attari-Pz	16.50	17.18	15.90	16.32
23.		Bahla-Pz			18.94	
24.		Bakipur-Pz	20.05	20.18	17.50	19.40
25.		Bal Kalan-Pz	17.00	17.30	18.92	17.50
26.		Bath-Pz	20.08	20.10	13.21	19.36
27.		Beas07	14.25	14.49	7.80	14.32
28.		Bhagala-Pz	8.36	9.04	12.26	8.30
29.		Bhagwanpur-Pz	13.09	13.62	19.05	12.70
30.		Bhalaipur-Pz	19.96	20.05	12.94	19.40
31.		Bhankar Kalan-Pz	14.04	14.06	13.00	13.20
32.		Bhattaywad-Pz	12.90	12.85	14.81	12.80
33.		Bhikiwind- Pz	14.28	16.05	11.84	15.00
34.		Bhura-Pz	13.38	13.26	15.24	12.30
35.		Bhure-Pz	16.10	16.25	13.60	15.65
36.		Bhusse-Pz	14.70	14.80	15.10	14.00

37.		Boparai Khurd-Pz	14.40	15.60	16.55	15.30
38.		Brahmpur-Pz	17.75	17.86	14.00	16.90
39.		Burjwal-Pz	15.10	15.30	18.25	14.40
40.		Chabal 07	17.58	18.30	10.10	18.60
41.		Chak Dogra-Pz	9.40	10.60	17.50	9.80
42.		Chakkare Khan-Pz	18.70	18.60	14.00	18.00
43.		Chobal Kalan-Pz	14.59	15.35	8.74	14.40
44.		ChogWan- Pz	9.95	12.75	16.87	9.25
45.		Chola Sahib-Pz	16.69	19.32	16.48	16.98
46.		Choudhary Wala-Pz	17.96	18.00	16.83	17.10
47.		Chuselawad-Pz	17.48	18.18	12.90	17.26
48.		Dhariwal-Pz	9.90	10.40	5.00	12.70
49.		Dholan-Pz	6.50	6.35	16.70	5.36
50.		Dhottian-Pz	17.49	18.10	15.90	17.05
51.		Dhulika-Pz	16.50	16.95	18.10	15.60
52.		Dohan-Pz	17.30	17.90	20.19	17.80
53.		Ekalgoda-Pz	21.12	21.30	4.91	20.60
54.		Gago Mahal- Pz	5.85	6.74	10.44	5.51
55.		Gandi Wind-Pz	10.29	11.98	19.40	10.81
56.		Gill wali-Pz	19.30	19.70	18.90	19.20
57.		Goindwal 07	19.46	19.94	8.10	19.50
58.		Gujjaran Wali-Pz	8.00	8.30	12.80	8.40
59.		Jandiala Guru-Pz	18.45	19.86	18.82	18.86
60.		Jandoke-Pz	18.21	17.25	16.00	16.50
61.		Jasrur-Pz	7.50	8.20	7.60	7.80
62.		Jethuwal-Pz	15.50	16.20	15.10	14.70
63.		Kalsia Kalan				
64.		Kalsia Kalan07	15.32	17.60		12.60
65.		Kandowali-Pz	12.70	13.10	12.80	8.50
66.		Karyal-Pz	9.10	9.40	8.80	18.31
67.		Khadur Sahib-Pz	17.78	18.78	18.35	12.50
68.		Khalra-Pz	12.40	13.00	12.22	15.30
69.		Khilchian-Pz	14.70	15.80	15.15	12.70
70.		Kotbudda-Pz	13.50	13.60	12.24	14.80
71.		Kotli Sur Singh-Pz	15.05	15.65	14.32	14.40
72.		Mahendipur-Pz	15.11	15.28	16.40	16.20
73.		Mahima-Pz	16.20	16.75	12.70	12.80
74.		Majitha- Pz	12.50	13.80	18.10	17.60
75.		Makhan Windi-Pz	18.00	18.50	16.90	17.30
76.		Marhona-Pz	18.10	18.25	6.67	7.09
77.		Mari Kamboke-Pz	8.26	8.06	6.70	6.50

78.		Mehleykey-Pz	5.75	6.60	11.38	11.95
79.		Mehta-Pz	12.40	15.30	14.80	17.50
80.		Miran Chak-Pz	15.60	16.90	17.80	14.21
81.		Mohawa	13.45	16.07	13.68	4.60
82.		Nangal Sahaul-Pz	5.20	5.70	4.80	10.63
83.		Nawan Tanal- Pz	10.29	12.31	9.98	8.00
84.		Pakharpura-Pz	8.60	8.90	8.00	16.96
85.		Pindan-Pz	17.26	17.40	16.60	5.80
86.		Rajoke-Pz	6.83	6.70	4.20	12.70
87.		Rampura-Pz	12.40	13.40	12.80	17.21
88.		Ratoke-Pz	16.65	23.17	17.33	13.40
89.		Rupowal Brahmana-Pz	12.50	13.50	13.70	18.80
90.		Sabran-Pz	19.70	19.60	18.30	19.15
91.		Sahab Pura- Pz	19.82	20.17	18.16	15.40
92.		Sathiala-Pz	15.80	16.30	15.10	10.10
93.		Shabura-Pz	9.60	10.30	9.90	7.10
94.		Sham Nagar-Pz	8.00	8.60	6.80	17.60
95.		Sheron-Pz	18.60	18.50	17.00	16.14
96.		Sugga-Pz	17.05	16.80	15.70	18.50
97.		Talwandi Dogra-Pz	17.10	18.60	18.50	16.20
98.		Tarsika-Pz	16.00	16.80	16.20	18.40
99.		Thatha- Pz	18.90	19.40	18.00	14.50
100.		Ugar Aulakh-Pz	14.70	14.90	14.10	14.70
101.		Vadala Kalan-Pz	14.90	15.60	14.50	12.92
102.		Wachhoya-Pz			12.68	
103.		Wandala Bittewad-Pz	14.80	15.90	14.90	15.20
104.	Bathinda	Ablu	9.00	12.58	11.49	12.88
105.		Aleke Jalal-Pz	21.66	24.30	24.80	23.90
106.		Badiala-Pz	24.94	28.29	27.83	26.28
107.		Bagher Mohabat Singh-Pz	8.30	8.65	8.69	8.28
108.		Bahman Jassa Singh-Pz				
109.		Bahman Kaur Singh-Pz	9.15	9.25	9.53	9.20
110.		Balianwali-Pz	18.40	24.10	23.50	22.10
111.		Balluana1	4.27	4.91	4.55	4.83
112.		Balluana-Pz	5.47	6.63	6.38	6.28
113.		Banbhiha-Pz	4.55	4.54	4.75	4.40
114.		Bandi-Pz	6.74			
115.		Bhagibandar	8.03	8.69	8.28	8.23
116.		Bugran-Pz	23.10	28.40	27.80	26.60
117.		Burj Gill-Pz	20.05	22.80	22.90	21.31
118.		Burj-Pz	9.51	8.96	9.35	9.17

119.		Deratapp	5.93	6.39	5.80	5.23
120.		Dhapali1	18.95	20.37	20.53	21.13
121.		Dhapali-Pz	19.60	22.31	21.75	20.17
122.		Dialpur Mirza	21.70	24.00	23.07	22.00
123.		Dialpura Bhlaike	22.40	24.83	24.13	23.63
124.		Dulle Wala-Pz	25.65	28.50	28.08	27.53
125.		Ganga-Pz	13.55	15.15	17.79	
126.		Ghudda	3.51		2.89	
127.		Ghudda-Pz	9.75			
128.		Gill Patti-DW	7.45	7.92	7.90	7.74
129.		Gulabgarh 1 (vs)				
130.		Gulabgarh 2 (s)	12.25	14.80	12.89	12.55
131.		Gumti-DW	22.45	23.94	24.51	23.60
132.		Guru Sar-Pz	8.20	13.90	8.58	8.82
133.		Gurusar				
134.		Harraipur-Pz	15.94	16.95	16.72	16.10
135.		Jajjal	7.34	7.55	7.39	7.54
136.		Jassi Bhagwali	6.67	7.37	6.43	6.77
137.		Jassi Paowali-Pz	7.16	7.60	7.72	7.39
138.		Jhanduke	19.29	22.89	22.32	
139.		Jhanduke-Pz	19.30	22.80	21.55	20.09
140.		Kahan Singh Wala-DW	15.40	16.90	16.82	16.31
141.		Kalla Bandar	5.70	6.40	6.07	
142.		Kalyan Sukha-Pz	19.30	22.15	21.70	20.97
143.		Koir Singh Wala-Pz	20.35	23.00	23.60	22.19
144.		Kot Bhaktu-Pz	5.10	5.40	5.40	5.08
145.		Kot Fatta	10.90	12.80	12.75	12.31
146.		Kot Guru	6.08	6.35	6.50	5.70
147.		Kot Shamir	14.15	20.76	13.86	12.77
148.		Kothaguru-Pz	20.92	22.18	22.25	21.78
149.		Lahri	8.44			
150.		Lalliana-Pz	6.17	6.82	6.70	6.85
151.		Lehra Dhulkot-Pz	17.15	19.98	20.88	19.60
152.		Lehra Khanna-Dw	16.30	17.70	18.70	18.30
153.		Maihma Bhagwan-PZ	10.53			10.12
154.		Maisar Khana	12.52	13.81	13.03	
155.		Maisar Khana-Pz	13.96	13.65	13.52	13.40
156.		Maluka-Pz	17.90	20.46	20.20	19.74
157.		Mandi Kalan-Pz	19.80	24.70	25.07	23.92
158.		Mehraj-Pz	16.94	19.55	19.49	18.92
159.		Mehta-Pz	7.24	6.80	6.78	6.70

160.		Multania-Pz	6.46	6.75	6.65	6.08
161.		Nahinwala	9.64	10.32	10.85	10.70
162.		Nathana-Pz	16.70	21.65	19.05	17.91
163.		Nathena-Pz	5.69	5.90	5.58	5.27
164.		Phul	21.10	22.60	23.20	23.18
165.		Phulla				
166.		Phulla1	14.09	16.90	16.73	16.23
167.		Puhla-Pz	17.00	18.25	18.60	17.63
168.		Raike Kalan	1.56	3.56	2.24	1.96
169.		Rajgarh Kubey-Pz	9.50	7.85	7.85	7.90
170.		Rampura	23.69	24.00	24.40	24.66
171.		Rayya-Pz	21.75	25.40	24.30	23.80
172.		Salabatpur-Pz	25.90	29.15	28.70	28.15
173.		Sangat -Pz	6.33	7.23	7.02	6.96
174.		Seema-DW	14.70	17.00	15.95	15.28
175.		Sidhana		20.12	20.79	19.74
176.		Sooch-Pz	16.95	19.80	19.25	18.95
177.		Teona-Pz		5.42	5.48	5.52
178.		Tungwali-Pz	14.05	16.20	15.28	14.90
179.	Faridkot	Bead Sikhanwala- Pz	8.59	10.59	8.35	8.36
180.		Behabal Kalan-Pz	10.60	12.50	11.90	11.00
181.		Burj Jawahar Singh-Pz	15.40	17.50	17.40	16.20
182.		Chahd Baja	14.95	17.44	16.40	15.57
183.		Chak Kalan-Pz	2.70	1.70	2.10	2.50
184.		Devrana-Pz	2.35	1.50	2.20	2.55
185.		Dhaipai-Pz	7.65	7.40	7.20	7.70
186.		Dhilwan Kalan	7.75	9.20	10.00	8.00
187.		Dhudi-Pz	11.80	13.70	12.20	12.25
188.		Dipsinghwala	4.35	4.15	3.55	4.00
189.		Faridkot-Pz	4.30	4.33	3.70	3.90
190.		Fatehgarh-Pz	15.40	17.15	16.95	16.10
191.		Ghuiana-Pz	5.20	6.25	4.85	4.80
192.		Karirwali	7.89	9.30	8.67	10.23
193.		Kauni-Pz				
194.		Koharwala- DW	7.20	6.90		7.50
195.		Kot Kapura	9.60	8.12	7.48	6.83
196.		Matta	8.80	9.25	8.22	7.33
197.		Mehmuana	1.60	2.10	1.26	1.34
198.		Pahluwala-Pz	3.90	4.40	3.60	3.30
199.		Ratti Rori-Pz	1.75	1.45	1.02	1.30
200.		Rorian Kapura-Pz	9.10	8.90	8.40	9.20

201.		Sandhwan-Pz	6.05	7.05	6.00	5.45
202.		Sher Singh Wala- Pz	1.95	3.70	3.23	3.13
203.	Fateh Garh	Alipur Sodhian-Pz	16.70			
204.		Amloh1	23.70			
205.		Badalialasingh	32.26		35.88	35.79
206.		Bagga Kalan	20.55	21.9	22.25	22.55
207.		Balpur				
208.		Bassi Pathana	17.09	20.69	21.05	15.67
209.		Bhagrana	5.23	5.92	5.25	5.38
210.		Bhateri1	29.12	31.41	31.42	30.82
211.		Burj	15.90	17.35	17.65	17.4
212.		Chandiala-Pz	16.70			
213.		Chunni Kalan	14.82	15.35	16.15	16.3
214.		Fatehgarh Sahib	18.90	18.90	19.25	18.9
215.		Fatehgarh Sahib-Pz	19.00	20.28	20.45	19.82
216.		Jai Singh Wala	13.85	15.55	16.75	16.85
217.		Jhambela	19.40	20.85	21.45	21.1
218.		Khara	23.20		25.5	25.1
219.		Lohar Majra	18.95	20.30	20.95	20.75
220.		Mianpur-Pz	18.60			
221.		Nalini-Pz	18.70	21.15	20.15	20.02
222.		Nandpur Kalaur-Pz	28.40			
223.		Pawala	11.20	12.71	13.32	13.15
224.		Sado Majra	16.35	17.60	17.9	17.9
225.		Shahpur	22.00	23.30	23.45	23.35
226.		Sirhind-Pz	19.90			
227.		Tahalpur	19.50	20.70	22.2	22.35
228.		Talwara	18.60	20.00	20.2	19.8
229.	Firozpur	Abohar	2.06	1.61	1.96	1.91
230.		Alamgarh	1.32	1.87	1.15	1.26
231.		Asifwala-Pz	6.91	7.15	7.13	6.92
232.		Baman Wali-Pz	12.80	13.13	13.15	12.40
233.		Bannawala	1.60	0.10	1.37	1.26
234.		Bara Mansur Wala-Pz	25.50	26.70	27.10	27.30
235.		Bazirdpura	8.72		8.48	8.37
236.		Chak Kala Tibba				
237.		Chak Kandhe Shah-Pz	10.30	12.55	12.30	10.30
238.		Chak Khere Wala-Pz	6.80		12.23	
239.		Chak Pune Wala-Pz	11.70	11.98		11.15
240.		Chamb-Pz	17.50	18.95	19.45	18.20
241.		Danewal Satkosi	3.10	3.48	4.27	4.19

242.		Danger Khera-Pz	2.10	2.83	2.80	2.71
243.		Dipulana-Pz	5.55	5.75	4.41	
244.		Dulchi Ke-Pz	8.42	9.10	8.50	8.20
245.		Fattu Wala-Pz	18.97	19.80	21.80	19.95
246.		Fazilka-Pz	9.78	10.27	10.20	10.12
247.		Ghananga Kalan-Pz	3.98	4.30	3.58	3.99
248.		Giddran Wali-Pz	2.78		2.90	2.81
249.		Godiwala-Pz	3.15	3.88	3.88	3.75
250.		Gogiani-Pz	17.30	18.92	19.03	17.25
251.		Guru Harsahai-Pz	5.80	6.50		
252.		Hamed Saidoke-Pz	14.93	15.70	16.35	14.50
253.		Himmatpura-Pz	6.05	6.75	6.70	6.50
254.		Jaimal Singhwala Pz	8.45	9.93	8.75	8.63
255.		Jaimal wala-Pz	9.10	10.18	9.50	8.90
256.		Jand Wala Johian-Pz	4.50	4.50	3.20	3.85
257.		Jandwala M Sagla-Pz	6.01	6.25	4.92	4.88
258.		Jandwala Watan-Pz	2.73	2.80	1.45	2.40
259.		Jang-Pz	8.00	8.80	8.50	8.20
260.		Jhottian Wali-Pz	6.01	6.30		
261.		Jodhe Wala Bhaini-Pz	12.85	13.30	14.62	12.70
262.		Kahan Singh Wala-Pz	1.90	1.90	1.27	2.35
263.		Kaler Khera-Pz	3.95	4.46	4.40	4.30
264.		Kandh Wala-Pz	3.91	3.65	3.63	3.55
265.		Kathgarh-Pz	13.30	14.70	13.30	12.60
266.		Khan Wala-Pz	4.35	4.52	4.45	4.35
267.		Khere Ki Uttar-Pz	16.51	18.10	18.10	16.60
268.		Khuiansarwar- Pz	1.15	0.90	0.75	0.71
269.		Kundal1	0.45	0.90	-0.04	0.12
270.		Ladhuwala	1.68	0.25	0.89	1.30
271.		Lauhke Kalan- Pz	16.40	20.49	18.85	17.40
272.		Lohere Khurd-Pz	18.55	19.80	20.19	19.20
273.		Machi Bugra/ Gujran-Pz	12.45		14.70	13.10
274.		Mallanwala Khas-Pz	11.90	12.90	12.95	12.10
275.		Malluwala-Pz	21.80	24.20	24.20	23.15
276.		Malsian-Pz	9.70	11.88	10.24	10.00
277.		Malukpur-Pz	1.21	1.58	1.60	1.42
278.		Mana Singh Wala-Pz	4.30	5.00	3.55	4.20
279.		Markhiwa Bhamni-Pz	5.80	5.89	5.88	5.76
280.		Mohkam Khan Wala-Pz	12.00	14.81	13.50	12.85
281.		Mohre Wala-Pz	6.55	9.22	7.13	6.78
282.		Motiwala 07pz	10.41			

283.		Mudki-Pz	10.85	11.30	11.41	10.80
284.		Mullian Wali-Pz	2.25	2.40	2.38	2.25
285.		Muradwala Dal-Pz	1.16	1.81	1.84	1.68
286.		Nihalkhera	1.64	2.81	1.45	1.54
287.		Nure-Ki-Uttar 07pz	14.73	16.40	15.04	14.61
288.		Pancha Wali-Pz	11.06	11.24	11.34	11.30
289.		Pattiwalla-Pz	3.26	3.32	3.25	3.18
290.		Piyarana	4.03	4.56	3.99	4.15
291.		Rala Hazi- Pz	6.90	7.80	6.45	6.70
292.		Ramsara-Pz	3.11	3.72	3.60	3.49
293.		Roran Wala-pz	3.00	3.40	3.48	3.53
294.		Rukne Wala-Pz	7.60	9.00	8.53	8.65
295.		Sadhusha Wala-Pz	11.80	13.30	12.10	11.78
296.		Sham Singhwala-Pz	4.50	4.60	3.86	3.77
297.		Shatriwala-Pz	3.55	3.82	3.75	3.65
298.		Sherewala-Pz	7.91	8.50	8.55	8.45
299.		Singhpura-Pz	2.55	2.79	2.80	2.70
300.		Sitoganno	2.52	2.53	2.09	2.13
301.		Sohangarh Ratte	2.18	2.29	1.91	2.13
302.		Sultan Khan Wala Urf-Pz	10.00			
303.		Swah Wala- Pz	8.95	9.90	8.55	8.47
304.		Talwandi Jalle Khan-pz	26.45	27.70	28.17	27.30
305.		Tibbi Kalan-Pz	9.98	11.20	10.70	10.10
306.		Tibbi Taiwan Laluwalla-Pz	3.85	4.40	4.05	4.40
307.		Wage Wala-Pz	9.10	10.39	10.40	9.90
308.		Waryam Khera			3.54	3.59
309.	Gurdaspur	Aulakhkalan	18.65		19.44	19.16
310.		Bamyal	5.14	4.92	4.83	4.87
311.		Bhagowal	7.28	7.40	4.32	6.88
312.		Bham	13.89	15.02	13.02	12.92
313.		Bhoa	4.36	3.34	4.11	4.14
314.		Bilasbal-Pz	16.10	16.70	16.40	15.90
315.		Chahal Kalan-Pz	8.00	8.60	8.50	8.20
316.		Chahgill-Pz	8.90	9.50	9.50	9.10
317.		Chone-Pz	10.65	11.10	11.20	10.90
318.		Dakoha-Pz	12.76	14.47	13.21	13.11
319.		Dera Baba Nanak	5.62	6.22	5.19	4.61
320.		Dhandoi-Pz				
321.		Dhar Khurd	2.30	2.80	2.90	2.50
322.		Dhianpur	14.69		13.58	14.65
323.		Dinanagar	4.05	3.56	2.76	3.78

324.		Dostpur-Pz	3.70	4.80	4.70	4.30
325.		Gajikort-Pz	4.60	5.15	5.20	5.00
326.		Galri	4.81	4.40	5.56	4.95
327.		Ghania Ki bangar- Pz	7.04	8.35	6.88	6.95
328.		Gharotakalan	6.88		6.09	6.47
329.		Ghoh				9.65
330.		Ghoh DW	8.65	7.80	7.63	
331.		Ghumani Khurd-Pz	6.10	6.65	6.50	6.20
332.		Gurdaspur-Pz	8.10	8.70	8.70	8.30
333.		Harchowal-Pz	14.20	14.70	14.70	14.40
334.		Hargobindpur	18.51	15.11	18.31	18.30
335.		Hassanpur Kalan-Pz	8.60		9.20	9.00
336.		Jandwala	19.90	27.30	26.90	26.40
337.		Jhakolahri	3.03	2.35	2.52	2.49
338.		Jhandalbana-Pz	2.80	3.70	3.70	3.30
339.		Kala Afgana-Pz	7.50	8.35	8.40	8.00
340.		Kalanaur-DW	10.42	10.98	11.09	11.13
341.		Kalanaur-Pz	3.55	6.01	3.86	4.08
342.		Kalerkalan-Pz	2.90	3.70	3.60	3.40
343.		Kaure-Pz	13.50	14.20	14.30	13.90
344.		Khanikhui	1.95	1.33		1.61
345.		Khanmalik-Pz	8.80	9.25	9.90	9.50
346.		Khatgarh-Pz	3.50	4.05	4.30	3.90
347.		Kiari- DW				5.25
348.		Kui-DW				4.50
349.		Lakankala-Pz	2.60	3.90	4.00	3.70
350.		Langurwal-Pz	7.50	8.15	8.20	8.00
351.		Madipur Fatehgarhchuria	8.47	11.35	9.66	9.58
352.		Malikpur	7.30			9.00
353.		Malikpur-Pz	8.70	9.30	9.40	6.10
354.		Mallewal-Pz	5.90	6.40	6.40	6.00
355.		Maman-Pz	5.65	6.20	6.30	4.25
356.		Masana-Pz	4.10	4.70	4.60	2.60
357.		Massit-Pz	2.50	3.10	2.80	3.60
358.		Mirthal-DW	4.00	4.50	5.00	4.70
359.		Mirza Jaan-Pz	8.70	9.20	9.30	9.00
360.		Mullowali 1(vs)	3.51	4.34	3.23	3.31
361.		Mullowali 2(m)	2.80	3.95		3.03
362.		Muthi	3.70	4.30	4.60	4.40
363.		Nangal-Pz	2.80	4.00	4.00	3.70
364.		Narot Jaimalsingh-Pz	5.10	4.20	4.70	4.60

365.		Nawan Pind	5.76	3.06	5.73	6.01
366.		Nishayara	4.53	5.88	4.32	4.47
367.		Pandoritalab	2.46	0.58	2.46	2.45
368.		Paniar	6.60			6.90
369.		Parcha-Pz	5.65	6.25	6.30	6.00
370.		Parmota-DW				8.50
371.		Pathankot1	6.02	5.50	4.71	4.95
372.		Patti Atwal-Pz	10.80	4.70		
373.		Phulpiara	4.20		5.00	4.70
374.		Quaddian -Pz				
375.		Saidowal Kalan-DW		4.20	4.11	4.07
376.		Saleh Chak-S	2.59	3.63	8.48	2.96
377.		Salehchak(vs)	3.14	3.53		3.36
378.		Sarna				9.16
379.		Sarna1	10.14	5.54		
380.		Sathial-Pz	12.41	11.90		10.99
381.		Shahpur Jattan-Pz	4.20	4.65	4.70	4.50
382.		Shahpur-Pz	3.25	3.85	3.80	3.50
383.		Shezada Kalan-Pz	4.75	5.90	5.90	5.50
384.		Shikar-Pz	7.90	8.40	8.60	8.40
385.		Sohal	11.50			11.70
386.		Tikriwala-Pz	7.50	8.25	8.00	7.60
387.	Hoshiarpur	Adowal Garhi-Pz	16.29	17.34	18.31	17.01
388.		Argowal-Pz	18.60			
389.		Badla-Pz	20.40	22.35	23	22.55
390.		Bagpur-Pz	8.53			
391.		Baichan-Pz	17.00	19.3	19.7	19.5
392.		Bajwara	15.80		15.8	17.4
393.		Bajwara-Pz	13.70	15.25	15.8	
394.		Bhalowal Gujjran-Pz	33.00			
395.		Bhamnaur	15.12		15.27	16.48
396.		Bhanowal-Pz	10.85			
397.		Bhatolian-Pz	18.40			
398.		Bhangala-Chhota-DW			4.6	
399.		Budhi Pind-Pz	13.45	15.1	15.55	15.35
400.		Chak Sheru-DW			3.24	
401.		Chohal	3.94	3.8	3.85	1.69
402.		Dadan-Pz	32.60			
403.		Dallewal-Pz	12.20			
404.		DAGAN-DW			11.69	
405.		Dasuya2 (s)	6.90			7.48

406.		Dharampur1	1.54			3.24
407.		Durimiwal	3.72	4.66	3.88	4.05
408.		Fattowal-Pz	21.15	22.6	23.80	23.55
409.		Garh Di Wala-Pz	12.77	15.11	12.38	11.25
410.		Garhshankar (s)	21.51		23.00	22.28
411.		Grahaya-Pz	17.15	19.3	19.85	19.55
412.		Haler Rampur-DW			3.03	
413.		Hazipur	8.38	8.32	8.02	8.32
414.		Ittian-Pz	6.40			
415.		Jalalpur-Pz	3.55	5.4	5.65	5.4
416.		Jattpur-Pz	11.70	13.3	13.70	13.3
417.		Jhir Da Khuh-DW			5.73	
418.		Khera-Pz	40.60	42.85	43.00	42.8
419.		Mahil Baltohian-Pz	29.20	30.85	31.25	31
420.		Mahilpur-Pz	19.19	19.53	19.75	19.7
421.		Mianipur-Pz	3.80	5	5.20	4.95
422.		Mukerian Dw	2.98			3.03
423.		Naharpur-Pz	2.30			
424.		Nangal Bihala- DW	10.69	13.58	11.80	11.25
425.		Nangal Thathal-Pz	16.10	18.15	18.60	18.4
426.		Pan Khuh-DW			4.20	
427.		Pandori Mehal-Pz	19.10	21.35	21.60	21.4
428.		Parshote-Pz	19.50	21.4	21.75	21.55
429.		Phuglana- Pz	24.56	27.2	24.96	22.57
430.		Rampur Colony (HSP) pz-medium	19.76		19.33	18.06
431.		Samraj Tanda-DW			4.26	
432.		Sham Chaurasi	11.76	12.14	12.07	12.07
433.		Sibo Chak- DW			8.03	
434.		Simbli- OW	15.61	20.92	17.53	15.51
435.		Simbli-Pz	14.82	18.02	17.36	14.57
436.		Talwara1	11.76	9.5	11.62	12
437.		Tanda				4.4
438.		Thakarwala	10.67	10.91	11.26	10.43
439.	Jalandhar	Adampur 3(s)	8.08	8.90	7.43	5.81
440.		Adarman-Pz	16.80	18.20	18.30	17.90
441.		Akalpur-Pz	16.90	18.40	16.70	16.30
442.		Allawalpur	6.48	8.30	7.15	9.04
443.		Bilga-Pz	17.80	20.20	19.80	19.10
444.		Billi Chahrami-Pz	29.75	32.10	31.50	29.85
445.		Chania-Pz	21.40	24.70	21.60	21.40
446.		Dhanda-Pz	29.60	30.30	30.50	30.20

447.		Dhirowal-Pz	7.30	8.60	8.40	7.90
448.		Fateh Jalal-Pz	23.40	26.60	23.50	22.85
449.		Gehlan-pz	14.45	15.80	15.80	15.30
450.		Gillian-Pz	32.70	35.30	35.20	34.90
451.		Gohiran			31.89	30.14
452.		Hardo Pharwal-Pz	25.30	27.70	26.00	25.50
453.		Hardo Sheikh-Pz	27.40	29.70	28.50	28.00
454.		Jalandhar 3(vs)	33.15		35.02	
455.		Jalbhe	11.33			
456.		Jandiala-Pz	25.85	27.75	27.63	27.03
457.		Jandu Singha-Pz	22.90	26.30	26.20	25.90
458.		Janian-Pz	22.50	24.40	24.60	24.15
459.		Kakar Kalan-Pz	17.60		18.40	17.80
460.		Kala-Pz	20.80	22.20	21.80	21.60
461.		Kalyanpur-Pz	30.75	31.40	31.10	31.15
462.		Kang Sahib Rai-Pz	28.40	30.40	30.10	29.90
463.		Kartarpur 2(s)	18.76	18.24	16.77	17.02
464.		Kharal Kalan Pz-S	12.99	15.52	13.83	13.18
465.		Kot Wadal Khan-Pz	20.70	22.40	21.60	21.40
466.		Kurla-Pz	18.60	20.50	19.70	19.00
467.		Lallian kalan Pz-S	31.45	33.84	33.85	32.78
468.		Mahmuwal-Pz	28.90	30.40	30.30	30.10
469.		Mehsampur-Pz	18.80	20.30	19.70	19.45
470.		Nakodar 2(m)	28.76	31.64	31.14	30.83
471.		Nakodar 3(s)	28.86	32.14	31.73	28.64
472.		Nangal Shaman	28.50	30.50	29.40	29.20
473.		Nasirpur-Pz	8.00	9.50	9.00	8.80
474.		Nussi-Pz	26.50	29.60	27.40	25.90
475.		Pathial-Pz	12.50	14.40	14.60	14.00
476.		Pharwala-Pz	20.50	22.10	21.20	20.60
477.		Phillaur 2(s)	15.66	15.87	15.72	15.60
478.		Rahimpur-Pz		27.10	24.70	24.20
479.		Rurka Kalan- Pz	19.60	23.20	21.80	21.60
480.		Samarahi-Pz	17.50	19.50	18.80	18.40
481.		Sarih Pz-S	26.44	27.65		
482.		Shahkot(s)	25.90		28.11	
483.		Shahkot-Pz-Pb	15.20			
484.		Skarar Pur-Pz	20.30	23.20	20.20	19.40
485.		Sultanpur-Pz	19.70	17.30	16.60	16.00
486.		Talwandi Bhutial-Pz	20.00	22.70	22.30	21.90
487.		Talwani Madho-Pz				

488.		Talwan-Pz	18.50	19.60	18.80	18.60
489.		Thanda-Pz	18.00	23.50	22.40	22.25
490.		Udhopur			7.68	8.05
491.	Kapurthala	Amanipur-Pz	10.15	14.75	11.25	10.95
492.		Balera-Pz	26.10	31.80	29.40	28.35
493.		Bauril Harnampur-Pz	11.84	14.76	13.14	12.59
494.		Begowal-Pz	5.52	7.30	5.50	5.18
495.		Bhanoki-Pz	22.50	26.25	24.30	23.70
496.		Bhatnura Khurd- S	12.83	17.12	13.69	10.12
497.		Bhawanipur-Pz	8.60	12.00	9.60	8.10
498.		Bholath M	7.41	9.41	8.04	7.68
499.		Bholath S	7.85	9.32	8.63	8.04
500.		Chakoke-Pz	5.39	7.29	5.64	5.14
501.		Dadwindi-Pz	17.60			
502.		Dalla	19.50		21.37	20.00
503.		Hamira-Pz	9.54	10.12	9.45	9.24
504.		Hazipur-Pz	5.14	8.64	5.44	5.14
505.		Hussainpura-S Pz		24.38	19.93	
506.		Hussainpura-VS Pz		24.30	19.70	
507.		Kapurthala2 (s)	19.09	21.15	19.38	19.77
508.		Karnail Ganju-Pz	6.56	7.91	7.26	6.56
509.		Kishanpur	20.65	29.05	24.45	22.25
510.		Maheru-Pz	17.60	22.70	21.15	21.30
511.		Miani Bola-Pz	8.41	9.59	8.61	8.31
512.		Mithra-Pz	12.40	15.70	13.40	12.70
513.		Nadala	6.12	6.70	6.00	5.85
514.		Nathu Chahal-Pz	25.80	32.79	29.29	27.49
515.		Nurpur Janoa-Pz	8.08	9.12	8.48	8.08
516.		Paazian-Pz	15.85	22.25	17.20	15.70
517.		Phagwara2 (s)	24.05	28.33	26.92	25.39
518.		Phulewal-Pz	15.00	16.80	15.20	15.00
519.		Rawalpindi-Pz	17.35	26.95	21.35	18.85
520.		Saiflabad-Pz	7.45	8.95	8.15	7.90
521.		Sangatpur-Pz	17.70	26.50	21.20	18.50
522.		Shalapur Dona-Pz	25.40	31.60	27.50	26.70
523.		Sheikh Manga-Pz	2.90	5.47	3.90	3.90
524.		Sultanpur2 (s)	13.43	17.03	15.13	14.60
525.		Talwandi Chaudary -Pz	9.04	11.73	9.73	9.50
526.		Thikriwali-Pz	7.65	8.40	8.00	7.42
527.	Ludhiana	Alamgir-Pz	18.21	19.35	19.15	18.77
528.		Aliwal-Pz	6.57	9.16	8.20	8.15

529.		Badowal				10.10
530.		Begowal	9.73	10.58	10.20	
531.		Bhagwanpur-Pz	14.38	14.75	15.50	15.30
532.		Bhahlolpur-DW		13.31	12.43	12.35
533.		Bharthala Randhawa-Pz	20.03	23.50	22.30	21.85
534.		Bhikhi Khatron-Pz	11.74	12.36	12.93	12.93
535.		Bilaspur-Pz	8.05	9.45	8.87	9.00
536.		Chaminala-Pz	19.55	21.70	20.60	19.90
537.		Chankian Khurd-Pz	6.80	9.04	7.32	7.50
538.		Chattar Singh Park-ldh	40.42		7.40	
539.		Chaunta-Pz	5.68	6.10	22.80	7.37
540.		Chhapar-Pz	20.83	23.18	19.80	22.25
541.		Dinnamder-Pz	17.52	20.55	19.45	19.50
542.		Dodpur-Pz	17.92	18.42	6.49	19.34
543.		Doraha-Pz	7.28	6.57		6.18
544.		Galibkalan-Pz	19.12	24.60	23.30	22.05
545.		Gohaur-Pz	20.51	23.25	21.15	20.85
546.		Gopalpur 2(s)	15.73		18.02	17.50
547.		Habbowal	20.49			
548.		Hambowal-Pz	5.88	6.32	7.10	7.10
549.		Harnampur	17.53	21.13	19.78	18.23
550.		Hedon-Pz	17.29	17.68	18.60	18.69
551.		Ikloha-Pz	20.57	21.62	21.38	21.26
552.		Kadon-Pz	10.32	19.00	19.12	
553.		Kalsian	24.65	26.85	27.35	26.75
554.		Katanikalan-Pz	9.15	9.40	8.80	8.95
555.		Khandur	19.49	21.24	20.89	20.34
556.		Kishangarh-Pz	17.70	20.70	19.60	19.00
557.		Kishanpur-Pz	22.90	26.00	26.32	24.95
558.		Lalan1	9.57	10.33	10.67	10.77
559.		Lelon-Pz	4.68	4.92	5.32	5.12
560.		Lil- II Pz	16.09		16.23	16.35
561.		Lil-Pz III	12.93		13.05	13.07
562.		Lodhiwal-Pz	9.60	11.50	10.10	10.04
563.		Lohara-Pz	26.50	28.80	27.90	27.80
564.		Ludhiana 3(vs)				
565.		Maksudra-Pz	9.64	10.82	10.37	10.13
566.		Manak Majra-Pz	19.50	22.35	21.90	21.20
567.		Mangat-Pz	9.79	10.33	11.38	11.49
568.		Manoke-Pz	23.75	25.92	26.60	25.85
569.		Mehma Singh Wala-Pz	18.51			

570.		Mehma-Pz	18.51	20.90	20.20	
571.		Mushkabad	12.56		12.56	12.33
572.		Nurpur-Pz	24.43	26.85	26.50	26.30
573.		P.A.U.Ludhiana 2(s)	25.59	26.55	26.63	25.88
574.		Pabbian-Pz	15.85	18.09	16.15	15.40
575.		Pandori-Pz	18.16	21.95	19.70	19.15
576.		Payal-Pz	15.30	17.25	16.40	16.05
577.		Punjeta	10.28	10.40	10.00	10.60
578.		Ragba-Pz	17.00	19.58	18.85	18.20
579.		Raikot-Pz	23.40	28.40	26.30	24.65
580.		Rajona Khurd	22.28	25.30	24.98	24.13
581.		Rashiana-Pz	20.15	23.05	22.55	21.95
582.		Rashin	23.21	25.66	25.68	24.98
583.		Rattewal-Pz	19.87	22.97	22.16	21.63
584.		Roomi-Pz	20.67	27.00	24.65	22.30
585.		Sajaywal-Pz	19.90	26.60	23.45	20.75
586.		Samrala 2(s)	13.82		14.08	13.45
587.		Sanewal-Pz	14.56	15.90	15.65	15.50
588.		Sangatpura-Pz	18.07	19.10	20.18	20.28
589.		Sherian	3.71	4.33		4.14
590.		Sherpur-Pz	3.82	4.17	4.72	4.42
591.		Sidhwan Bet-Pz	8.01	7.73	7.26	7.36
592.		Talwandi Kalan-Pz	15.98	18.70	17.70	17.10
593.		Udonwal-Pz	3.38	3.70	4.38	4.15
594.		Upplan	8.82	9.12	10.18	10.00
595.		Utlan	11.38	12.65		
596.	Mansa	Adamke-Pz	12.29	12.97	12.80	12.21
597.		Aklia-Pz	17.45			
598.		Alampur Mandran-Pz	9.45			
599.		Alisher Khurd-Pz	11.35			
600.		Bahadur Pur-Pz	13.23			
601.		Bareh-Pz	10.80			
602.		Behniwala-Pz	7.35			
603.		Bhamme Kalan-Pz	6.08			
604.		Bhikhi 1 (s)		15.54	15.48	15.4
605.		Bhikhi 2 (s)	14.52			
606.		Budhlada	11.96	12.41	7.78	
607.		Budhlada-Pz		14.20	13.16	13.01
608.		Burj Bhalaike	3.92	3.97	2.17	3.88
609.		Burj Rathi-Pz	12.10			
610.		Fattamaluka	4.79	5.63	5.43	5.4

611.		Gehlan-Pz	5.70	6.99	6.82	6.32
612.		Gharangne-Pz	6.80			
613.		Hera Wala-Pz	9.25			
614.		Hero Kalan-Pz	22.87			
615.		Hirke-Pz	17.39			
616.		Jatana Kalan-Pz	5.33	5.87	5.94	5.67
617.		Jhanda Khurd Pz				
618.		Khiala Kalan-Pz	9.45			
619.		Khokhar Kalan-Pz	7.80			
620.		Kot Dhamru	7.27	7.9	7.35	7.24
621.		Kotra	10.40	8.17		
622.		Kusla-Pz	3.05			
623.		Lakhiwal-Pz	17.20			
624.		Mansa				8.7
625.		Phaphare Bhaike-Pz	14.25			
626.		Raipur-Pz	7.54	8.7	8.29	
627.		Ralla	9.35			10.01
628.		Tandian-Pz	8.14			
629.	Moga	Baje Ke-Pz	18.81	18.30	16.53	14.77
630.		Baraghar-Pz	20.10	22.40	22.50	21.40
631.		Budh Singh Wala-Pz	19.19	21.55	21.19	20.45
632.		Chogawan-Pz	28.92	32.01		30.91
633.		Dagru- Pz	29.48	32.15	32.10	31.37
634.		Damru Khurd	17.27	20.80	20.43	19.90
635.		Darapur	22.60		26.55	
636.		Darapur 07pz	24.15	24.80	26.55	27.73
637.		Daulatpur Niwan-Pz	26.10	27.95	28.00	26.80
638.		Ghoha Khurd-Pz	17.10	18.80		17.90
639.		Himatpura-Pz	27.30	29.35	29.40	27.90
640.		Indergarh-Pz	16.90	31.60		
641.		Jhandewala-Pz	29.10	26.80	31.35	30.10
642.		Khokri Kalan-Pz	24.50	27.35	27.5	26.20
643.		Khosa Randhir-Pz	27.15			
644.		Khosakotta-Pz	26.35			
645.		Mandar-Pz	8.10			
646.		Mangewala-Pz	20.70	23.1	23.3	21.95
647.		Nathu Wala-Pz	19.50			
648.		Nihalsinghwala-Pz	28.60	31.04		30.52
649.		Raonke Kalan-Pz	22.50	28	28.2	26.90
650.		Samad Bhai-Pz	18.54			
651.		Samal Sari			17.50	

652.		Samalsar-Pz	16.00	17.4		15.10
653.		Thathe Bhai-Pz	17.00			
654.		Tota Singh Wala-Pz	8.65			
655.	Muktsar	Abulkharana	0.92			
656.		Abulkharana-Pz	1.99	2.11	2.18	2.01
657.		Alam Wala	2.42	3.39	2.32	1.99
658.		Assa Butter-Pz	4.10	4.55	4.58	4.40
659.		Balocha Khera(rasoolpur)	1.38	2.75	1.62	0.20
660.		Bariwala-Pz	1.70	1.30	1.10	1.25
661.		Bhaliana	7.83	8.90	8.72	8.50
662.		Bhamma(bam)				9.96
663.		Bhiti Wala-Pz	1.80	2.12	2.09	1.96
664.		Chaktam Kot-Pz	1.70	2.40	1.42	1.30
665.		Chotian-Pz	9.08	9.12	9.11	8.91
666.		Dhalkot-Pz	7.26	7.52	7.46	7.25
667.		Doda	2.62	1.32	2.68	
668.		Doda-Pz	2.72	2.95	2.37	3.00
669.		Gaga-Pz	1.34	1.58	1.62	1.49
670.		Husnar-Pz	3.50	3.62	3.54	3.41
671.		Jhabelwali-Pz				2.50
672.		Jhurar-Pz	2.40	3.13	2.80	3.60
673.		Kabar Wala	2.53	3.55		2.37
674.		Kattianwali-Pz	2.80	3.25	2.05	2.03
675.		Khirkian Wala-Pz	1.86	2.04	2.18	
676.		Khunde Halal-Pz	2.05	3.18	1.73	
677.		Killian Wali-Pz	6.72	6.78	6.85	6.75
678.		Kollian Wali-pz	1.45	1.55	1.20	1.33
679.		Kot Bhai- DW	5.25	5.35	5.37	5.27
680.		Kuttianwali	0.54	0.19	0.27	
681.		Labanianwali	2.66	3.62	2.59	2.35
682.		Lambi	0.70	1.33	0.74	2.10
683.		Lambi-Pz	1.58	2.59	2.35	3.66
684.		Muktsar	2.95	4.30	3.59	
685.		Murar Kalan-Pz				
686.		Phulu Khera-Pz	1.85	1.93	2.07	1.92
687.		Ratta Khera Chota-Pz	2.20	2.20	1.47	1.55
688.		Rupana-Pz				
689.		Sheikh-Pz	2.20	2.60	2.73	2.58
690.		Sohiwal-Pz	3.10	3.00	1.85	2.25
691.		Wadhai-Pz				
692.	Nawanshahr	Alowal-Pz	5.60	6.10	5.9	5.80

693.		Baharam-Pz	16.75	18.00		17.00
694.		Bahara-Pz	15.00	16.10	15.70	15.00
695.		Bahlora Kallan- Pz	5.59	5.37	4.99	4.95
696.		Bahua-Pz	20.10	21.70	21.40	20.70
697.		Balachore	19.20	18.30		18.13
698.		Hakimpur-Pz	15.50	15.90	16.00	
699.		Kariam-Pz	15.30	15.90	14.60	14.20
700.		Mauhra-Pz	31.53	31.40	31.90	31.06
701.		Rahon	9.73	9.30	9.41	9.37
702.		Raipur Dhaba-Pz	14.97	13.70	14.35	13.95
703.	Patiala	Antala	3.19	0.74	3.26	1.09
704.		Ballopur	4.50		4.15	3.50
705.		Banur 07pz	20.64	19.59	20.60	20.10
706.		Bassma Pipla	4.20			
707.		Bhankhar-Pz	26.50	27.5	27.50	
708.		Bhojo majri 07pz	22.12	22.4	22.70	22.81
709.		Binzal-Pz	25.45	25.9	25.90	25.65
710.		Birkauli	25.02	28.28	27.50	27.12
711.		Chandiala-Pz	21.35	22	22.80	22.80
712.		Chhat	8.05	6.55		5.65
713.		Dera Bassi 07pz	12.20	13.25	13.00	14.04
714.		Devigarh	29.70			
715.		Devigarh 1Pz	29.01		32.01	32.12
716.		Devigarh IIPz	29.00		31.75	31.79
717.		Devigarh-III Pz	29.29		31.85	31.67
718.		Dhakdaba 07	22.94	23.54	24.80	24.92
719.		Gholu majra 07pz				9.28
720.		Haluka	8.07	7.23	7.22	6.61
721.		Handesaran-s	13.45	14.65	18.34	
722.		Hari Majra	7.08			
723.		Harion Kalan-Pz	36.20	35.5	36.10	36.10
724.		Joli	6.00	5.5	5.60	5.65
725.		Kakrala-Pz	34.70	34.6	34.20	34.80
726.		Kalyan 07pz	23.05	24.55	26.07	23.67
727.		Kami Kalan	12.14		12.65	12.37
728.		Kulburcha-Pz	33.60	33.8	33.80	33.60
729.		Kutha Kheri-Pz	31.45	31.95	31.65	32.10
730.		Lacharu Kalan	4.79	5.26	5.57	5.51
731.		Lachkani-Pz	19.48	20.64	20.25	20.14
732.		Miranpur- Pz	28.30	30.81	30.90	31.17
733.		Mirapur				29.56

734.		Mirpur-Pz	4.65			
735.		Nanhera-Pz	23.30	24.2	23.90	23.50
736.		Nariana	11.35		12.85	
737.		Patran-Pz	36.90	37.24	36.69	
738.		Rajpura Pz M	28.30	30.65		
739.		Rajpura-PzSt		43.3	44.30	40.05
740.		Samana-Pz	31.29		32.60	32.45
741.		Samaspur-Pz	24.65	22.8	25.25	25.05
742.		Sangatpura-Pz	24.70		26.99	26.31
743.		Singhpura-Pz	24.30	25.1	25.30	25.25
744.		Sirsini	0.03	1.25	0.88	1.20
745.		Sundran-Pz	24.16			
746.		Thua	32.40	34.2	35.00	34.62
747.	Rupnagar	Ahmedpur	4.44	6.94	5.64	6.39
748.		Bera Chauta	3.69	4.13	4.45	3.58
749.		Bhalan	3.91	2.46	3.38	1.60
750.		Braham Pur	4.36	2.15	4.15	1.80
751.		Chakdera	4.53	3.60	4.67	3.55
752.		Chanalon	8.63		10.33	
753.		Chatamli- Pz	33.86	39.45	36.45	39.70
754.		Dhair	8.24	9.66	8.19	7.94
755.		Dheri	5.08	4.40		4.30
756.		Dumewal	11.88	9.98	11.45	9.63
757.		Dusarna	12.76			
758.		Gharoon	15.40	16.20	15.20	14.70
759.		Ghoga	5.33	4.88	4.53	4.58
760.		Hardinamoh	3.16	1.14	2.20	1.29
761.		Kakrali	19.81	19.66	19.56	
762.		Kurrha-Pz	17.35	17.90	17.35	17.05
763.		Landran	2.16			
764.		Landran-Pz	15.35		6.10	
765.		Malkpur-Pz	5.50	6.50	10.60	6.8
766.		Nurpurbedi				10.45
767.		Raipur Kalan	15.80	16.90	16.20	16.05
768.		Rurki Heeran-Pz	17.46	18.54	18.04	19.8
769.		Soara	4.01	4.80	5.16	4.6
770.	Sangrur	Bagarian-Pz	26.78	29.67	28.77	28.68
771.		Bapla-Pz	29.86	30.28		
772.		Barnala (s)	32.78	33.91	34.41	34.29
773.		Bhadaur-Pz	23.26	25.60	25.18	24.38
774.		Bhojowali-Pz	31.27	33.86	33.12	32.25

775.		Bugra 1	26.83	32.20	29.01	
776.		Chural Kalan M	23.42	24.32	25.51	25.66
777.		Dharamgarh-Pz	24.10	24.77	25.28	25.34
778.		Gahl 07pz	19.37		21.94	
779.		Gehlon-Pz	18.30	19.50	19.45	18.85
780.		Ghanauri Kalan-Pz	34.85	36.23	37.90	37.44
781.		Haryao-DW	15.09			
782.		Hassanpur-Pz	25.18	25.60	26.25	26.10
783.		Isra-Pz	25.38	25.56	26.00	25.82
784.		Kala Jhar-Pz	28.10	28.80	29.00	
785.		Kubbe-Pz				
786.		Kuler Khurd-Pz	28.97	29.33	30.87	31.37
787.		Kurar-Pz	32.20	35.50	35.80	33.70
788.		Ladda-Pz	28.97		31.12	30.96
789.		Lehal Kalan-Pz	23.76	24.10	24.92	24.78
790.		Lohgarh-Pz	24.84	26.40	26.40	25.40
791.		Longowal-Pz	24.60	25.99	25.99	25.89
792.		Mahal Kalan-Pz	27.33		30.40	29.02
793.		Malerkotla				
794.		Malerkotla-DW	32.30	33.12		
795.		Manvi-Pz		21.48		
796.		Mastuana-Pz	25.96	26.32	26.82	
797.		Mehsampur 07pz	30.03		31.80	
798.		Mehsampur-Pz	30.37	30.72		31.78
799.		Nangal-Pz	33.20	35.40	35.30	33.90
800.		Panjgaraian- Pz	32.79	33.15	34.85	34.95
801.		Ramgarh-Pz	20.40	21.30	21.20	20.40
802.		Rampur Channa-Pz	24.00	24.52	25.72	25.65
803.		Rurki Kalan-Pz	18.58	18.89	20.55	21.30
804.		Sunam-Pz	30.75	32.23	32.35	32.20
805.		Tappa Mandi-Pz	26.20	28.80	28.90	27.80
806.						

SEASONAL WATER LEVEL FLUCTUATION (m)						Annexure-II
S. No.	DISTRICT	GWOW LOCATION	JANUARY 2014-MAY 2014	MAY 2014-AUGUST 2014	MAY 2014-NOVEMBER 2014	MAY 2014-JANUARY 2014
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	CHANDIGARH	BURAIL	-0.13	-0.3	-0.13	-0.45
2.		Csio-combined	-0.2	0.17	2.7	0.82
3.		CSIO-S	-0.21	0.29	0.1	0.14
4.		MaloyaPZM	-1.09	1.2	1.25	0.73
5.		NEW INDUST AREA	-0.4	-1.58	-0.1	-0.55
6.		Sec-27, Ar Well	-5.68	-5.7	-6.53	-3.55
7.		SECT 10C (D)	2.23	0.88	0.56	0.63
8.		SECT 10C (S)	0.75	-1.65	0.48	-1.4
9.		SECT 21D (S)				-1.68
10.		SECT 31D (D)	-0.03	0.19	0.66	0.66
11.		SECT 31D (S)	0.04	-6.13	0.62	-0.43
12.		SECT 37D (S)	-1.95	-0.1	0.45	-0.35
13.		SECT 39D (S)	-0.32	-0.05	0.68	-0.11
14.		SECT 44D (S)	-0.21		0.35	0.17
15.		Sector 52- PZ	3.1	3.66	3.85	0.45
16.		Sector-46 (shallow)	0.15		0.32	
17.	AMRITSAR	Aima Khurd-Pz	-0.89	0.74	-0.6	
18.		Ajnala	0.33	1.17	0.21	-0.1
19.		Aminshah Khalra	0.34		1.13	1.67
20.		Amritsar1		1.23	-0.31	2.13
21.		Attari-Pz		0.68	-0.6	-0.18
22.		Bakipur-Pz	-0.91	0.13	-1.11	-0.65
23.		Bal Kalan-Pz	-1.5	0.3	0.5	0.5
24.		Bath-Pz	-0.8	0.02	-1.16	-0.72
25.		Beas07	-0.31	0.24	-1.04	0.07
26.		Bhagala-Pz	-0.96	0.68	-0.56	-0.06
27.		Bhagwanpur-Pz		0.53	-0.83	-0.39
28.		Bhalaipur-Pz	-0.96	0.09	-0.91	-0.56
29.		Bhankar Kalan-Pz	-0.86	0.02	-1.1	-0.84
30.		Bhattaywad-Pz	-0.5	-0.05	0.1	-0.1
31.		Bhikiwind- Pz	0.07	1.77	0.53	0.72
32.		Bhura-Pz	-1.03	-0.12	-1.54	-1.08
33.		Bhure-Pz	-0.9	0.15	-0.86	-0.45
34.		Bhusse-Pz	-0.84	0.1	-1.1	-0.7
35.		Boparai Khurd-Pz	0.65	1.2	0.7	0.9
36.		Brahmpur-Pz	-0.95	0.11	-1.2	-0.85

37.		Burjwal-Pz	-1.01	0.2	-1.1	-0.7
38.		Chabal 07	0.04	0.72	0.67	1.02
39.		Chak Dogra-Pz	0.3	1.2	0.7	0.4
40.		Chakkare Khan-Pz	-1	-0.1	-1.2	-0.7
41.		Chobal Kalan-Pz		0.76	-0.59	-0.19
42.		ChogWan- Pz	-1.1	2.8	-1.21	-0.7
43.		Chola Sahib-Pz	0.13	2.63	0.18	0.29
44.		Choudhary Wala-Pz	-0.86	0.04	-1.48	-0.86
45.		Chuselawad-Pz	-0.78	0.7	-0.65	-0.22
46.		Dhariwal-Pz	2.65	0.5	3	2.8
47.		Dholan-Pz	-0.95	-0.15	-1.5	-1.14
48.		Dhottian-Pz		0.61		-0.44
49.		Dhulika-Pz	-0.4	0.45	-0.6	-0.9
50.		Dohan-Pz	-0.1	0.6	0.8	0.5
51.		Ekalgoda-Pz	-0.82	0.18	-0.93	-0.52
52.		Gago Mahal- Pz	-0.1	0.89	-0.94	-0.34
53.		Gandi Wind-Pz	0.12	1.69	0.15	0.52
54.		Gill wali-Pz	-1.9	0.4	0.1	-0.1
55.		Goindwal 07	0.01	0.48	-0.56	0.04
56.		Gujjaran Wali-Pz	-0.5	0.3	0.1	0.4
57.		Jandiala Guru-Pz	0	1.41	0.37	0.41
58.		Jandoke-Pz	-0.93	-0.96	-2.21	-1.71
59.		Jasrur-Pz	0.2	0.7	0.1	0.3
60.		Jethuwal-Pz	-0.9	0.7	-0.4	-0.8
61.		Kalsia Kalan07	0.03	2.28		
62.		Kandowali-Pz	-0.6	0.4	0.1	-0.1
63.		Karyal-Pz	-1.6	0.3	-0.3	-0.6
64.		Khadur Sahib-Pz	0.05	1	0.57	0.53
65.		Khalra-Pz	-0.9	0.6	-0.18	0.1
66.		Khilchian-Pz	-0.5	1.1	0.45	0.6
67.		Kotbudda-Pz	-0.8	0.1	-1.26	-0.8
68.		Kotli Sur Singh-Pz	-0.86	0.6	-0.73	-0.25
69.		Mahendipur-Pz	-0.93	0.17		-0.71
70.		Mahima-Pz	0.2	0.55	0.2	0
71.		Majitha- Pz		1.3	0.2	0.3
72.		Makhan Windi-Pz	-1.7	0.5	0.1	-0.4
73.		Marhona-Pz	-0.94	0.15	-1.2	-0.8
74.		Mari Kamboke-Pz	-0.98	-0.2	-1.59	-1.17
75.		Mehleykey-Pz	5.45	0.85	0.95	0.75
76.		Mehta-Pz	-0.7	2.9	2.4	-0.45
77.		Miran Chak-Pz	0.1	1.3	2.2	1.9

78.		Mohawa	0.47	2.62	0.23	0.76
79.		Nangal Sahaul-Pz	0.4	0.5	-0.4	-0.6
80.		Nawan Tanal- Pz	0	2.02	-0.31	0.34
81.		Pakharpura-Pz	-1	0.3	-0.6	-0.6
82.		Pindan-Pz	-1.36	0.14	-0.66	-0.3
83.		Rajoke-Pz	-0.97	-0.13		-1.03
84.		Rampura-Pz	-1.5	1	0.4	0.3
85.		Ratoke-Pz	-0.03	6.52	0.68	0.56
86.		Rupowal Brahmana-Pz	0.25	1	1.2	0.9
87.		Sabran-Pz	-0.8	-0.1	-1.4	-0.9
88.		Sahab Pura- Pz	-1.95	0.35	-1.66	-0.67
89.		Sathiala-Pz	-1	0.5	-0.7	-0.4
90.		Shabura-Pz	3.2	0.7	0.3	0.5
91.		Sham Nagar-Pz	-0.6	0.6	-1.2	-0.9
92.		Sheron-Pz	-0.82	-0.1	-1.6	-1
93.		Sugga-Pz		-0.25	-1.35	-0.91
94.		Talwandi Dogra-Pz	-0.5	1.5	1.4	1.4
95.		Tarsika-Pz	-2.8	0.8	0.2	0.2
96.		Thatha- Pz	-1.02	0.5	-0.9	-0.5
97.		Ugar Aulakh-Pz	-6.4	0.2		
98.		Ugar Aulakh-Pz			-0.6	-0.2
99.		Vadala Kalan-Pz	-0.8	0.7	-0.4	-0.2
100.		Wandala Bittewad-Pz		1.1	0.1	0.4
101.	BATHINDA	Ablu	3.48	3.58	2.49	3.88
102.		Aleke Jalal-Pz		2.64	3.14	2.24
103.		Badiala-Pz	-0.05	3.35	2.89	1.34
104.		Bagher Mohabat Singh-Pz	-0.09	0.35	0.39	-0.02
105.		Bahman Kaur Singh-Pz	-0.06	0.1	0.38	0.05
106.		Balianwali-Pz	-0.17	5.7	5.1	3.7
107.		Balluana1	-0.44	0.64	0.28	0.56
108.		Balluana-Pz	-0.21	1.16	0.91	0.81
109.		Banbhiha-Pz	-0.13	-0.01	0.2	-0.15
110.		Bhagibandar	0.16	0.66	0.25	0.2
111.		Bugran-Pz	1.06	5.3	4.7	3.5
112.		Burj Gill-Pz	-0.2	2.75	2.85	1.26
113.		Burj-Pz	-0.18	-0.55	-0.16	-0.34
114.		Deratapp	-0.45	0.46	-0.13	-0.7
115.		Dhapali1	-0.23	1.42	1.58	2.18
116.		Dhapali-Pz	-0.23	2.71	2.15	0.57
117.		Dialpur Mirza	-1.1	2.3	1.37	0.3
118.		Dialpura Bhlaike	-0.16	2.43	1.73	1.23

119.		Dulle Wala-Pz	-0.08	2.85	2.43	1.88
120.		Ganga-Pz	-0.15	1.6	4.24	
121.		Ghudda	1.33		-0.62	
122.		Gill Patti-DW	-0.1	0.47	0.45	0.29
123.		Gulabgarh 2 (s)	-0.05	2.55	0.64	0.3
124.		Gumti-DW		1.49	2.06	1.15
125.		Guru Sar-Pz	0.25	5.7	0.38	0.62
126.		Harraipur-Pz	-0.19	1.01	0.78	0.16
127.		Jajjal	0.1	0.21	0.05	0.2
128.		Jassi Bhagwali	0.29	0.7	-0.24	0.1
129.		Jassi Paowali-Pz	-0.16	0.44	0.56	0.23
130.		Jhanduke	0.03	3.6	3.03	
131.		Jhanduke-Pz	-1.07	3.5	2.25	0.79
132.		Kahan Singh Wala-DW	-0.16	1.5	1.42	0.91
133.		Kalla Bandar	0.6	0.7	0.37	
134.		Kalyan Sukha-Pz	-0.75	2.85	2.4	1.67
135.		Koir Singh Wala-Pz		2.65	3.25	1.84
136.		Kot Bhaktu-Pz	-0.12	0.3	0.3	-0.02
137.		Kot Fatta	-0.17	1.9	1.85	1.41
138.		Kot Guru	-0.17	0.27	0.42	-0.38
139.		Kot Shamir	-0.89	6.61	-0.29	-1.38
140.		Kothaguru-Pz	-0.48	1.26	1.33	0.86
141.		Lahri	0.03			
142.		Lalliana-Pz	-0.1	0.65	0.53	0.68
143.		Lehra Dhulkot-Pz	-0.73	2.83	3.73	2.45
144.		Lehra Khanna-Dw	-0.65	1.4	2.4	2
145.		Maihma Bhagwan-PZ				-0.41
146.		Maisar Khana	-0.24	1.29	0.51	
147.		Maisar Khana-Pz	-0.28	-0.31	-0.44	-0.56
148.		Maluka-Pz		2.56	2.3	1.84
149.		Mandi Kalan-Pz	-0.35	4.9	5.27	4.12
150.		Mehraj-Pz	0.14	2.61	2.55	1.98
151.		Mehta-Pz	-0.18	-0.44	-0.46	-0.54
152.		Multania-Pz	-0.11	0.29	0.19	-0.38
153.		Nahinwala	-0.2	0.68	1.21	1.06
154.		Nathana-Pz	-0.47	4.95	2.35	1.21
155.		Nathena-Pz	-0.14	0.21	-0.11	-0.42
156.		Phul	-0.19	1.5	2.1	2.08
157.		Phulla1	1.11	2.81	2.64	2.14
158.		Puhla-Pz	0.3	1.25	1.6	0.63
159.		Raike Kalan	0.33	2	0.68	0.4

160.		Rajgarh Kubey-Pz	-0.12	-1.65	-1.65	-1.6
161.		Rampura	-1.55	0.31	0.71	0.97
162.		Rayya-Pz	-0.41	3.65	2.55	2.05
163.		Salabatpur-Pz		3.25	2.8	2.25
164.		Sangat -Pz	0.82	0.9	0.69	0.63
165.		Seema-DW	-0.02	2.3	1.25	0.58
166.		Sooch-Pz	-0.49	2.85	2.3	2
167.		Teona-Pz				
168.		Tungwali-Pz	-0.16	2.15	1.23	0.85
169.	FARIDKOT	Bead Sikhanwala- Pz		2	-0.24	-0.23
170.		Behabal Kalan-Pz	0.3	1.9	1.3	0.4
171.		Burj Jawahar Singh-Pz	0.4	2.1	2	0.8
172.		Chahd Baja	0.52	2.49	1.45	0.62
173.		Chak Kalan-Pz	0.1	-1	-0.6	-0.2
174.		Devrana-Pz	0.15	-0.85	-0.15	0.2
175.		Dhaipai-Pz	0.2	-0.25	-0.45	0.05
176.		Dhilwan Kalan	-0.05	1.45	2.25	0.25
177.		Dhudi-Pz	0.4	1.9	0.4	0.45
178.		Dipsinghwala	-0.67	-0.2	-0.8	-0.35
179.		Faridkot-Pz		0.03	-0.6	-0.4
180.		Fatehgarh-Pz	0.6	1.75	1.55	0.7
181.		Ghuiana-Pz	-0.1	1.05	-0.35	-0.4
182.		Karirwali	-0.14	1.41	0.78	2.34
183.		Koharwala- DW	0.2	-0.3		0.3
184.		Kot Kapura	-1.98	-1.48	-2.13	-2.77
185.		Matta	-1.33	0.45	-0.58	-1.47
186.		Mehmuana	-0.45	0.5	-0.34	-0.26
187.		Pahluwala-Pz	-0.95	0.5	-0.3	-0.6
188.		Ratti Rori-Pz	-0.15	-0.3	-0.73	-0.45
189.		Rorian Kapura-Pz	0.2	-0.2	-0.7	0.1
190.		Sandhwan-Pz	-0.8	1	-0.05	-0.6
191.		Sher Singh Wala- Pz		1.75	1.28	1.18
192.	FATEH GARH	Amloh1	0.2			
193.		Badalialasingh	1.14		3.62	3.53
194.		Bagga Kalan	0.35	1.35	1.7	2
195.		Balpur				
196.		Bassi Pathana	-1.41	3.6	3.96	-1.42
197.		Bhagrana	-0.43	0.69	0.02	0.15
198.		Bhateri1	0.7	2.29	2.3	1.7
199.		Burj	0.25	1.45	1.75	1.5
200.		Chandiala-Pz				

201.		Chunni Kalan	-0.03	0.53	1.33	1.48
202.		Fatehgarh Sahib		0	0.35	0
203.		Fatehgarh Sahib-Pz	-1.45	1.28	1.45	0.82
204.		Jai Singh Wala		1.7	2.9	3
205.		Jhambela		1.45	2.05	1.7
206.		Khara			2.3	1.9
207.		Lohar Majra		1.35	2	1.8
208.		Nalini-Pz		2.45	1.45	1.32
209.		Nandpur Kalaur-Pz				
210.		Pawala	0.6	1.51	2.12	1.95
211.		Sado Majra		1.25	1.55	1.55
212.		Shahpur		1.3	1.45	1.35
213.		Tahalpur		1.2	2.7	2.85
214.		Talwara		1.4	1.6	1.2
215.	FIROZPUR	Abohar	0.19	-0.45	-0.1	-0.15
216.		Alamgarh	-0.06	0.55	-0.17	-0.06
217.		Asifwala-Pz	-0.11	0.24	0.22	0.01
218.		Baman Wali-Pz		0.33	0.35	-0.4
219.		Bannawala	-0.26	-1.5	-0.23	-0.34
220.		Bara Mansur Wala-Pz		1.2	1.6	1.8
221.		Bazirdpura	-0.2		-0.24	-0.35
222.		Chak Kandhe Shah-Pz		2.25	2	0
223.		Chak Pune Wala-Pz		0.28	0.53	-0.55
224.		Chamb-Pz		1.45	1.95	0.7
225.		Danewal Satkosi	1.16	0.38	1.17	1.09
226.		Danger Khera-Pz		0.73	0.7	0.61
227.		Dipulana-Pz		0.2	-1.14	
228.		Dulchi Ke-Pz	-0.22	0.68	0.08	-0.22
229.		Fattu Wala-Pz		0.83	2.83	0.98
230.		Fazilka-Pz	0.25	0.49	0.42	0.34
231.		Ghananga Kalan-Pz		0.32	-0.4	0.01
232.		Giddran Wali-Pz			0.12	0.03
233.		Godiwala-Pz	-0.01	0.73	0.73	0.6
234.		Gogiani-Pz		1.62	1.73	-0.05
235.		Guru Harsahai-Pz	-0.56	0.7		
236.		Hamed Saidoke-Pz		0.77	1.42	-0.43
237.		Himmatpura-Pz	0.16	0.7	0.65	0.45
238.		Jaimal Singhwala Pz	0.05	1.48	0.3	0.18
239.		Jaimal wala-Pz		1.08	0.4	-0.2
240.		Jand Wala Johian-Pz		0	-1.3	-0.65
241.		Jandwala M Sagla-Pz		0.24	-1.09	-1.13

242.		Jandwala Watan-Pz	-0.33	0.07	-1.28	-0.33
243.		Jang-Pz		0.8	0.5	0.2
244.		Jhottian Wali-Pz	-0.11	0.29		
245.		Jodhe Wala Bhaini-Pz		0.45	1.77	-0.15
246.		Kahan Singh Wala-Pz	-0.7	0	-0.63	0.45
247.		Kaler Khera-Pz		0.51	0.45	0.35
248.		Kandh Wala-Pz	0.14	-0.26	-0.28	-0.36
249.		Kathgarh-Pz		1.4	0	-0.7
250.		Khan Wala-Pz	-0.14	0.17	0.1	0
251.		Khere Ki Uttar-Pz	0.41	1.59	1.59	0.09
252.		Khuiansarwar- Pz	-0.33	-0.25	-0.4	-0.44
253.		Kundal1	-0.45	0.45	-0.49	-0.33
254.		Ladhuwala	-0.37	-1.43	-0.79	-0.38
255.		Lauhke Kalan- Pz		4.09	2.45	1
256.		Lohere Khurd-Pz		1.25	1.64	0.65
257.		Machi Bugra/ Gujran-Pz	-0.2		2.25	0.65
258.		Mallanwala Khas-Pz		1	1.05	0.2
259.		Malluwala-Pz		2.4	2.4	1.35
260.		Malsian-Pz		2.18	0.54	0.3
261.		Malukpur-Pz	-0.01	0.37	0.39	0.21
262.		Mana Singh Wala-Pz	-0.44	0.7	-0.75	-0.1
263.		Markhiwa Bhamni-Pz	-0.07	0.09	0.08	-0.04
264.		Mohkam Khan Wala-Pz	0.43	2.81	1.5	0.85
265.		Mohre Wala-Pz		2.67	0.58	0.23
266.		Motiwala 07pz	-0.31			
267.		Mudki-Pz	-0.2	0.45	0.56	-0.05
268.		Mullian Wali-Pz	-0.09	0.15	0.13	0
269.		Muradwala Dal-Pz	-0.12	0.65	0.68	0.52
270.		Nihalkhera	-0.2	1.17	-0.19	-0.1
271.		Nure-Ki-Uttar 07pz	0.25	1.67	0.31	-0.12
272.		Pancha Wali-Pz	-0.15	0.18	0.28	0.24
273.		Pattiwalla-Pz		0.06	-0.01	-0.08
274.		Piyarana	-0.72	0.53	-0.04	0.12
275.		Rala Hazi- Pz		0.9	-0.45	-0.2
276.		Ramsara-Pz	0.16	0.61	0.49	0.38
277.		Roran Wala-pz		0.4	0.48	0.53
278.		Rukne Wala-Pz	-0.65	1.4	0.93	1.05
279.		Sadhusha Wala-Pz	-0.6	1.5	0.3	-0.02
280.		Sham Singhwala-Pz	-0.4	0.1	-0.64	-0.73
281.		Shatriwala-Pz		0.27	0.2	0.1
282.		Sherewala-Pz	0.12	0.59	0.64	0.54

283.		Singhpura-Pz	0.06	0.24	0.25	0.15
284.		Sitoganno	0.26	0.01	-0.43	-0.39
285.		Sohangarh Ratte	-1.61	0.11	-0.27	-0.05
286.		Swah Wala- Pz		0.95	-0.4	-0.48
287.		Talwandi Jalle Khan-pz		1.25	1.72	0.85
288.		Tibbi Kalan-Pz		1.22	0.72	0.12
289.		Tibbi Taiwan Laluwalla-Pz		0.55	0.2	0.55
290.		Wage Wala-Pz	0.55	1.29	1.3	0.8
291.	GURDASPUR	Aulakhkalan	-0.12		0.79	0.51
292.		Bamyal	-0.36	-0.22	-0.32	-0.27
293.		Bhagowal	-0.52	0.12	-2.96	-0.4
294.		Bham	-0.3	1.13	-0.87	-0.97
295.		Bhoa	-0.44	-1.02	-0.25	-0.22
296.		Bilasbal-Pz		0.6	0.3	-0.2
297.		Chahal Kalan-Pz		0.6	0.5	0.2
298.		Chahgill-Pz		0.6	0.6	0.2
299.		Chone-Pz		0.45	0.55	0.25
300.		Dakoha-Pz	-0.12	1.71	0.45	0.35
301.		Dera Baba Nanak	0.18	0.6	-0.43	-1.01
302.		Dhar Khurd		0.5	0.6	0.2
303.		Dhianpur	-0.14		-1.11	-0.04
304.		Dinanagar	-0.48	-0.5	-1.29	-0.27
305.		Dostpur-Pz		1.1	1	0.6
306.		Gajikort-Pz		0.55	0.6	0.4
307.		Galri	-0.81	-0.41	0.75	0.14
308.		Ghania Ki bangar- Pz	-0.06	1.31	-0.16	-0.09
309.		Gharotakalan	0.33		-0.79	-0.41
310.		Ghoh DW	-2.34	-0.85	-1.02	
311.		Ghumani Khurd-Pz		0.55	0.4	0.1
312.		Gurdaspur-Pz		0.6	0.6	0.2
313.		Harchowal-Pz		0.5	0.5	0.2
314.		Hargobindpur	-0.3	-3.4	-0.2	-0.21
315.		Hassanpur Kalan-Pz			0.6	0.4
316.		Jandwala		7.4	7	6.5
317.		Jhakolahri	-0.25	-0.68	-0.51	-0.54
318.		Jhandalbana-Pz		0.9	0.9	0.5
319.		Kala Afgana-Pz		0.85	0.9	0.5
320.		Kalanaur-DW	0.52	0.56	0.67	0.71
321.		Kalanaur-Pz	-0.02	2.46	0.31	0.53
322.		Kalerkalan-Pz		0.8	0.7	0.5
323.		Kaure-Pz		0.7	0.8	0.4

324.		Khanikhui	-0.54	-0.62		-0.34
325.		Khanmalik-Pz		0.45	1.1	0.7
326.		Khatgarh-Pz		0.55	0.8	0.4
327.		Lakankala-Pz		1.3	1.4	1.1
328.		Langurwal-Pz		0.65	0.7	0.5
329.		Madipur Fatehgarhchuria	1.04	2.88	1.19	1.11
330.		Malikpur-Pz		0.6	0.7	0.3
331.		Mallewal-Pz		0.5	0.5	0.2
332.		Maman-Pz		0.55	0.65	0.35
333.		Masana-Pz		0.6	0.5	0.15
334.		Massit-Pz		0.6	0.3	0.1
335.		Mirthal-DW		0.5		0.7
336.		Mirza Jaan-Pz		0.5	0.6	0.3
337.		Mullowali 1(vs)	0.17	0.83	-0.28	-0.2
338.		Mullowali 2(m)	-0.07	1.15		0.23
339.		Muthi		0.6	0.9	0.7
340.		Nangal-Pz		1.2	1.2	0.9
341.		Narot Jaimalsingh-Pz		-0.9	-0.4	-0.5
342.		Nawan Pind	-0.09	-2.7	-0.03	0.25
343.		Nishayara	-0.07	1.35	-0.21	-0.06
344.		Pandoritalab	-0.19	-1.88	0	-0.01
345.		Paniar				0.3
346.		Parcha-Pz		0.6	0.65	0.35
347.		Parmota-DW				
348.		Pathankot1	0.19	-0.52	-1.31	-1.07
349.		Patti Atwal-Pz				
350.		Phulpiara		0.5	0.8	0.5
351.		Saidowal Kalan-DW				
352.		Saleh Chak-S	-0.1	1.04		0.37
353.		Salehchak(vs)	-0.22	0.39		0.22
354.		Sarna1	-0.61	-4.6	-1.66	
355.		Sathial-Pz	-1.67	-0.51		-1.42
356.		Shahpur Jattan-Pz		0.45	0.5	0.3
357.		Shahpur-Pz		0.6	0.55	0.25
358.		Shezada Kalan-Pz		1.15	1.15	0.75
359.		Shikar-Pz		0.5	0.7	0.5
360.		Sohal				0.2
361.		Tikriwala-Pz		0.75	0.5	0.1
362.	HOSHIARPUR	Adowal Garhi-Pz	-0.54	1.05	2.02	0.72
363.		Argowal-Pz				
364.		Badla-Pz		1.95	2.6	2.15

365.		Baichan-Pz		2.3	2.7	2.5
366.		Bajwara-Pz		1.55	2.1	3.7
367.		Bhalowal Gujjran-Pz				
368.		Bhamnaur	-1.61		0.15	1.36
369.		Budhi Pind-Pz		1.65	2.1	1.9
370.		Chohal	0.08	-0.14	-0.09	-2.25
371.		Dasuya2 (s)	0.59			0.58
372.		Dharampur1				1.7
373.		Durimiwal	-0.42	0.94	0.16	0.33
374.		Fattowal-Pz		1.45	2.65	2.4
375.		Garh Di Wala-Pz	-2.8	2.34	-0.39	-1.52
376.		Garhshankar (s)	-3.39		1.49	0.77
377.		Grahaya-Pz		2.15	2.7	2.4
378.		Hazipur	-0.36	-0.06	-0.36	-0.06
379.		Jalalpur-Pz		1.85	2.1	1.85
380.		Jattpur-Pz		1.6	2	1.6
381.		Khera-Pz		2.25	2.4	2.2
382.		Mahil Baltohian-Pz		1.65	2.05	1.8
383.		Mahilpur-Pz	-0.72	0.34	0.56	0.51
384.		Mianipur-Pz		1.2	1.4	1.15
385.		Mukerian Dw	-1.11			0.05
386.		Nangal Bihala- DW	-0.68	2.89	1.11	0.56
387.		Nangal Thathal-Pz		2.05	2.5	2.3
388.		Pandori Mehal-Pz		2.25	2.5	2.3
389.		Parshote-Pz		1.9	2.25	2.05
390.		Phuglana- Pz	-3.41	2.64	0.4	-1.99
391.		Rampur Colony (HSP) pz-medium	2.51		-0.43	-1.7
392.		Sham Chaurasi		0.38	0.31	0.31
393.		Simbli- OW	-1.19	5.31	1.92	-0.1
394.		Simbli-Pz	-0.09	3.2	2.54	-0.25
395.		Talwara1	-0.76	-2.27	-0.14	0.24
396.		Thakarwala	-0.3	0.24	0.59	-0.24
397.	JALANDHAR	Adampur 3(s)	-1.35	0.82	-0.65	-2.27
398.		Adarman-Pz		1.4	1.5	1.1
399.		Akalpur-Pz		1.5	-0.2	-0.6
400.		Allawalpur		1.82	0.67	2.56
401.		Bilga-Pz		2.4	2	1.3
402.		Billi Chahrami-Pz		2.35	1.75	0.1
403.		Chania-Pz		3.3	0.2	0
404.		Dhanda-Pz		0.7	0.9	0.6
405.		Dhirowal-Pz		1.3	1.1	0.6

406.		Fateh Jalal-Pz		3.2	0.1	-0.55
407.		Gehlan-pz		1.35	1.35	0.85
408.		Gillian-Pz		2.6	2.5	2.2
409.		Hardo Pharwal-Pz		2.4	0.7	0.2
410.		Hardo Sheikh-Pz		2.3	1.1	0.6
411.		Jalandhar 3(vs)	-0.5		1.87	
412.		Jandiala-Pz	0.4	1.9	1.78	1.18
413.		Jandu Singha-Pz		3.4	3.3	3
414.		Janian-Pz		1.9	2.1	1.65
415.		Kakar Kalan-Pz			0.8	0.2
416.		Kala-Pz		1.4	1	0.8
417.		Kalyanpur-Pz		0.65	0.35	0.4
418.		Kang Sahib Rai-Pz		2	1.7	1.5
419.		Kartarpur 2(s)	-2.61	-0.52	-1.99	-1.74
420.		Kharal Kalan Pz-S	-1.33	2.53	0.84	0.19
421.		Kot Wadal Khan-Pz		1.7	0.9	0.7
422.		Kurla-Pz		1.9	1.1	0.4
423.		Lallian kalan Pz-S	0.41	2.39	2.4	1.33
424.		Mahmuwal-Pz		1.5	1.4	1.2
425.		Mehsampur-Pz		1.5	0.9	0.65
426.		Nakodar 2(m)	1.47	2.88	2.38	2.07
427.		Nakodar 3(s)	1.24	3.28	2.87	-0.22
428.		Nangal Shaman		2	0.9	0.7
429.		Nasirpur-Pz		1.5	1	0.8
430.		Nussi-Pz		3.1	0.9	-0.6
431.		Pathial-Pz		1.9	2.1	1.5
432.		Pharwala-Pz		1.6	0.7	0.1
433.		Phillaur 2(s)	-0.1	0.21	0.06	-0.06
434.		Rurka Kalan- Pz		3.6	2.2	2
435.		Samarahi-Pz		2	1.3	0.9
436.		Sarih Pz-S	-0.19	1.21		
437.		Shahkot(s)	0.85		2.21	
438.		Skarar Pur-Pz		2.9	-0.1	-0.9
439.		Sultanpur-Pz		-2.4	-3.1	-3.7
440.		Talwandi Bhutial-Pz		2.7	2.3	1.9
441.		Talwan-Pz		1.1	0.3	0.1
442.		Thanda-Pz		5.5	4.4	4.25
443.	KAPURTHALA	Amanipur-Pz		4.6	1.1	0.8
444.		Balera-Pz		5.7	3.3	2.25
445.		Bauril Harnampur-Pz		2.92	1.3	0.75
446.		Begowal-Pz		1.78	-0.02	-0.34

447.		Bhanoki-Pz		3.75	1.8	1.2
448.		Bhatnura Khurd- S	0.14	4.29	0.86	-2.71
449.		Bhawanipur-Pz		3.4	1	-0.5
450.		Bholath M	0.04	2	0.63	0.27
451.		Bholath S	0.09	1.47	0.78	0.19
452.		Chakoke-Pz		1.9	0.25	-0.25
453.		Dadwindi-Pz				
454.		Dalla	-0.6		1.87	0.5
455.		Hamira-Pz		0.58	-0.09	-0.3
456.		Hazipur-Pz		3.5	0.3	0
457.		Kapurthala2 (s)	-1.35	2.06	0.29	0.68
458.		Karnail Ganju-Pz		1.35	0.7	0
459.		Kishanpur		8.4	3.8	1.6
460.		Maheru-Pz		5.1	3.55	3.7
461.		Miani Bola-Pz		1.18	0.2	-0.1
462.		Mithra-Pz		3.3	1	0.3
463.		Nadala		0.58	-0.12	-0.27
464.		Nathu Chahal-Pz		6.99	3.49	1.69
465.		Nurpur Janoa-Pz		1.04	0.4	0
466.		Paazian-Pz		6.4	1.35	-0.15
467.		Phagwara2 (s)	1.14	4.28	2.87	1.34
468.		Phulewal-Pz		1.8	0.2	0
469.		Rawalpindi-Pz		9.6	4	1.5
470.		Saiflabad-Pz		1.5	0.7	0.45
471.		Sangatpur-Pz		8.8	3.5	0.8
472.		Shalapur Dona-Pz		6.2	2.1	1.3
473.		Sheikh Manga-Pz		2.57	1	1
474.		Sultanpur2 (s)	0.48	3.6	1.7	1.17
475.		Talwandi Chaudary -Pz	-0.63	2.69	0.69	0.46
476.		Thikriwali-Pz		0.75	0.35	-0.23
477.	LUDHIANA	Alamgir-Pz		1.14	0.94	0.56
478.		Aliwal-Pz		2.59	1.63	1.58
479.		Begowal	0.1	0.85	0.47	0.37
480.		Bhagwanpur-Pz		0.37	1.12	0.92
481.		Bharthala Randhawa-Pz		3.47	2.27	1.82
482.		Bhikhi Khatron-Pz		0.62	1.19	1.19
483.		Bilaspur-Pz		1.4	0.82	0.95
484.		Chaminala-Pz		2.15	1.05	0.35
485.		Chankian Khurd-Pz		2.24	0.52	0.7
486.		Chaunta-Pz		0.42	1.72	1.69
487.		Chhapar-Pz		2.35	1.97	1.42

488.		Dinnamder-Pz		3.03	2.28	1.98
489.		Dodpur-Pz		0.5	1.53	1.42
490.		Doraha-Pz	-0.58	-0.71	-0.79	-1.1
491.		Galibkalan-Pz		5.48	4.18	2.93
492.		Gohaur-Pz		2.74	0.64	0.34
493.		Gopalpur 2(s)	0.03		2.29	1.77
494.		Hambowal-Pz		0.44	1.22	1.22
495.		Harnampur		3.6	2.25	0.7
496.		Hedon-Pz		0.39	1.31	1.4
497.		Ikloha-Pz	-0.47	1.05	0.81	0.69
498.		Kadon-Pz		8.68		
499.		Kalsian		2.2		
500.		Katanikalan-Pz		0.25	2.7	2.1
501.		Khandur		1.75	-0.35	-0.2
502.		Kishangarh-Pz		3	1.4	0.85
503.		Kishanpur-Pz		3.1	1.9	1.3
504.		Lalan1	-0.3	0.76	3.42	2.05
505.		Lelon-Pz		0.24	1.1	1.2
506.		Lil- II Pz	-0.66		0.64	0.44
507.		Lil-Pz III	-0.56		0.14	0.26
508.		Lodhiwal-Pz		1.9	0.12	0.14
509.		Lohara-Pz		2.3	0.5	0.44
510.		Maksudra-Pz	0.01	1.18	1.4	1.3
511.		Manak Majra-Pz		2.85	0.73	0.49
512.		Mangat-Pz		0.54	2.4	1.7
513.		Manoke-Pz		2.17	1.59	1.7
514.		Mehma Singh Wala-Pz			2.85	2.1
515.		Mehma-Pz		2.39		
516.		Mushkabad	-0.64		1.69	
517.		Nurpur-Pz		2.42	0	-0.23
518.		P.A.U.Ludhiana 2(s)	-0.76	0.96	2.07	1.87
519.		Pabbian-Pz		2.24	1.04	0.29
520.		Pandori-Pz		3.79	0.3	-0.45
521.		Payal-Pz		1.95	1.54	0.99
522.		Punjeta	-0.26	0.12	1.1	0.75
523.		Ragba-Pz		2.58	-0.28	0.32
524.		Raikot-Pz		5	1.85	1.2
525.		Rajona Khurd		3.02	2.9	1.25
526.		Rashiana-Pz		2.9	2.7	1.85
527.		Rashin		2.45	2.4	1.8
528.		Rattewal-Pz		3.1	2.47	1.77

529.		Roomi-Pz		6.33	2.29	1.76
530.		Sajaywal-Pz		6.7	3.98	1.63
531.		Samrala 2(s)	2.05		3.55	0.85
532.		Sanewal-Pz		1.34	0.26	-0.37
533.		Sangatpura-Pz		1.03	1.09	0.94
534.		Sherian	0.16	0.62	2.11	2.21
535.		Sherpur-Pz		0.35		0.43
536.		Sidhwan Bet-Pz	-1.88	-0.28	0.9	0.6
537.		Talwandi Kalan-Pz		2.72	-0.75	-0.65
538.		Udonwal-Pz		0.32	1.72	1.12
539.		Upplan		0.3	1	0.77
540.		Utlan	0.27	1.27	1.36	1.18
541.	MANSA	Adamke-Pz		0.68	0.51	-0.08
542.		Bhikhi 2 (s)	-0.51			
543.		Budhlada	-0.47	0.45	-4.18	
544.		Budhlada-Pz				
545.		Burj Bhalaike	-0.37	0.05	-1.75	-0.04
546.		Burj Rathi-Pz				
547.		Fattamaluka	-0.23	0.84	0.64	0.61
548.		Gehlan-Pz		1.29	1.12	0.62
549.		Jatana Kalan-Pz		0.54	0.61	0.34
550.		Kot Dhamru	-0.04	0.63	0.08	-0.03
551.		Kotra	-0.62	-2.23		
552.		Raipur-Pz	-1.6	1.16	0.75	
553.		Ralla	-1.29			0.66
554.	MOGA	Baje Ke-Pz	-5.12	-0.51	-2.28	-4.04
555.		Baraghar-Pz		2.3	2.4	1.3
556.		Budh Singh Wala-Pz	0.35	2.36	2	1.26
557.		Chogawan-Pz	0.83	3.09		1.99
558.		Dagru- Pz	1.07	2.67	2.62	1.89
559.		Damru Khurd	1.2	3.53	3.16	2.63
560.		Darapur			3.95	
561.		Darapur 07pz	-1.02	0.65	2.4	3.58
562.		Daulatpur Niwan-Pz		1.85	1.9	0.7
563.		Ghoha Khurd-Pz		1.7		0.8
564.		Himatpura-Pz		2.05	2.1	0.6
565.		Indergarh-Pz				
566.		Jhandewala-Pz		2.5	2.25	1
567.		Khokri Kalan-Pz		2.3	3	1.7
568.		Khosakotta-Pz		1		
569.		Mangewala-Pz		2.4	2.6	1.25

570.		Nihalsinghwala-Pz	-0.09	2.44	2.61	1.92
571.		Raonke Kalan-Pz		5.5	5.7	4.4
572.		Samalsar-Pz		1.4		
573.		Thathe Bhai-Pz				-0.9
574.	MUKTSAR	Abulkharana				
575.		Abulkharana-Pz		0.12	0.19	0.02
576.		Alam Wala		0.97	-0.1	-0.43
577.		Assa Butter-Pz		0.45	0.48	0.3
578.		Balocha Khera(rasoolpur)	-0.53	1.37	0.24	-1.18
579.		Bariwala-Pz		-0.4	-0.6	-0.45
580.		Bhaliana	-0.01	1.07	0.89	0.67
581.		Bhamma(bam)				
582.		Bhiti Wala-Pz		0.32	0.29	0.16
583.		Chaktam Kot-Pz		0.7	-0.28	-0.4
584.		Chotian-Pz		0.04	0.03	-0.17
585.		Dhalkot-Pz		0.26	0.2	-0.01
586.		Doda	-2.31	-1.3	0.06	
587.		Doda-Pz		0.23	-0.35	0.28
588.		Gaga-Pz		0.24	0.28	0.15
589.		Husnar-Pz		0.12	0.04	-0.09
590.		Jhurar-Pz		0.73	0.4	0.1
591.		Kabar Wala	-0.2	1.02		1.07
592.		Kattianwali-Pz		0.45	-0.75	-0.43
593.		Khirkian Wala-Pz		0.18	0.32	0.17
594.		Khunde Halal-Pz	-0.45	1.13	-0.32	
595.		Killian Wali-Pz		0.06	0.13	0.03
596.		Kollian Wali-pz		0.1	-0.25	-0.12
597.		Kot Bhai- DW		0.1	0.12	0.02
598.		Kuttianwali	-0.4	-0.35	-0.27	
599.		Labanianwali	-0.29	0.96	-0.07	-0.31
600.		Lambi	-1.48	0.63	0.04	1.4
601.		Lambi-Pz		1.01	0.77	
602.		Muktsar	0.13	1.35	0.64	0.71
603.		Phulu Khera-Pz		0.08	0.22	0.07
604.		Ratta Khera Chota-Pz		0	-0.73	-0.65
605.		Sheikh-Pz		0.4	0.53	0.38
606.		Sohiwal-Pz		-0.1	-1.25	-0.85
607.	NAWANSHAHR	Alowal-Pz		0.5	0.3	0.2
608.		Baharam-Pz		1.25		0.25
609.		Bahara-Pz		1.1	0.7	0
610.		Bahlora Kallan- Pz	-0.38	-0.22	-0.6	-0.64

611.		Bahua-Pz		1.6	1.3	0.6
612.		Balachore	-1.68	-0.9		-1.07
613.		Hakimpur-Pz		0.4	0.5	
614.		Kariam-Pz		0.6	-0.7	-1.1
615.		Mauhra-Pz	-1.81	-0.13	0.37	-0.47
616.		Rahon	-0.23	-0.44	-0.32	-0.36
617.		Raipur Dhaba-Pz	-0.9	-1.27	-0.62	-1.02
618.	PATIALA	Antala	1.81	-2.45	0.07	-2.1
619.		Ballopur			-0.35	-1
620.		Banur 07pz	0.53	-1.05	-0.04	-0.54
621.		Bhankhar-Pz		1	1	
622.		Bhojo majri 07pz	-0.59	0.28	0.58	0.69
623.		Binzal-Pz		0.45	0.45	0.2
624.		Birkauli	-0.12	3.26	2.48	2.1
625.		Chandiala-Pz		0.65	1.45	1.45
626.		Chhat	-0.03	-1.5		-2.4
627.		Dera Bassi 07pz	-0.79	1.05	0.8	1.84
628.		Devigarh 1Pz	0.42		3	3.11
629.		Devigarh IIPz	0.41		2.75	2.79
630.		Devigarh-III Pz	0.35		2.56	2.38
631.		Dhakdaba 07	-1.54	0.6	1.86	1.98
632.		Haluka	-1.23	-0.84	-0.85	-1.46
633.		Handesaran-s	2.44	1.2	4.89	
634.		Harion Kalan-Pz		-0.7	-0.1	-0.1
635.		Joli	-0.78	-0.5	-0.4	-0.35
636.		Kakrala-Pz		-0.1	-0.5	0.1
637.		Kalyan 07pz	-1.36	1.5	3.02	0.62
638.		Kami Kalan	0.45		0.51	0.23
639.		Kulburcha-Pz		0.2	0.2	0
640.		Kutha Kheri-Pz		0.5	0.2	0.65
641.		Lacharu Kalan	-1.34	0.47	0.78	0.72
642.		Lachkani-Pz	-0.42	1.16	0.77	0.66
643.		Miranpur- Pz	-0.8	2.51	2.6	2.87
644.		Mirpur-Pz	-1.56			
645.		Nanhera-Pz		0.9	0.6	0.2
646.		Nariana	0.22		1.5	
647.		Patran-Pz	0.43	0.34	-0.21	-0.33
648.		Rajpura Pz M		2.35		
649.		Rajpura-PzSt				
650.		Samana-Pz	-1.64		1.31	1.16
651.		Samaspur-Pz		-1.85	0.6	0.4

652.		Sangatpura-Pz	-0.25		2.29	1.61
653.		Singhpura-Pz		0.8	1	0.95
654.		Sirsini	1.2	1.22	0.85	1.17
655.		Thua	-2.31	1.8	2.6	2.22
656.	RUPNAGAR	Ahmedpur	-0.46	2.5	1.2	1.95
657.		Bera Chauta	0.27	0.44	0.76	-0.11
658.		Bhalan	-0.94	-1.45	-0.53	-2.31
659.		Braham Pur	-0.14	-2.21	-0.21	-2.56
660.		Chakdera	-0.41	-0.93	0.14	-0.98
661.		Chanalon	0.09		1.7	
662.		Chatamli- Pz	-0.68	5.59	2.59	5.84
663.		Dhair	-0.4	1.42	-0.05	-0.3
664.		Dheri	-0.74	-0.68		-0.78
665.		Dumewal	-1.66	-1.9	-0.43	-2.25
666.		Gharoon		0.8	-0.2	-0.7
667.		Ghoga	-1.4	-0.45	-0.8	-0.75
668.		Hardinamoh	-1.26	-2.02	-0.96	-1.87
669.		Kakrali	-1.36	-0.15	-0.25	
670.		Kurrha-Pz		0.55	0	-0.3
671.		Landran	-1.34			
672.		Landran-Pz	0.1			
673.		Malkpur-Pz		1	0.6	1.3
674.		Raipur Kalan		1.1		
675.		Ropar			0.4	0.25
676.		Rurki Heeran-Pz	-0.12	1.08	0.58	2.34
677.		Soara	0.14	0.79	1.15	0.59
678.	SANGRUR	Bagarian-Pz	0.73	2.89	1.99	1.9
679.		Bapla-Pz		0.42		
680.		Barnala (s)	-1.36	1.13	1.63	1.51
681.		Bhadaur-Pz	-1.96	2.34	1.92	1.12
682.		Bhojowali-Pz	-1.22	2.59	1.85	0.98
683.		Bugra 1	-0.57	5.37	2.18	
684.		Chural Kalan M	-0.67	0.9	2.09	2.24
685.		Dharamgarh-Pz		0.67		
686.		Gahl 07pz			1.18	1.24
687.		Gehlon-Pz	-0.1	1.2	2.57	
688.		Ghanauri Kalan-Pz	2.15	1.38	1.15	0.55
689.		Haryao-DW			3.05	2.59
690.		Hassanpur-Pz		0.42		
691.		Isra-Pz		0.18	1.07	0.92
692.		Kala Jhar-Pz		0.7	0.62	0.44

693.		Kuler Khurd-Pz		0.36	0.9	0.69
694.		Kurar-Pz		3.3	1.9	2.4
695.		Ladda-Pz	-0.27		3.6	1.5
696.		Lehal Kalan-Pz		0.34	2.15	1.99
697.		Lohgarh-Pz		1.56	1.16	1.02
698.		Longowal-Pz	-0.14	1.39	1.56	0.56
699.		Mahal Kalan-Pz	-0.98		1.39	1.29
700.		Malerkotla-DW	-0.47	0.82	3.07	1.69
701.		Mastuana-Pz		0.36	0.86	
702.		Mehsampur 07pz			1.77	
703.		Mehsampur-Pz	2.62	0.35		1.41
704.		Nangal-Pz		2.2	2.1	0.7
705.		Panjgaraian- Pz		0.36	2.06	2.16
706.		Ramgarh-Pz		0.9	0.8	0
707.		Rampur Channa-Pz		0.52	1.72	1.65
708.		Rurki Kalan-Pz		0.31	1.97	2.72
709.		Sunam-Pz	-0.1	1.48	1.6	1.45
710.		Tappa Mandi-Pz		2.6	2.7	1.6
711.						

Annexure-III

S. NO.	District	GWOW Location	WATER LEVEL FLUCTUATION (m)			
			May 2013-May 2014	Aug. 2013-Aug. 2014	Nov. 2013-Nov. 2014	Jan. 2014-Jan. 2015
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Chandigarh	Burail	1.7	2	0.03	0.32
2.		Csio-Combined	-0.4	-0.57	-3.05	-1.02
3.		Csio-S	0.74	0.45	-0.34	-0.35
4.		Maloya pzm	0.09	-1.11	-1.62	-1.82
5.		New Indust Area	-0.45	1.13	-4.65	0.15
6.		Sec-27, Ar Well	-6.05	-0.35	0.63	-2.13
7.		Sect 10c (D)	2.03	1.15	0.56	1.6
8.		Sect 10c (S)	0.45	2.1	0.66	2.15
9.		Sect 21d (S)	1.96			
10.		Sect 31d (D)	2.25	2.06	0.72	-0.69
11.		Sect 31d (S)	-1.18	4.95	0.03	0.47
12.		Sect 37d (S)	2.05	2.15	-0.33	-1.6
13.		Sect 39d (S)	0.93	0.98	-1	-0.21
14.		Sect 44d (S)	-0.75		-0.6	-0.38
15.		Sector 52- PZ	3.45	-0.21	-0.28	2.65
16.		Sector-46 (Shallow)	-0.22		-0.28	
17.	Amritsar	Aima Khurd-Pz	-0.1	-0.84		
18.		Ajnala	1.16	-0.01	0.58	0.43
19.		Aminshah Khalra	2.46		-0.4	-1.34
20.		Amritsar1	0.77	-0.46	0.68	
21.		Bakipur-Pz				-0.26
22.		Bal Kalan-Pz				-2.00
23.		Bath-Pz				-0.08
24.		Beas07	0.23	-0.01	0.69	-0.38
25.		Bhagala-Pz				-0.90
26.		Bhalaipur-Pz				-0.40
27.		Bhankar Kalan-Pz				-0.02
28.		Bhattaywad-Pz				-0.40
29.		Bhikiwind- Pz	0.37	-1.40	0.01	-0.65
30.		Bhura-Pz				0.05
31.		Bhure-Pz				-0.45
32.		Bhusse-Pz				-0.14
33.		Boparai Khurd-Pz	0.65	-0.55		-0.25
34.		Brahmpur-Pz				-0.10
35.		Burjwal-Pz				-0.31
36.		Chabal 07	0.54	-0.18	-0.15	-0.98
37.		Chak Dogra-Pz				-0.10
38.		Chakkare Khan-Pz				-0.30

39.		Chogwan- Pz	1.47	-1.33	1.56	-0.40
40.		Chola Sahib-Pz	-0.07	-2.70	0.26	-0.16
41.		Choudhary Wala-Pz				0.00
42.		Chuselawad-Pz	-0.38	-1.08		-0.56
43.		Dhariwal-Pz				-0.15
44.		Dholan-Pz				0.19
45.		Dhulika-Pz				0.50
46.		Dohan-Pz				-0.60
47.		Ekalgoda-Pz				-0.30
48.		Gago Mahal- Pz	1.05	0.16	0.74	0.24
49.		Gandi Wind-Pz	1.08	-0.61	0.05	-0.40
50.		Gill Wali-Pz				-1.80
51.		Goindwal 07	0.67	0.19	0.54	-0.03
52.		Gujjaran Wali-Pz				-0.90
53.		Jandiala Guru-Pz	0.69	-0.72	0.33	-0.41
54.		Jandoke-Pz				0.78
55.		Jasrur-Pz				-0.10
56.		Jethuwal-Pz				-0.10
57.		Kalsia Kalan07	0.47	-1.81		
58.		Kandowali-Pz				-0.50
59.		Karyal-Pz				-1.00
60.		Khadur Sahib-Pz	0.26	-0.74	0.1	-0.48
61.		Khalra-Pz				-1.00
62.		Khilchian-Pz	0.2	-0.90		-1.10
63.		Kotbudda-Pz				0.00
64.		Kotli Sur Singh-Pz	-0.65	-1.25		-0.61
65.		Mahendipur-Pz				-0.22
66.		Mahima-Pz				0.20
67.		Majitha- Pz	-1.1	-2.40		
68.		Makhan Windi-Pz				-1.30
69.		Marhona-Pz				-0.14
70.		Mari Kamboke-Pz				0.19
71.		Mehleykey-Pz				4.70
72.		Mehta-Pz				-0.25
73.		Miran Chak-Pz				-1.80
74.		Mohawa	1.37	-1.25	0.63	-0.29
75.		Nangal Sahaul-Pz				1.00
76.		Nawan Tanal- Pz	1.29	-0.73	0.32	-0.34
77.		Pakharpura-Pz				-0.40
78.		Pindan-Pz				-1.06
79.		Rajoke-Pz				0.06
80.		Rampura-Pz	1.72	0.72		-1.80

81.		Ratoke-Pz	1.64	-4.88	-0.35	-0.59
82.		Rupowal Brahmana-Pz	-0.45	-1.45		-0.65
83.		Sabran-Pz				0.10
84.		Sahab Pura- Pz	-1.26	-1.61	1.49	-1.28
85.		Sathiala-Pz				-0.60
86.		Shabura-Pz				2.70
87.		Sham Nagar-Pz				0.30
88.		Sheron-Pz				0.18
89.		Talwandi Dogra-Pz	-2.5	-4.00		-1.90
90.		Tarsika-Pz				-3.00
91.		Thatha- Pz	-0.65	-1.15		-0.52
92.		Ugar Aulakh-Pz				-6.20
93.		Vadala Kalan-Pz				-0.60
94.	Bathinda	Ablu	3.76	0.19	1.38	-0.40
95.		Badiala-Pz	-0.19	-3.54	-2.28	-1.39
96.		Bagher Mohabat Singh-Pz				-0.07
97.		Bahman Kaur Singh-Pz				-0.11
98.		Balianwali-Pz				-3.87
99.		Balluana1	0.02	-0.62	-0.65	-1.00
100.		Balluana-Pz				-1.02
101.		Banbhiha-Pz				0.02
102.		Bhagibandar	0.43	-0.23	-2.35	-0.04
103.		Bugran-Pz				-2.44
104.		Burj Gill-Pz				-1.46
105.		Burj-Pz				0.16
106.		Deratapp	-0.44	-0.90	-0.19	0.25
107.		Dhapali1	0.23	-1.19	-0.30	-2.41
108.		Dhapali-Pz	-0.78	-3.49	-1.89	-0.80
109.		Dialpur Mirza	-1.51	-3.81	-1.58	-1.40
110.		Dialpura Bhlaike	-0.16	-2.59	-1.98	-1.39
111.		Dulle Wala-Pz				-1.96
112.		Ganga-Pz	-0.1	-1.70	-4.17	
113.		Ghudda			2.00	
114.		Gill Patti-Dw	0.01	-0.46		-0.39
115.		Gulabgarh 2 (S)	0.42	-2.13	0.11	-0.35
116.		Guru Sar-Pz	1.44	-4.26	0.1	-0.37
117.		Harraipur-Pz				-0.35
118.		Jajjal	0.66	0.45	0.25	-0.10
119.		Jassi Bhagwali	2.95	2.25	0.69	0.19
120.		Jassi Paowali-Pz				-0.39
121.		Jhanduke	-0.07	-3.67		

122.		Jhanduke-Pz				-1.86
123.		Kahan Singh Wala-Dw	0.1	-1.40		-1.07
124.		Kalla Bandar	0.55	-0.15	3.08	
125.		Kalyan Sukha-Pz				-2.42
126.		Kot Bhaktu-Pz				-0.10
127.		Kot Fatta				-1.58
128.		Kot Guru				0.21
129.		Kot Shamir	-0.72	-7.33	-0.25	0.49
130.		Kothaguru-Pz	-0.89	-2.15	-1.22	-1.34
131.		Lahri	0.76			
132.		Lalliana-Pz				-0.78
133.		Lehra Dhulkot-Pz				-3.18
134.		Lehra Khanna-Dw	-0.5	-1.90		-2.65
135.		Maisar Khana	0.88	-0.41	-0.47	
136.		Maisar Khana-Pz	-0.22	0.09		0.28
137.		Mandi Kalan-Pz				-4.47
138.		Mehraj-Pz				-1.84
139.		Mehta-Pz				0.36
140.		Multania-Pz				0.27
141.		Nahinwala	1.35	0.67	-1.66	-1.26
142.		Nathana-Pz				-1.68
143.		Nathena-Pz				0.28
144.		Phul	-1.37	-2.87	-1.00	-2.27
145.		Phulla1	0.76	-2.05	-1.03	-1.03
146.		Puhla-Pz	1.1	-0.15		-0.33
147.		Raike Kalan	0.88	-1.12	-0.05	-0.07
148.		Rajgarh Kubey-Pz	-0.32	1.33		1.48
149.		Rampura	-2.99	-3.30	-1.00	-2.52
150.		Rayya-Pz				-2.46
151.		Sangat -Pz	1.38	0.48	0.14	0.19
152.		Seema-DW	0.27	-2.03		-0.60
153.		Sidhana				-3.74
154.		Sooch-Pz				-2.49
155.		Teona-Pz				-0.61
156.		Tungwali-Pz		-0.02		-1.01
157.	Faridkot	Bead Sikhanwala- Pz	0.97	-1.03	-0.14	
158.		Behabal Kalan-Pz				-0.10
159.		Burj Jawahar Singh-Pz	0.35	-1.75		-0.40
160.		Chahd Baja	0.77	-1.72	-0.05	-0.10
161.		Chak Kalan-Pz				0.30
162.		Devrana-Pz	1.87	2.72		-0.05
163.		Dhaipai-Pz	0.11	0.36		0.15

164.		Dhilwan Kalan	0.3	-1.15	-2.10	-0.30
165.		Dhudi-Pz				-0.05
166.		Dipsinghwala	-0.33	-0.13	0.32	-0.32
167.		Fatehgarh-Pz				-0.10
168.		Ghuiana-Pz				0.30
169.		Karirwali	1.97	0.56	-0.87	-2.48
170.		Koharwala- DW				-0.10
171.		Kot Kapura	-2.3	-0.82	0.48	0.79
172.		Matta	-1.52	-1.97	-0.60	0.14
173.		Mehmuana	0.68	0.18	-0.06	-0.19
174.		Pahluwala-Pz				-0.35
175.		Ratti Rori-Pz				0.30
176.		Rorian Kapura-Pz				0.10
177.		Sandhwan-Pz				-0.20
178.		Sher Singh Wala- Pz	2.05	0.30	-0.71	
179.	Fateh Garh	Alipur Sodhian-Pz				
180.		Amloh1	-0.45			
181.		Badalialasingh	1.1		-0.94	-2.39
182.		Bagga Kalan	0.5	-0.85		-1.65
183.		Bassi Pathana	0.08	-3.52	-3.70	0.01
184.		Bhagrana	0.81	0.12	-1.51	-0.58
185.		Bhateri1	0.03	-2.26	-1.03	-1.00
186.		Burj	1.3	-0.15		-1.25
187.		Chunni Kalan				-1.51
188.		Fatehgarh Sahib	-0.1	-0.10		
189.		Fatehgarh Sahib-Pz	-0.12	-1.40	-0.26	-2.27
190.		Jai Singh Wala	0.3	-1.40		
191.		Jhambela	0.45	-1.00		
192.		Khara	0.42			
193.		Lohar Majra	0.07	-1.28		
194.		Pawala	0.92	-0.59	-2.02	-1.35
195.		Sado Majra	-0.55	-1.80		
196.		Shahpur	-1.2	-2.50		
197.		Tahalpur	0.1	-1.10		
198.		Talwara	0.55	-0.85		
199.	Firozpur	Abohar	-0.07	0.38	0.44	0.34
200.		Alamgarh	0.12	-0.43	0.26	0.00
201.		Asifwala-Pz				-0.12
202.		Bannawala	0.56	2.06	0.23	0.08
203.		Bara Mansur Wala-Pz	0.1	-1.10		
204.		Bazirdpura	0.1		0.42	0.15
205.		Chamb-Pz	-0.65	-2.10		

206.		Danewal Satkosi	1.46	1.09	0.19	0.07
207.		Danger Khera-Pz				
208.		Dipulana-Pz	0.73	0.53	0.46	
209.		Dulchi Ke-Pz				0
210.		Godiwala-Pz				-0.61
211.		Gogiani-Pz	-0.2	-1.82		
212.		Himmatpura-Pz				-0.29
213.		Jaimal Singhwala Pz	0.74	-0.74	0.11	-0.13
214.		Jandwala Watan-Pz				0
215.		Kahan Singh Wala-Pz				-1.15
216.		Kaler Khera-Pz				
217.		Kandh Wala-Pz				0.50
218.		Khere Ki Uttar-Pz				-0.14
219.		Khuiansarwar- Pz	0.25	0.50	0.30	0.32
220.		Kundal1	0.08	-0.37	1.26	0.11
221.		Ladhuwala	-0.24	1.19	-0.09	-0.12
222.		Lauhke Kalan- Pz	0.04	-4.05	-1.12	0.01
223.		Lohere Khurd-Pz	0.48	-0.77		
224.		Machi Bugra/ Gujran-Pz				-0.85
225.		Mallanwala Khas-Pz	0.1	-0.90		
226.		Malluwala-Pz	-0.74	-3.14		
227.		Malsian-Pz	-0.03	-2.21	-0.50	
228.		Malukpur-Pz				-0.22
229.		Mana Singh Wala-Pz				-0.34
230.		Markhiwa Bhamni-Pz				-0.03
231.		Mohkam Khan Wala-Pz				-0.42
232.		Mohre Wala-Pz	0.85	-1.82	-0.13	
233.		Motiwala 07pz	0.56			
234.		Mudki-Pz				-0.15
235.		Mullian Wali-Pz				-0.09
236.		Muradwala Dal-Pz				-0.64
237.		Nihalkhera	0.38	-0.79	0.52	-0.10
238.		Nure-Ki-Uttar 07pz	0.71	-0.96	0.23	0.37
239.		Pancha Wali-Pz				-0.39
240.		Pattiwalla-Pz				
241.		Piyarana	0.44	-0.09	-0.44	-0.84
242.		Ramsara-Pz				-0.22
243.		Rukne Wala-Pz				-1.70
244.		Sadhusha Wala-Pz				-0.58
245.		Sham Singhwala-Pz	0.29	0.19	-0.11	0.33
246.		Sherewala-Pz				-0.42

247.		Singhpura-Pz				-0.09
248.		Sitoganno	0.56	0.55	0.78	0.65
249.		Sohangarh Ratte	-0.11	-0.22	-0.68	-1.56
250.		Swah Wala- Pz	0.48	-0.47	0.32	
251.		Talwandi Jalle Khan-Pz	-0.4	-1.65		
252.		Tibbi Taiwan Laluwalla-Pz	0.06	-0.49		
253.		Wage Wala-Pz				-0.25
254.	Gurdaspur	Aulakhkalan	1.46		-0.73	-0.63
255.		Bamyal	0.76	0.98	0.28	-0.09
256.		Bhagowal	0.82	0.70		-0.12
257.		Bham	1.31	0.18	0.55	0.67
258.		Bhoa	0.17	1.19	0.05	-0.22
259.		Bilasbal-Pz	1	0.40		
260.		Chahal Kalan-Pz	1.1	0.50		
261.		Dakoha-Pz	1.22	-0.49	-0.26	-0.47
262.		Dera Baba Nanak	1.64	1.04	0.58	1.19
263.		Dhianpur	-3.9		2.9	-0.10
264.		Dinanagar				-0.21
265.		Gajikort-Pz	-0.8	-1.35		
266.		Galri	0.71	1.12	-0.64	-0.95
267.		Ghania Ki Bangar- Pz	1.01	-0.30	0.07	0.03
268.		Gharotakalan	3.86		1.08	0.74
269.		Ghoh DW	6.38	7.23	-1.27	
270.		Ghumani Khurd-Pz	1	0.45		
271.		Gurdaspur-Pz	2.1	1.50		
272.		Harchowal-Pz	1.45	0.95		
273.		Hargobindpur	0.58	3.98	-0.27	-0.09
274.		Jhakolahri	-0.44	0.24	0.53	0.29
275.		Jhandalbana-Pz	0.3	-0.60		
276.		Kala Afgana-Pz	1.15	0.30		
277.		Kalanaur-DW			0.09	-0.19
278.		Kalanaur-Pz	2.12	-0.34	-0.29	-0.55
279.		Kaure-Pz	0.85	0.15		
280.		Khanikhui	0.01	0.63		-0.20
281.		Khanmalik-Pz	1.8	1.35		
282.		Khatgarh-Pz	0.6	0.05		
283.		Langurwal-Pz	0.6			
284.		Madipur Fatehgarhchuria	1.78	-0.05	-0.11	-0.07
285.		Malikpur-Pz	-0.1	-1.10		
286.		Mallewal-Pz	0.75	-0.70		
287.		Maman-Pz		0.25		

288.		Masana-Pz	0.65	0.05		
289.		Massit-Pz	0.9	0.30		
290.		Mullowali 1(Vs)	1.07	0.24	0.66	0.37
291.		Mullowali 2(M)	1.37	0.22		-0.30
292.		Nangal-Pz	0.8	-0.40		
293.		Nawan Pind	0.46	3.16	-1.40	-0.34
294.		Nishayara	1.85	0.50	0.03	-0.01
295.		Pandoritalab	0.21	2.09	-0.26	-0.18
296.		Parcha-Pz	0.95	0.35		
297.		Pathankot1	0.21	0.73	0.09	1.26
298.		Saleh Chak-S	1.14	0.10		-0.47
299.		Salehchak(Vs)	1.1	0.71		-0.44
300.		Sarna1	-0.29	4.31	0.72	
301.		Sathial-Pz	0.02	0.53		-0.25
302.		Shahpur Jattan-Pz	1.55	1.10		
303.		Shikar-Pz	2	1.50		
304.		Tikriwala-Pz	1.05	0.30		
305.	Hoshiarpur	Adowal Garhi-Pz	-0.35	-1.40	-2.43	-1.26
306.		Bhamnaur	2.43		-2.84	-2.97
307.		Budhi Pind-Pz				2.33
308.		Chohal	0.04	0.18	-0.60	
309.		Dasuya2 (S)	1.3			0.01
310.		Durimiwal	0.39	-0.55	-0.79	-0.75
311.		Garh Di Wala-Pz	-1.07		-1.27	-1.28
312.		Garhshankar (S)	2.32		-4.12	-4.16
313.		Hazipur	1.07	1.13	-0.60	-0.30
314.		Mahilpur-Pz	-0.73	-1.07	-1.17	-1.23
315.		Mukerian Dw	-0.44			-1.16
316.		Nangal Bihala- Dw	1.84	-1.05	-1.92	-1.24
317.		Phuglana- Pz	2.72	0.08	-1.67	-1.42
318.		Rampur Colony (HSP) Pz-Medium	1.48		-0.45	4.21
319.		Sham Chaurasi	0.59	0.21		
320.		Simbli- OW				-1.09
321.		Simbli-Pz	1.28	-1.92	-1.94	0.16
322.		Talwara1	0.32	2.59	-0.45	-1.00
323.		Thakarwala	-0.11	-0.35	-1.23	-0.06
324.	Jalandhar	Adampur 3(S)	0.32	-0.50	-0.33	0.92
325.		Adarman-Pz	1.2	-0.20		
326.		Allawalpur	0.51	-1.31	-1.35	
327.		Billi Chahrami-Pz	3.25	0.90		
328.		Gohiran			-1.44	
329.		Hardo Pharwal-Pz	1.8	-0.60		

330.		Jalandhar 3(Vs)	0.08		-1.44	
331.		Jandiala-Pz	0.38	-1.52	-0.51	-0.78
332.		Kalyanpur-Pz	-0.75	-1.40		
333.		Kartarpur 2(S)	-0.07	0.45	-1.18	-0.87
334.		Kharal Kalan Pz-S	2.41	-0.12	-0.37	-1.52
335.		Lallian Kalan Pz-S	-0.01	-2.40	-1.22	-0.92
336.		Nakodar 2(M)	-0.2	-3.08	-2.81	-0.60
337.		Nakodar 3(S)	0.29	-2.99	-0.59	1.46
338.		Nangal Shaman	2.2	0.20		
339.		Nussi-Pz	3	-0.10		
340.		Phillaur 2(S)	-0.27	-0.48	-0.05	-0.04
341.		Sarih Pz-S	-1.34	-2.55	0.89	
342.		Shahkot(S)	0.49			
343.		Talwandi Bhutial-Pz	2.4	-0.30		
344.		Talwan-Pz	0	-1.10		
345.		Udhopur			-0.03	0.03
346.	Kapurthala	Bhatnura Khurd- S	0.54	-3.75	-0.59	2.85
347.		Bholath M	1.03	-0.97	-0.40	-0.23
348.		Bholath S	0.85	-0.62	-0.41	-0.10
349.		Dalla	0.63		-0.89	-1.10
350.		Kapurthala2 (S)	1.14	-0.92	-1.00	-2.03
351.		Phagwara2 (S)	1.62	-2.66	-1.02	-0.20
352.		Sultanpur2 (S)	1.87	-1.73	-0.97	-0.69
353.		Talwandi Chaudary - Pz	0.56	-2.13	-0.86	-1.09
354.	Ludhiana	Begowal	0.05	-0.80	-1.26	-0.27
355.		Bhahlolpur-DW		-0.08	-0.43	-0.22
356.		Chattar Singh Park-Ldh	-0.41			
357.		Doraha-Pz	-0.21	0.50	0.36	0.52
358.		Gopalpur 2(S)	-0.54		-1.79	-1.74
359.		Habbowal	0.38			
360.		Harnampur	0.32	-3.28		
361.		Ikloha-Pz	-0.4	-1.45	-1.03	-1.16
362.		Kadon-Pz	0.76	-7.92		
363.		Kalsian	-1.85	-4.05		
364.		Khandur	-0.94	-2.69		
365.		Lalan1	0.35	-0.41	-1.27	-1.50
366.		Lil- Ii Pz	-2.54		-0.53	-0.92
367.		Lil-Pz Iii	0.66		-0.42	-0.70
368.		Maksudra-Pz	1.36	0.18	-0.53	-0.48
369.		Mehma-Pz			-0.55	
370.		Mushkabad	0.17			-0.41

371.		P.A.U.Ludhiana 2(S)	-0.36	-1.32	-1.54	-1.05
372.		Punjeta	-0.46	-0.58	0.18	-0.58
373.		Rajona Khurd	-0.18	-3.20		
374.		Rashin	-1.97	-4.42		
375.		Samrala 2(S)	-0.29		-0.28	2.42
376.		Sherian	0.3	-0.32		-0.27
377.		Sidhwan Bet-Pz	3.64	3.92	-0.99	-1.23
378.		Upplan	0.06	-0.24		
379.		Utlan	2.52	1.25		
380.	Mansa	Bhikhi 2 (S)	-0.46			
381.		Budhlada	-0.34	-0.79	4.06	
382.		Budhlada-Pz		-2.45	-0.88	-1.26
383.		Burj Bhalaike	0.93	0.88	1.67	-0.33
384.		Fattamaluka	0.4	-0.44	-0.52	-0.84
385.		Kot Dhamru	-0.38	-1.01	0.32	-0.01
386.		Kotra	-0.35	1.88		
387.		Raipur-Pz	-1.74	-2.90	-0.64	
388.		Ralla	-0.14			-1.95
389.	Moga	Baje Ke-Pz	-4.07	-3.56	-2.06	-1.08
390.		Budh Singh Wala-Pz	-0.65	-3.01	-0.99	-0.91
391.		Chogawan-Pz	-0.17	-3.26		-1.16
392.		Dagru- Pz	0.05	-2.62	0.25	-0.82
393.		Damru Khurd	0.06	-3.47	-0.73	-1.43
394.		Darapur				
395.		Darapur 07pz	-0.34	-0.99	-0.47	-4.60
396.		Daulatpur Niwan-Pz	0.12	-1.73		
397.		Himatpura-Pz	-0.7	-2.75		
398.		Jhandewala-Pz	0.08	-2.42		
399.		Khokri Kalan-Pz	0.34	-1.96		
400.		Mangewala-Pz	0.26	-2.14		
401.		Nihalsinghwala-Pz	-0.55	-2.99	-1.20	-2.01
402.		Raonke Kalan-Pz	2.5	-3.00		
403.		Samalsar-Pz	0.35	-1.05		
404.	Muktsar	Abulkharana		-0.44		
405.		Abulkharana-Pz	-0.32			
406.		Balocha Khera(Rasoolpur)	-0.76	-2.13	-0.57	0.65
407.		Bariwala-Pz	0.03	0.43		
408.		Bhaliana	0.21	-0.86	-0.69	-0.68
409.		Bhiti Wala-Pz	-0.23	-0.55		
410.		Doda			-0.62	
411.		Doda-Pz	0.14	-0.09	-0.61	
412.		Jhurar-Pz	-0.25	-0.98		

413.		Kabar Wala	0.14	-0.88		-1.27
414.		Khunde Halal-Pz	0.15	-0.98	0.02	
415.		Killian Wali-Pz	-0.44	-0.50		
416.		Kollian Wali-Pz	-0.15	-0.25		
417.		Kuttianwali	0.5	0.85	-0.08	
418.		Labanianwali	-0.05	-1.01	0.01	0.02
419.		Lambi	1.3	0.67	1.52	-2.88
420.		Lambi-Pz	1	-0.01	-0.99	
421.		Muktsar	1.41	0.06	-0.67	-0.58
422.		Phulu Khera-Pz	-0.28	-0.36		
423.		Ratta Khera Chota-Pz	0.02	0.02		
424.	Nawanshahr	Baharam-Pz	0.25	-1.00		
425.		Bahlora Kallan- Pz	0.3	0.52	0.31	0.26
426.		Bahua-Pz	1.1	-0.50		
427.		Balachore				-0.61
428.		Kariam-Pz	-0.6	-1.20		
429.		Mauhra-Pz	-0.12	0.01	-1.75	-1.34
430.		Rahon	-0.03	0.41	0.32	0.13
431.		Raipur Dhaba-Pz	-0.2	1.07	0.04	0.12
432.	Patiala	Antala	0.55	3.00	-0.36	3.91
433.		Banur 07pz	-0.5	0.55	0.35	1.07
434.		Bhankhar-Pz	-0.9	-1.90		
435.		Bhojo Majri 07pz	-1.13	-1.41	-0.41	-1.28
436.		Binzal-Pz	0.85	0.40		
437.		Birkauli	-0.62	-3.88	-1.18	-2.22
438.		Chandiala-Pz	-0.05	-0.70		
439.		Chhat	-0.7	0.80		2.37
440.		Dera Bassi 07pz	0.15	-0.90	-1.41	-2.63
441.		Devigarh	-0.27			
442.		Devigarh 1pz	0.46		-2.38	-2.69
443.		Devigarh Iipz	0.43		-2.04	-2.38
444.		Devigarh-Iii Pz	0.34		-1.65	-2.03
445.		Dhakdaba 07	-1.02	-1.62	-1.51	-3.52
446.		Gholu Majra 07pz				1.10
447.		Haluka	-0.37	0.47	-0.40	0.23
448.		Handesaran-S	1.35	0.15	0.65	
449.		Harion Kalan-Pz	1.2	1.90		
450.		Joli	0.9	1.40	-1.80	-0.43
451.		Kakrala-Pz	-2	-1.90		
452.		Kalyan 07pz	-1.02	-2.52	-2.87	-1.98
453.		Kami Kalan	0.62			0.22
454.		Kutha Kheri-Pz	0.45	-0.05		

455.		Lacharu Kalan	0.5	0.03	-1.90	-2.06
456.		Lachkani-Pz	-0.08	-1.24	-0.95	-1.08
457.		Miranpur- Pz	-3.22	-5.73	-0.61	-3.67
458.		Mirapur				-0.65
459.		Nanhera-Pz	0.6	-0.30		
460.		Nariana	1.45		-1.66	
461.		Patran-Pz	0.37	0.03	-0.07	0.76
462.		Rajpura Pz M				
463.		Samana-Pz	-1.39		-2.22	-2.80
464.		Samaspur-Pz	-1.45	0.40		
465.		Sangatpura-Pz	-0.75		-1.43	-1.86
466.		Singhpura-Pz	0.3	-0.50		
467.		Sirsini			0.06	0.03
468.		Sundran-Pz				
469.		Thua	-2.44	-4.24	-1.35	-4.53
470.	Rupnagar	Ahmedpur	0.7	-1.80	-1.44	-2.41
471.		Bera Chauta	1.14	0.70	-0.85	0.38
472.		Bhalan	0.74	2.19	-1.02	1.37
473.		Braham Pur	0.59	2.80	-0.29	2.43
474.		Chakdera	-0.28	0.65	-0.46	0.57
475.		Chanalon			-2.13	
476.		Chatamli- Pz	5.19	-0.40	0.80	-6.52
477.		Dhair	-1.8	-3.22	-1.21	-0.10
478.		Dheri	0.32	1.00		0.04
479.		Dumewal	-1.3	0.60	-1.83	0.59
480.		Dusarna	0.14			
481.		Gharoon	2.45	1.65		
482.		Ghoga	0	0.45	-2.01	-0.65
483.		Hardinamoh	-0.12	1.90	-0.25	0.61
484.		Kakrali			-1.74	
485.		Kurrha-Pz	0.8	0.25		
486.		Landran-Pz	0.4			
487.		Raipur Kalan	0.3	-0.80		
488.		Rurki Heeran-Pz	1.69	0.61	-0.60	-2.46
489.		Soara	2.59	1.80	-1.28	-0.45
490.	Sangrur	Bagarian-Pz				-1.17
491.		Bapla-Pz	0.03	-0.39	-1.03	
492.		Barnala (S)	-1.19	-2.32		-2.87
493.		Bhadaur-Pz	-1.77	-4.11		-3.08
494.		Bhojowali-Pz	-1.66	-4.25	-1.42	-2.20
495.		Bugra 1	-0.45	-5.82	-1.3	
496.		Chural Kalan M	-0.68	-1.58	-1.7	-2.91

497.		Dharamgarh-Pz	-0.28	-0.95		
498.		Gahl 07pz	-1.36		-1.79	
499.		Gehlon-Pz	-0.1	-1.30		-0.65
500.		Ghanauri Kalan-Pz	3.33	1.95	-0.85	-0.44
501.		Hassanpur-Pz	-0.22	-0.64		
502.		Kala Jhar-Pz	-0.7	-1.40		
503.		Kuler Khurd-Pz	-0.02	-0.38		
504.		Kurar-Pz	0.4	-2.90		
505.		Ladda-Pz	-1.27		-1.06	-2.26
506.		Lehal Kalan-Pz	0.12	-0.22		
507.		Longowal-Pz	-0.81	-2.20	-1.43	-1.43
508.		Mahal Kalan-Pz	-0.87		-3.12	-2.67
509.		Malerkotla-DW	-1.11	-1.93		
510.		Manvi-Pz		-0.12		
511.		Mastuana-Pz				1.21
512.		Mehsampur 07pz	2.55			
513.		Mehsampur-Pz	-0.43	-0.78		
514.		Nangal-Pz	1.3	-0.90		
515.		Panjgaraian- Pz	-0.27	-0.63		
516.		Ramgarh-Pz	-1	-1.90		
517.		Rampur Channa-Pz	-0.68	-1.20		
518.		Rurki Kalan-Pz	0.2	-0.11		
519.		Sunam-Pz	4.28	2.80	-1.57	-1.55
520.		Tappa Mandi-Pz	0.78	-1.82		
521.						

S. NO.	DISTRICT	GWOW LOCATION	Decadal Mean fluctuation (m)			
			May (2004:2013)	August (2004:2013)	November (2004:2013)	January (2005:2014)
			May 2014	August 2014	November 2014	January 2015
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	CHANDIGARH	BURAIL	0.17	-0.00	0.12	-0.36
2.		Csio-combined	-0.15	0.75	3.51	0.29
3.		CSIO-S	1.89	0.60	0.84	1.25
4.		MaloyaPZM	0.06	1.37	1.29	1.18
5.		NEW INDUST AREA	1.36	2.50	1.69	1.68
6.		Sec-27, Ar Well	7.36	1.34	1.14	3.66
7.		Sec-27, CGWB Building		14.32		
8.		SECT 10C (D)	2.02	-1.79	1.54	2.74
9.		SECT 10C (S)	-0.45	-1.11	0.09	-2.95
10.		SECT 21D (S)	0.74			-0.05
11.		SECT 31D (D)	-1.29	-0.98	-0.01	0.67
12.		SECT 31D (S)	-0.03	-6.53	0.84	-0.25
13.		SECT 37D (S)	-0.43	0.39	0.75	0.15
14.		SECT 39D (S)	0.19	0.78	1.38	-0.18
15.		SECT 44D (S)	0.04		0.87	0.43
16.		Sector 52- PZ	-5.48	0.13	0.13	-2.73
17.		Sector-46 (shallow)	-0.29		0.45	
18.	AMRITSAR	Aima Khurd-Pz	0.10	-0.06		
19.		Ajnala	0.20	0.68	-0.21	0.11
20.		Aminshah Khalra	0.61		1.51	2.29
21.		Amritsar1	1.11	2.04	0.98	3.83
22.		Bakipur-Pz				0.26
23.		Bal Kalan-Pz				2.00
24.		Bath-Pz				0.08
25.		Beas07	0.14	0.75	0.10	0.61
26.		Bhagala-Pz				0.90
27.		Bhalaipur-Pz				0.40
28.		Bhankar Kalan-Pz				0.02
29.		Bhattaywad-Pz				0.40
30.		Bhikiwind- Pz	-0.30	0.70	-0.08	0.89
31.		Bhura-Pz				-0.05
32.		Bhure-Pz				0.45
33.		Bhusse-Pz				0.14
34.		Boparai Khurd-Pz	-0.65	-1.55		0.25

35.		Brahmpur-Pz				0.10
36.		Burjwal-Pz				0.31
37.		Chabal 07	0.34	0.59	1.22	1.22
38.		Chak Dogra-Pz				0.10
39.		Chakkare Khan-Pz				0.30
40.		ChogWan- Pz	-1.29	0.63	-1.09	-0.16
41.		Chola Sahib-Pz	0.07	0.77	-0.25	0.32
42.		Choudhary Wala-Pz				0.00
43.		Chuselawad-Pz	0.38	-0.04		0.56
44.		Dhariwal-Pz				0.15
45.		Dholan-Pz				-0.19
46.		Dhulika-Pz				-0.50
47.		Dohan-Pz				0.60
48.		Ekalgoda-Pz				0.30
49.		Gago Mahal- Pz	-0.90	-0.10	-1.20	-0.79
50.		Gandi Wind-Pz	-0.78	0.44	-0.09	0.20
51.		Gill wali-Pz				1.80
52.		Goindwal 07	-0.34	0.74	-0.43	0.38
53.		Gujjaran Wali-Pz				0.90
54.		Harike			1.27	
55.		Jandiala Guru-Pz	-0.40	0.29		0.48
56.		Jandoke-Pz				-0.78
57.		Jasrur-Pz				0.10
58.		Jethuwal-Pz				0.10
59.		Kalsia Kalan07	0.44	1.70	-0.25	
60.		Karyal-Pz				1.00
61.		Kandowali-Pz				0.50
62.		Khadur Sahib-Pz	-0.39	-0.57	-0.19	0.53
63.		Khalra-Pz				1.00
64.		Khilchian-Pz	-0.20	-0.20		1.10
65.		Kotbudda-Pz				0.00
66.		Kotli Sur Singh-Pz	0.65	0.15		0.61
67.		Majitha- Pz	1.10			
68.		Mahendipur-Pz				0.22
69.		Mahima-Pz				-0.20
70.		Makhan Windi-Pz				1.30
71.		Marhona-Pz				0.14
72.		Mari Kamboke-Pz				-0.19
73.		Mehleykey-Pz				-4.70
74.		Mehta			0.71	0.25
75.		Miran Chak-Pz				1.80

76.		Mohawa	0.85	1.90	0.18	1.50
77.		Nangal Sahaul-Pz				-1.00
78.		Nawan Tanal- Pz	-1.29	0.75	-0.66	0.12
79.		Pakharpura-Pz				0.40
80.		Pindan-Pz				1.06
81.		Rajoke-Pz				-0.06
82.		Rampura-Pz	-1.72	-2.40		1.80
83.		Ratoke-Pz	-1.33	1.59	0.47	0.27
84.		Rupowal Brahmana-Pz	0.45	0.35		0.65
85.		Sabran-Pz				-0.10
86.		Sahab Pura- Pz	1.55	1.28	-1.21	0.86
87.		Sathiala-Pz				0.60
88.		Shabura-Pz				-2.70
89.		Sham Nagar-Pz				-0.30
90.		Sheron-Pz				-0.18
91.		Talwandi Dogra-Pz	2.50	-1.00		1.90
92.		Thatha- Pz	0.65	0.02		3.00
93.		Thatha- Pz				0.52
94.		Ugar Aulakh-Pz				6.20
95.		Vadala Kalan-Pz				0.60
96.	BATHINDA	Ablu	-1.95	-0.17	0.48	2.09
97.		Badiala-Pz	1.28	1.30	2.43	1.51
98.		Bagher Mohabat Singh-Pz				0.07
99.		Bahman Kaur Singh-Pz				0.11
100.		Balianwali-Pz				3.87
101.		Balluana1	0.19	0.68	0.48	0.83
102.		Balluana-Pz				1.02
103.		Banbhiha-Pz				-0.02
104.		Bhagibandar	-0.19	0.29	0.06	-0.05
105.		Bugran-Pz				2.44
106.		Burj Gill-Pz				1.46
107.		Burj-Pz				-0.16
108.		Deratapp	0.87	1.56	0.96	0.19
109.		Dhapali1	6.17	7.33	6.97	7.96
110.		Dhapali-Pz	1.71	2.21	2.30	1.26
111.		Dialpur Mirza	4.25	6.06	5.30	4.79
112.		Dialpura Bhlaike	4.36	5.50	4.90	4.76
113.		Dulle Wala-Pz				1.96
114.		Gill Patti-DW	0.26	1.06	1.05	0.78

115.		Gulabgarh 2 (s)	0.95	3.02	1.49	1.09
116.		Guru Sar-Pz	-1.19	4.88	-0.29	0.05
117.		Harraipur-Pz				0.35
118.		Jajjal	-1.03	-0.74	-0.93	-0.38
119.		Jassi Bhagwali	-2.80	-1.69	-2.92	-2.31
120.		Jassi Paowali-Pz				0.39
121.		Jhanduke	2.85	5.28	5.33	
122.		Jhanduke-Pz				1.86
123.		Kahan Singh Wala-DW	0.31	1.44	1.42	1.37
124.		Kalla Bandar	-4.21	-3.18	-3.87	
125.		Kalyan Sukha-Pz				2.42
126.		Kot Bhaktu-Pz				0.10
127.		Kot Fatta				1.58
128.		Kot Guru				-0.21
129.		Kot Shamir	1.12	7.94	0.92	-0.36
130.		Kothaguru-Pz	1.41	1.18	1.36	1.46
131.		Lahri	0.01			
132.		Lalliana-Pz				0.78
133.		Lehra Dhulkot-Pz				3.18
134.		Lehra Khanna-Dw	1.11	2.10	3.16	3.31
135.		Maisar Khana	1.61	2.51	2.08	
136.		Maisar Khana-Pz	0.22		-0.16	-0.31
137.		Mandi Kalan-Pz				4.47
138.		Mehraj-Pz				1.84
139.		Mehta-Pz				-0.36
140.		Multania-Pz				-0.27
141.		Nahinwala	1.34	2.31	2.52	2.64
142.		Nathana-Pz				1.68
143.		Nathena-Pz				-0.28
144.		Phul	5.58	5.89	6.71	7.18
145.		Phulla1	2.16	3.95	3.87	3.65
146.		Puhla-Pz	0.13	2.16	2.78	1.46
147.		Raike Kalan	-1.90	-0.68	-1.40	-1.35
148.		Rajgarh Kubey-Pz	0.32		-0.24	-1.39
149.		Rampura	7.53	6.98	7.13	8.47
150.		Rayya-Pz				2.46
151.		Sangat -Pz	-1.38	-0.13	-0.44	-0.47
152.		Seema-DW	0.10	2.47	1.52	1.07
153.		Sidhana				3.74
154.		Sooch-Pz				2.49
155.		Teona-Pz		0.29	0.82	0.75

156.		Tungwali-Pz				1.01
157.	FARIDKOT	Bead Sikhanwala-Pz	-0.75	1.19	-0.16	-1.15
158.		Behabal Kalan-Pz				0.10
159.		Burj Jawahar Singh-Pz	0.73	0.93	2.68	1.78
160.		Chahd Baja	0.47	1.48	1.07	0.64
161.		Chak Kalan-Pz				-0.30
162.		Devrana-Pz	-1.43	-2.25	-0.52	0.08
163.		Dhaipai-Pz	0.19	-0.48	-0.33	0.15
164.		Dhilwan Kalan	0.50	1.56	2.56	0.94
165.		Dhudi-Pz				0.05
166.		Dipsinghwala	0.89	1.45	0.99	1.29
167.		Fatehgarh-Pz				0.10
168.		Ghuiana-Pz				-0.30
169.		Karirwali	-0.64	0.11	0.21	1.88
170.		Koharwala- DW				0.10
171.		Kot Kapura	3.32	1.77	1.21	0.41
172.		Matta	2.76	2.38	1.73	1.00
173.		Mehmuana	-1.61	-0.52	-1.46	-1.42
174.		Pahluwala-Pz				0.35
175.		Ratti Rori-Pz				-0.30
176.		Rorian Kapura-Pz				-0.10
177.		Sandhwan-Pz				0.20
178.		Sher Singh Wala-Pz	-1.93	0.40	0.00	-0.46
179.	FATEHGARH	Amloh1	2.22			
180.		Badalialasingh	1.92		4.69	4.71
181.		Bagga Kalan	0.13	1.50	1.72	1.92
182.		Bassi Pathana	1.95	4.86	5.81	0.68
183.		Bhagrana	-1.31	-0.48	0.53	-0.02
184.		Bhateri1	2.90	4.20	4.59	4.41
185.		Burj	-0.20	2.03	2.05	1.93
186.		Chunni Kalan	-1.82	-0.43	0.49	0.72
187.		Fatehgarh Sahib	0.33	0.37	0.87	0.60
188.		Fatehgarh Sahib-Pz	1.31	2.32	2.37	2.47
189.		Jai Singh Wala	-0.50	0.93	2.60	2.58
190.		Jhambela	0.07	1.55	2.33	2.13
191.		Khara	2.94		8.78	8.20
192.		Lohar Majra	1.03	2.15	2.83	2.80
193.		Nalini-Pz	0.81	3.09	1.28	0.97
194.		Pawala	-0.41	2.52	1.91	1.18

195.		Sado Majra	0.25	1.20	1.93	1.68
196.		Shahpur	1.30	2.68	2.83	2.60
197.		Tahalpur	0.02	1.23	2.87	3.00
198.		Talwara	0.22	1.80	1.90	1.69
199.	FIROZPUR	Abohar	-0.16	-0.63	-0.20	-0.07
200.		Alamgarh	-0.58	0.07	-0.77	-0.45
201.		Asifwala-Pz	0.07	-0.47	0.59	0.21
202.		Baman Wali-Pz	0.97	1.03	1.42	1.30
203.		Bannawala	-1.00	-2.97	-1.59	-1.30
204.		Bara Mansur Wala-Pz	-0.10			1.40
205.		Bazirdpura	-1.65		-1.80	-1.72
206.		Chamb-Pz	1.05	0.26	1.78	1.39
207.		Danewal Satkosi	-1.39	-2.55	-0.40	-0.38
208.		Dipulana-Pz	-0.72	-0.31	-0.82	0.00
209.		Fattu Wala-Pz	-0.22	-1.19	1.31	1.56
210.		Fazilka-Pz	-1.57	-1.06	-0.83	-0.76
211.		Ghananga Kalan-Pz	0.16	0.12	0.53	0.88
212.		Giddran Wali-Pz	-1.39		-0.94	-1.30
213.		Gogiani-Pz	0.62	-0.13	1.58	0.61
214.		Guru Harsahai-Pz	0.19	-0.16		1.08
215.		Hamed Saidoke-Pz	-0.67	-1.30	0.49	-1.70
216.		Himmatpura-Pz				0.29
217.		Jaimal Singhwala Pz	-0.94	0.17	-0.55	-0.55
218.		Jand Wala Johian-Pz	-0.18	-0.28	-0.38	0.45
219.		Jandwala Watan-Pz	0.12	1.40	0.04	0.30
220.		Jang-Pz	0.42	-0.15	0.70	0.62
221.		Jhottian Wali-Pz	0.12	0.65		
222.		Jodhe Wala Bhaini-Pz	0.13	-1.85	0.97	-0.42
223.		Kahan Singh Wala-Pz				1.15
224.		Kandh Wala-Pz	-0.87	-1.53	-0.83	-0.78
225.		Khan Wala-Pz				0.14
226.		Khere Ki Uttar-Pz	-0.37	-0.64	0.28	-0.37
227.		Khuiansarwar- Pz	-0.30	-0.11	-0.46	-0.41
228.		Kundal1	-0.87	-0.51	-1.53	-1.12
229.		Ladhuwala	0.13	-0.08	0.19	0.20
230.		Lauhke Kalan- Pz	-0.05	0.09	0.65	-0.15
231.		Lohere Khurd-Pz	-0.48			0.22
232.		Machi Bugra/ Gujran-Pz				0.85

233.		Mallanwala Khas-Pz	-0.10			0.05
234.		Malluwala-Pz	0.94	1.65	2.57	2.24
235.		Malsian-Pz	0.30	1.17	0.44	0.67
236.		Malukpur-Pz				0.22
237.		Mana Singh Wala-Pz	-0.07	0.13	-0.05	0.32
238.		Markhiwa Bhamni-Pz	0.04	0.14	0.42	0.20
239.		Mohkam Khan Wala-Pz				0.42
240.		Mohre Wala-Pz	-0.61	0.62	-0.18	-0.76
241.		Motiwala 07pz	-0.61		0.62	
242.		Mudki-Pz				0.15
243.		Mullian Wali-Pz	0.17	0.37	-2.02	0.35
244.		Muradwala Dal-Pz				0.64
245.		Nihalkhera	-1.80	-0.52	-0.59	-1.55
246.		Nure-Ki-Uttar 07pz	-0.67	0.29	0.39	-0.67
247.		Pancha Wali-Pz	0.01	-0.20	-0.58	0.32
248.		Pattiwalla-Pz	-0.84	-0.86	-0.61	-0.82
249.		Piyarana	-0.94	-1.19	0.83	-0.39
250.		Ramsara-Pz				0.22
251.		Roran Wala-pz	0.01	0.43	-0.28	0.90
252.		Rukne Wala-Pz				1.70
253.		Sadhusha Wala-Pz				0.58
254.		Sham Singhwala-Pz	-0.15	0.71	-0.41	-0.27
255.		Shatriwala-Pz	-1.17	-1.06	0.61	-1.00
256.		Sherewala-Pz				0.42
257.		Singhpura-Pz	0.32	0.46	-3.58	0.34
258.		Sitoganno	-3.64	-3.24	0.35	-3.69
259.		Sohangarh Ratte	-0.12	0.66	-0.59	0.55
260.		Swah Wala- Pz	-0.39	0.03		-0.45
261.		Talwandi Jalle Khan-pz	0.40			1.27
262.		Tibbi Taiwan Laluwalla-Pz	-0.06			0.76
263.		Wage Wala-Pz				0.25
264.		Waryam Khera			-0.64	-0.48
265.	GURDASPUR	Aulakhkalan	-0.75		0.48	0.05
266.		Bamyal	-0.87	1.22	0.08	0.03
267.		Bhagowal	0.39	1.60	-1.70	0.45
268.		Bham	0.42	1.91	0.56	0.23
269.		Bhoa	-0.28	0.14	0.01	0.13
270.		Bilasbal-Pz	-1.00			

271.		Chahal Kalan-Pz	0.11	0.96	0.65	0.96
272.		Chone-Pz	1.24	1.54	1.92	1.86
273.		Dakoha-Pz	-0.87	-0.10	-0.13	0.44
274.		Dera Baba Nanak	-1.46	-0.35	-1.38	-2.05
275.		Dhianpur	2.02		-0.33	2.82
276.		Dinanagar	-0.55	0.51	0.28	0.01
277.		Gajikort-Pz	0.80			
278.		Galri	-0.18	1.68	1.50	0.61
279.		Ghania Ki bangar-Pz	-0.76	0.09	-0.58	-0.43
280.		Gharotakalan	-1.91		-1.89	-1.49
281.		Ghoh			-5.16	
282.		Ghoh DW	-8.30	-6.89	-5.38	
283.		Ghumani Khurd-Pz	-1.00			
284.		Gurdaspur-Pz	-2.10			
285.		Harchowal-Pz	-0.32	-0.15	0.43	1.06
286.		Hargobindpur	-0.09	-3.12	0.44	0.37
287.		Jhakolahri	0.39	0.04	-0.13	-0.18
288.		Jhandalbana-Pz	-0.30			
289.		Kala Afgana-Pz	-1.15			
290.		Kalanaur-DW	-1.49	-0.46	-0.46	-0.39
291.		Kalanaur-Pz	-2.12	0.71	-0.43	-0.10
292.		Kaure-Pz	-0.85			
293.		Khanikhui	-0.29	0.14		-0.05
294.		Khanmalik-Pz	-1.80			
295.		Khatgarh-Pz	-0.60			
296.		Langurwal-Pz	-0.60			
297.		Madipur	-0.22	1.92	1.12	1.03
298.		Malikpur-Pz	0.04	2.30	1.68	1.16
299.		Mallewal-Pz	0.23	0.51	0.57	1.37
300.		Masana-Pz	-0.39	0.23	0.49	0.83
301.		Massit-Pz	0.14	0.85	0.69	0.45
302.		Mirza Jaan-Pz	0.78	0.83	1.30	1.38
303.		Mullowali 1(vs)	-0.63	0.62	-0.36	-0.81
304.		Mullowali 2(m)	-1.23	-0.03		-0.49
305.		Nangal-Pz	-0.80			
306.		Nawan Pind	-0.62	-0.35	0.50	-0.19
307.		Nishayara	-0.78	1.16	-0.32	-0.15
308.		Pandoritalab	-0.72	-2.11	-0.53	-0.56
309.		Parcha-Pz	-0.95			
310.		Pathankot1	0.63	2.02	-0.01	-0.51
311.		Saleh Chak-S	-1.14	2.43		0.47

312.		Salehchak(vs)	-1.10	1.80	0.93	0.30
313.		Sarna1	0.60	-0.87	0.20	-0.28
314.		Sathial-Pz	-0.02	0.19		0.37
315.		Shahpur Jattan-Pz	-1.55	-0.59		
316.		Shikar-Pz	-0.88			
317.		Tikriwala-Pz	-1.05			
318.	HOSHIARPUR	Adowal Garhi-Pz	1.40	1.82	3.32	2.54
319.		Bhamnaur	0.00		2.22	2.34
320.		Chohal	0.31	0.17	0.21	-2.19
321.		Dasuya2 (s)	0.79			1.37
322.		Durimiwal	-0.23	1.54	0.65	0.54
323.		Garh Di Wala-Pz	1.05	5.21	1.61	2.42
324.		Garhshankar (s)	1.58		4.42	4.94
325.		Hazipur	-0.58	1.07	0.01	-0.21
326.		Mahilpur-Pz	1.40	1.79	2.06	3.45
327.		Mukerian Dw	-0.23			0.75
328.		Nangal Bihala- DW	0.34	4.07	1.99	1.57
329.		Phuglana- Pz	-3.52	-0.80	-0.30	0.82
330.		Rampur Colony (HSP) pz-medium	1.70		1.42	0.50
331.		Sham Chaurasi	-1.00	0.37	-1.06	-0.99
332.		Simbli- OW				1.09
333.		Simbli-Pz	-1.28		1.60	-0.37
334.		Talwara1	-0.03	0.14	0.36	0.68
335.		Thakarwala	0.65	1.17	1.42	1.03
336.	JALANDHAR	Adampur 3(s)	0.79	1.34	0.65	-1.04
337.		Adarman-Pz	-0.88	0.47	0.91	0.33
338.		Allawalpur	-0.57	2.07	1.30	2.75
339.		Billi Chahrami-Pz	-2.24	0.13	-0.14	-1.40
340.		Gohiran				3.98
341.		Hardo Pharwal-Pz	2.06	5.00	5.86	2.95
342.		Jalandhar 3(vs)	5.05		4.20	
343.		Jalbhe	-1.42		7.02	
344.		Jandiala-Pz	-2.25	1.20	0.68	0.66
345.		Kalyanpur-Pz	1.71	2.00	2.05	1.87
346.		Kartarpur 2(s)	2.14	0.35	0.85	1.63
347.		Kharal Kalan Pz-S	0.80	3.90	2.48	1.85
348.		Lallian kalan Pz-S	2.43	0.17	1.53	2.66
349.		Nakodar 2(m)	1.88	2.51	3.76	4.01
350.		Nakodar 3(s)	2.59	3.33	3.86	2.15
351.		Nangal Shaman	0.83	2.47	0.88	0.31

352.		Nasirpur-Pz	-0.80	0.63	0.50	0.53
353.		Nussi-Pz	-3.14	-0.60	-2.22	-3.85
354.		Phillaur 2(s)	-0.24	0.63	0.53	0.26
355.		Rurka Kalan- Pz	-5.18	-1.10	-2.10	-2.53
356.		Sarih Pz-S	1.34			
357.		Shahkot(s)	0.98		1.82	
358.		Talwandi Bhutial-Pz	-1.21	1.43	1.17	1.25
359.		Talwan-Pz	0.24	1.35	0.83	0.37
360.		Udhopur			1.00	0.76
361.	KAPURTHALA	Bauril Harnampur-Pz	0.28	1.52	1.15	1.19
362.		Bhatnura Khurd- S	-0.76	2.36	1.09	-2.95
363.		Bholath M	-0.18	1.58	0.89	0.58
364.		Bholath S	0.16	1.11	0.99	0.91
365.		Chakoke-Pz	-0.53	0.69	0.38	-0.20
366.		Dalla	0.86		2.93	2.90
367.		Hamira-Pz	0.58	0.65	0.60	0.58
368.		Hazipur-Pz	0.40	1.83	0.23	0.73
369.		Kapurthala2 (s)	1.32	3.27	1.82	3.16
370.		Karnail Ganju-Pz	0.42	0.59	0.92	0.32
371.		Kishanpur	0.10	8.55	1.08	0.80
372.		Miani Bola-Pz	0.27	0.31	0.13	0.19
373.		Nadala	0.02	0.18	0.11	0.05
374.		Nathu Chahal-Pz	0.09	2.88	0.95	1.87
375.		Nurpur Janoa-Pz	0.13	0.07	0.30	0.17
376.		Phagwara2 (s)	1.26	4.99	3.11	3.95
377.		Sheikh Manga-Pz	-0.37	0.48	0.83	1.20
378.		Sultanpur2 (s)	1.04	4.13	-0.09	1.83
379.		Talwandi Chaudary -Pz	-0.46	1.04	0.45	0.59
380.	LUDHIANA	Begowal	0.38	0.92	0.99	0.91
381.		Bhahlolpur-DW		1.11	0.61	0.27
382.		Chattar Singh Park-ldh	5.57			
383.		Doraha-Pz	1.47	-0.17	-0.37	-0.28
384.		Gopalpur 2(s)	2.67		4.72	4.58
385.		Habbowal	1.32			
386.		Harnampur	0.12	3.88	2.43	1.09
387.		Ikloha-Pz	1.14	1.56	1.16	1.94
388.		Jagraon 2(s)			2.62	
389.		Kadon-Pz	-0.94	8.01		
390.		Kalsian	1.90	4.17	4.58	3.87

391.		Khandur	1.17	2.93	2.63	2.17
392.		Lalan1	0.25	0.94	2.03	2.03
393.		Lil- II Pz	2.64		3.30	3.78
394.		Lil-Pz III	-1.34		-1.30	-0.16
395.		Maksudra-Pz	-1.36	0.79	0.53	0.48
396.		Mushkabad	0.31		1.03	0.97
397.		P.A.U.Ludhiana 2(s)	-1.23	0.73	1.53	-0.39
398.		Punjeta	0.33	0.27	0.33	0.95
399.		Rajona Khurd	0.65	3.81	3.24	2.34
400.		Rashin	1.75	4.38	4.26	3.42
401.		Samrala 2(s)	1.29		1.92	0.74
402.		Sherian	-0.71	-0.56		0.08
403.		Sidhwan Bet-Pz	-1.87	0.99	0.22	0.46
404.		Upplan	0.30	0.62	1.83	1.80
405.		Utlan	-1.95	-1.29		
406.	MANSA	Bhikhi 2 (s)	2.42			
407.		Budhlada	2.12	2.05	-2.41	
408.		Budhlada-Pz		2.14	1.20	1.69
409.		Burj Bhalaike	-0.44	0.22	-1.68	-0.17
410.		Fattamaluka	-0.28	0.32	0.38	0.23
411.		Kot Dhamru	0.74	1.07	0.45	0.52
412.		Kotra	1.85	-0.66		
413.		Raipur-Pz	0.64	0.66	0.42	
414.		Mansa				1.43
415.		Ralla	1.68			2.37
416.	MOGA	Baje Ke-Pz	4.44	0.83	1.94	-2.13
417.		Budh Singh Wala-Pz	1.02	1.23	1.28	1.84
418.		Chogawan-Pz	0.81	1.17		1.32
419.		Dagru- Pz	0.52	1.37	0.52	0.92
420.		Damru Khurd	3.39	6.40	5.05	5.12
421.		Darapur	1.73		4.83	
422.		Darapur 07pz	2.25	2.85	4.45	6.35
423.		Daulatpur Niwan-Pz	1.16	1.88	2.24	1.44
424.		Himatpura-Pz	2.53	1.65	4.40	4.41
425.		Jhandewala-Pz	1.26	2.37	2.28	1.74
426.		Khokri Kalan-Pz	1.46	0.74	2.46	3.08
427.		Mangewala-Pz	1.13	2.40	2.47	1.96
428.		Nihalsinghwala-Pz	1.33	1.66	1.78	1.34
429.		Raonke Kalan-Pz	-0.83	1.53	4.60	4.71
430.		Samal Sari				
431.		Samalsar-Pz	0.69	1.23	3.84	0.00

432.	MUKTSAR	Abulkharana-Pz	-0.02	-0.33	0.29	0.01
433.		Balocha Khera(rasoolpur)	0.01	1.43	0.12	-1.00
434.		Bariwala-Pz	-0.02			
435.		Bhaliana	0.53	1.39	1.73	1.55
436.		Bhiti Wala-Pz	0.23	-0.08	0.47	8.23
437.		Chotian-Pz	-0.27	-0.23	0.20	0.42
438.		Dhalkot-Pz	0.00	0.21	0.56	-0.24
439.		Doda	0.63	-0.89	0.77	-0.01
440.		Doda-Pz	-0.14	-0.57	0.14	0.71
441.		Gaga-Pz	0.25	0.02	0.66	0.53
442.		Jhurar-Pz	0.13	1.17	0.80	0.58
443.		Kabar Wala	-0.70	0.23		0.54
444.		Khunde Halal-Pz	-0.15	0.04	-0.47	0.33
445.		Killian Wali-Pz	0.19	-0.19	0.44	
446.		Kollian Wali-pz	0.13			
447.		Kuttianwali	-1.00	-1.46	-1.21	
448.		Labanianwali	0.48	1.13	0.55	0.21
449.		Lambi	-0.83	-0.50	-0.89	0.92
450.		Lambi-Pz	-1.01	0.05	0.41	
451.		Muktsar	-0.90	0.97	-0.01	0.31
452.		Phulu Khera-Pz	-0.02	-0.38	0.30	0.08
453.		Ratta Khera Chota-Pz	-0.06			
454.		Sheikh-Pz	-0.80	-0.43	0.01	-0.32
455.	NAWANSHAHR	Baharam-Pz	0.53	1.89		0.41
456.		Bahlora Kallan- Pz	0.15	-0.49	-0.58	0.03
457.		Bahua-Pz	0.48	2.40	1.77	0.59
458.		Balachore	1.78	1.67		1.07
459.		Kariam-Pz	0.59	0.85	0.17	-0.12
460.		Mauhra-Pz	0.12	0.76	1.51	2.15
461.		Rahon	0.97	0.46	0.58	0.79
462.		Raipur Dhaba-Pz	1.06	-2.41	-0.21	0.38
463.	PATIALA	Antala	-0.98	-2.42	-0.01	-2.92
464.		Ballopur	1.94		2.33	1.30
465.		Banur 07pz	1.41	0.44	1.42	1.60
466.		Bassma Pipla	-1.65			
467.		Bhankhar-Pz	-1.03	-2.87	-3.58	
468.		Bhojo majri 07pz	2.67	2.95	3.41	3.59
469.		Binzal-Pz	0.90	0.05	-0.05	-0.54
470.		Birkauli	3.39	4.33	5.24	5.17

471.		Chandiala-Pz	-1.90	-1.91	-1.30	-1.51
472.		Chhat	0.18	-0.18		-1.69
473.		Dera Bassi 07pz	-2.17	-0.56	0.17	1.33
474.		Devigarh	2.31	3.57		6.35
475.		Devigarh 1Pz	2.27		3.32	6.03
476.		Devigarh IIPz	2.17		2.93	6.00
477.		Devigarh-III Pz	2.17		3.14	5.17
478.		Dhakdaba 07	3.49		4.60	-1.03
479.		Haluka	0.19	-0.56	-0.26	-0.63
480.		Handesaran-s	-0.76	0.87	3.85	
481.		Hari Majra	-0.60			
482.		Harion Kalan-Pz	3.28	4.73	4.86	5.03
483.		Joli	-2.39	-2.51	-1.63	-1.79
484.		Kakrala-Pz	3.19	4.67	3.74	4.45
485.		Kalyan 07pz	2.70	4.20	5.81	3.85
486.		Kami Kalan	-2.78		-0.46	-1.43
487.		Kulburcha-Pz	4.42	4.39	3.67	4.00
488.		Kutha Kheri-Pz	-2.24	-2.40	-3.32	-2.88
489.		Lacharu Kalan	-2.03	-1.08	-0.08	-0.38
490.		Lachkani-Pz	0.08	3.27	1.12	1.21
491.		Miranpur- Pz	2.95	0.10	2.34	4.92
492.		Mirpur-Pz	-2.44			3.92
493.		Nanhera-Pz	1.07	2.53	2.33	1.93
494.		Nariana	-0.20		2.05	
495.		Patran-Pz	1.61	2.27	0.96	1.19
496.		Rajpura Pz M	7.66	6.44		
497.		Samana-Pz	2.21		2.64	2.70
498.		Samaspur-Pz	1.96	-0.24	2.63	2.30
499.		Sangatpura-Pz	0.75	5.93	2.09	2.17
500.		Singhpura-Pz	4.90		2.17	3.02
501.		Sirsini	-1.92	0.19	-0.31	-0.49
502.		Sundran-Pz	-0.86			
503.		Thua	6.10	4.72	6.49	6.89
504.	RUPNAGAR	Ahmedpur	-1.57	1.49	0.68	1.65
505.		Bera Chauta	-0.20	0.35	0.82	-0.17
506.		Bhalan	-0.25	-0.92	0.34	-1.96
507.		Braham Pur	-0.35	-0.74	0.20	-2.54
508.		Chakdera	-0.09	-0.20	0.54	-0.54
509.		Chanalon	-1.71		1.82	
510.		Chatamli- Pz	3.86	9.81	-0.30	10.57
511.		Dhair	-0.67	2.04	1.05	0.37

512.		Dheri	-0.45	-0.34		-0.76
513.		Dumewal	1.46	-0.22	2.10	0.14
514.		Dusarna	-2.07			
515.		Gharoon	-2.27	-1.29	-2.23	-2.83
516.		Ghoga	-1.08	1.23	1.13	0.20
517.		Hardinamoh	0.40	-0.32	0.27	-0.75
518.		Kakrali	0.11	0.20	0.42	
519.		Kurrha-Pz	-1.31	-0.95	-2.95	-2.98
520.		Landran	-3.03			
521.		Landran-Pz	0.15			
522.		Nurpurbedi			1.42	0.67
523.		Raipur Kalan	-0.83	0.40	-0.23	-0.70
524.		Rurki Heeran-Pz	-1.49	-1.48	0.32	2.53
525.		Soara	-3.33	-0.30	0.56	-0.87
526.	SANGRUR	Bagarian-Pz		3.10	1.83	1.97
527.		Bapla-Pz	-0.01	-0.19		
528.		Barnala (s)	5.32	5.22	6.08	5.73
529.		Bhadaur-Pz	2.59	2.52	3.17	3.02
530.		Bhojowali-Pz	1.66	0.52	1.42	2.20
531.		Bugra 1	5.48	9.75	6.91	
532.		Chural Kalan M	5.23	4.82	6.12	7.16
533.		Dhanaula				5.28
534.		Dharamgarh-Pz	1.22	1.94	2.20	2.26
535.		Gahl 07pz	4.11		5.35	
536.		Gehlon-Pz	1.05	2.38	2.38	1.83
537.		Ghanauri Kalan-Pz	-3.33	-7.66	0.85	0.44
538.		Haryao-DW	4.72			
539.		Hassanpur-Pz	1.40	1.47	2.07	1.97
540.		Kala Jhar-Pz	2.13	2.73	3.05	2.86
541.		Kuler Khurd-Pz	0.26	0.88	2.25	2.69
542.		Kurar-Pz	1.64	3.30	4.03	3.33
543.		Ladda-Pz	2.17		1.96	3.61
544.		Lehal Kalan-Pz	1.39	1.29	2.33	2.21
545.		Longowal-Pz	1.43	1.71	1.43	2.37
546.		Mahal Kalan-Pz	1.80		2.94	2.49
547.		Malerkotla-DW	2.92	3.84		
548.		Manvi-Pz		1.33		
549.		Mehsampur 07pz	0.13		1.20	
550.		Mehsampur-Pz	0.51	1.20		1.22
551.		Nangal-Pz	0.68	2.39	1.93	1.18
552.		Panjgaraian- Pz	1.08	1.38	2.89	3.08

553.		Ramgarh-Pz	2.48	2.08	2.25	2.51
554.		Rampur Channa-Pz	1.06	1.61	2.95	2.94
555.		Rurki Kalan-Pz	0.90	1.00	2.90	4.08
556.		Sunam-Pz	-0.90	2.29	2.24	2.76
557.		Tappa Mandi-Pz	-0.80	2.65	2.76	1.99

Annexure V

Results of chemical analysis of water samples from NHS in Punjab (2014)

SR	LOCATION	WELL NO.	pH	EC in µS/cm at 25^{0}C	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H as $CaCO_3$	SAR	RSC in meq/l
					(----------mg/l----------)														
	DISTRICT-AMRITSAR																		
1	MAHOWA	44I-2C7	8.00	325	0	175	21	0	1.65	0.12	0.02	21	13	25	13	24	105	1.06	0.76
2	AMRITSAR	44I-2D3	7.40	905	0	349	69	32	75	0.24	0.03	51	41	79	14	25	294	2.00	-0.16
3	BEAS	44M-2B11	7.50	835	0	268	69	45	80	0.40	0.01	55	31	74	7.3	27	263	1.99	-0.85
4	AJNALA	44I-1D4	7.15	2032	0	349	160	352	186	0.42	0.01	130	46	220	32	30	515	4.22	-4.57
5	Ramdas		8.05	660	0	416	14	0	0.69	0.19	0.03	21	13	116	5.4	23	105	4.92	4.72
6	Gaggo Mahel	44I-ICP1	7.60	590	0	282	35	37	0	0.12	0.05	34	13	83	3.8	22	137	3.09	1.89
7	NAYA TANDEL	44M-2AP2	7.35	610	0	309	42	0	24	0.05	nd	59	26	33	6.3	28	252	0.90	0.02
8	JANDIALA GURU	44M-2A3	7.95	760	0	349	49	22	34	0.57	nd	25	33	91	9.8	28	200	2.80	1.73
9	CHOGAWAN	44I-2C2	7.60	1085	0	416	63	99	55	0.42	nd	29	46	134	21	25	263	3.60	1.57
	DISTRICT BARNALA																		
10	Dhanaula	44N-3C2	9.01	1222	158	388	47	10	26	0.69	nd	17	37	224	6.5	24	194	7.00	7.73
11	Badam		8.86	2033	85	461	253	190	191	0.81	nd	31	52	423	10	25	291	10.79	4.58
12	Tajokke	44N3BP1M	8.86	2033	79	448	36	70	35	1.69	nd	5.8	26	248	4.5	18	121	9.80	7.54
13	Gehlan	44N-2BP1	7.2	277	0	134	22	0	4.3	0.41	nd	25	15	7.6	2.4	9.4	126	0.29	-0.33
14	Tallewal	44N-3B6	8	380	0	214	25	0	2.4	0.67	nd	27	17	33	3.6	12	136	1.23	0.79
15	Dhilwan	44N-3B3	8.2	1123	0	267	152	60	86	0.3	nd	16	60	126	6.5	10	286	3.24	-1.34
16	Mahel kalan	44N-2CP2	8.6	840	53	127	148	25	37	0.47	nd	14	41	119	9.9	10	204	3.63	-0.24
	2. DISTRICT BHATINDA																		
17	NAHIANWALI	44J-3D3	9.10	1955	106	282	199	222	115	0.52	0.02	12	97	175	170	24	429	3.68	-0.43
18	DERA TAPPA	44J-3D4	8.93	555	40	121	21	70	5.35	0.71	nd	43	26	25	8.6	20	214	0.74	-0.97
19	ABLU	44J-3D6	8.60	770	26	67	78	158	14	0.16	nd	25	32	70	34	22	194	2.19	-1.90
20	RAIKE KALAN	44J-4C6	8.90	2515	79	215	319	285	259	0.8	nd	20	109	175	315	28	500	3.41	-3.81
21	JASSI BHAGWAL	44J-4D1	9.05	1470	53	242	92	125	245	1.12	nd	12	55	210	34	21	255	5.71	0.61
22	GARHI BUTTAR	44J-4D2	8.55	2540	26	40	482	496	39	0.54	0.02	61	97	350	10	23	551	6.49	-9.50
23	BALLUANA	44J-4D3	8.71	590	53	148	35	78	1.9	0.63	nd	8	42	66	8	18	194	2.07	0.34
24	GHUDA	44J-4D5	8.35	3710	13	228	560	895	249	0.98	0.03	65	278	290	160	24	1307	3.49	-21.94
25	GANGA	44J-3DP3	8.81	401	50	134	7	0	2.81	0.51	0.05	19	29	12	11	20	169	0.40	0.53
26	RAMPURA PHULLA	44N-3A2	9.25	2200	145	416	199	315	58	0.86	0.04	8	69	430	10	22	306	10.73	5.58
27	PHULLA	44N-3A3	9.05	1190	66	228	78	78	120	3.05	nd	16	12	150	145	16	92	6.91	4.15
28	DIALPUR BHALAIKE	44N-3A1	9.2	980	79	376	14	56	11	3.2	0.04	8	7	225	4	17	51	14.02	7.82
29	DIALPURMIRZA	44N-3A7	Leaked																
30	PHUL	44N-3A9	8.95	1545	79	201	255	135	28	0.39	0.03	20	55	250	11	23	276	6.54	0.41

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
31	MAISER KHANNA	44N-4A4	9.15	1380	106	322	113	82	89	2.1	nd	20	40	250	10	17	214	7.43	4.52
32	BHAGI BHANDAR	44N-4A5	9.28	3920	211	671	461	402	180	1	0.03	25	60	395	760	17	306	9.77	11.85
33	LAHRI	44O-1A2	9.20	4510	304	805	560	318	278	1.12	nd	41	55	1000	24	26	327	24.00	16.76
34	JAJJAL	44O-1A4	8.34	230	7	77	9	28	2.45	0.22	0.02	29	7	7	2.4	4.49	102	0.30	-0.53
35	JHANDUKE	44N-4A8	9.1	1000	66	215	78	148	65	0.65	nd	12	55	160	8.1	23	255	4.35	0.60
36	KHAILIWALA	44J-3DP1	8.92	1970	53	302	177	454	2.8	0.65	0.02	20	35	400	7	17	194	12.50	2.84
37	GULABGARH	44J-4DP1	9.00	3774	46	228	440	1202	1.08	0.78	nd	0	103	790	14	17	424	16.70	-3.20
38	LAMBI	44J-4C3	8.08	8308	0	54	2084	1435	176	0.62	0.05	33	690	700	160	13	2920	5.64	-57.46
39	SANGAT KALAN	44J-4DP2	8.38	3975	158	571	925	92	165	0.88	0.03	6	78	880	18	20	337	20.89	7.91
40	GURUSAR	44O-1AP1	9.46	5118	343	1121	404	615	202	4.3	0.05	6	56	1200	20	21	245	33.33	24.90
41	BADIALA	44M-4BP4	8.71	3105	59	517	255	765	85	1.06	0.02	14	36	720	12	23	184	23.15	6.78
42	KATH GURU	44N-3AP2	9.46	2381	139	638	156	252	28	1	nd	2	42	500	10	20	179	16.32	11.54
43	DHAPALI	44N-3A6	8.95	598	40	161	64	20	7.9	0.03	nd	20	35	54	6	18	194	1.69	0.10
44	KOT SHAMIR	44N-4A1	9.05	3030	158	376	383	298	359	0.91	nd	29	122	450	140	15	572	8.17	-0.05
45	KAILABANDER	44N-4A7	8.97	2120	66	148	262	395	178	0.6	nd	20	92	275	110	24	429	5.78	-3.94
	3. DISTRICT FARIDKOT																		
46	MEHMANA	44J-2C6	8.63	1912	53	54	248	505	37	0.55	nd	69	32	335	9	21	306	8.33	-3.48
47	KOTKAPURA	44J-2D2	8.97	1182	40	201	92	215	45	0.77	nd	16	32	196	25	13	174	6.47	1.15
48	CHANDBAJA	44J-2D5	9.16	1368	92	349	191	12	11	0.25	0.04	8	40	188	116	15	184	6.04	5.13
49	DHILWANKALAN	44J-2D9	9.32	2833	145	537	234	490	95	3.10	0.03	8	30	620	100	32	143	22.57	10.78
50	KARIRWALI	44J-3D5	8.75	5260	106	564	574	1450	35	3.25	0.02	16	74	1200	48	17	347	28.03	5.82
51	DEEP SINGH WALA	44J-2B4	9.12	943	66	268	43	118	12	0.64	0.02	4	15	210	4	17	71	10.81	5.17
52	Sher Singh(pz)	44J-2CP1	8.75	2630	53	121	397	625	32	0.73	nd	37	84	455	10	29	439	9.45	-5.03
53	Beed Sirkhawala(pz)	44J-2DP1	9.07	535	53	215	14	32	6.22	0.82	nd	8	42	59	6	19	194	1.84	1.40
54	MATTA		9.36	1448	106	483	64	158	35	2.75	nd	10	41	290	37	22	194	9.07	7.58
	4. DISTRICT FATEHGARH SAHIB																		
55	CHUNNI KALAN	53B-2C17	7.86	711	0	311	70	9	20	1.18	0	39	40	50	7	22	265	1.34	-0.14
56	FATEHGARH SAHIB	53B-2BP2	7.72	1220	0	526	63	56	58	0.56	0	47	31	89	148	27	245	2.47	3.73
57	BASSIPATHANA	53B-2B5	7.76	728	0	371	42	13	20	0.55	nd5	39	33	69	8.2	26	235	1.97	1.42
58	AMLOH	53B-2A4	8.08	1180	0	383	91	3	150	0.49	0.398	114	41	40	20	27	451	0.82	-2.78
59	BADLI ALASINGH	53B-2A4	7.75	750	0	430	35	13	0.24	0.93	0.033	47	29	81	7	25	235	2.29	2.32
60	BHGRANA	53B-2C16	7.12	2600	0	478	400	270	149	0.13	0	129	188	113	13	23	1098	1.49	-14.06
61	NALINI	53B-2BP3	7.53	840	0	347	56	75	31	0.18	0.011	71	29	75	8.2	24	294	1.89	-0.24
62	PAWLA	53B-2C11	8.14	2180	0	837	98	170	45	0.99	0.033	35	29	72	531	14	206	2.18	9.59
63	BHATERI	53B-2CP2	7.75	513	0	320	21	10	0	0.31	0	47	31	24	5.8	25	245	0.67	0.35

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
	5. DISRICT FIROZEPUR																		
64	NUREKEUTTAR	44J2BP3	9.17	1030	79	336	28	124	23	0.72	nd	8	35	200	8	20	163	6.81	4.88
65	PIYARANA	44J-1C8	9.15	1200	119	443	35	115	13	0.80	nd	65	2	260	8	18	174	8.59	7.75
66	LADHAWALA	44J-2B3	9.00	1560	66	201	163	320	24	0.73	0.03	20	45	235	100	20	235	6.67	0.81
67	RATTEWALA(SOHAI	44J-2B6	9.01	5790	119	268	752	1882	42	1.74	0.05	37	72	1380	80	22	388	30.49	0.61
68	NIHAL KHERA	44J-4A2	8.92	1302	53	188	149	228	6.59	0.44	nd	8	84	140	25	20	367	3.18	-2.50
69	ABOHAR	44J-4A4	8.50	8415	53	67	1524	2092	340	1.75	0.02	82	169	1750	46	17	898	25.41	-15.09
70	ALAMGARH	44J-4A5	8.75	2045	40	161	262	365	140	0.34	0.01	8	82	185	245	18	357	4.26	-3.18
71	WARYAM KHERA	44J-4A6	8.67	1820	40	134	248	430	1.77	0.88	nd	29	67	285	18	18	347	6.66	-3.42
72	DANEWALI SATKOS	44J-4A7	8.48	5604	40	94	943	1340	236	1.75	nd	86	164	1000	37	18	888	14.60	-14.89
73	SITOGANA	44J-4B3	8.86	393	26	107	14	45	4.78	0.10	nd	41	10	28	2	4.89	143	1.02	-0.22
74	KUNDAL	44J-4B4	8.21	2466	198	0	525	162	111	0.25	nd	0	218	184	32	22	898	2.67	-11.35
75	CHAK KALA TIBBA	44J-4B6	8.92	6113	66	94	21	115	11	2.75	0.03	12	45	62	8	14	214	1.84	-0.54
76	BAZIPUR BHOMA	44K-1B1	8.65	2616	13	81	14	28	3.6	0.2	0.02	45	2	8.1	3	6.01	122	0.32	-0.69
77	BANNAWALA	44J-2AP1	8.38	5418	66	40	1319	860	113	0.9	nd	49	228	870	40	21	1062	11.62	-18.36
78	MOHREWALA	44J-1CP1	8.90	840	53	215	28	135	14	0.98	nd	16	25	144	7	18	143	5.24	2.42
79	SHAM SINGH WALA		9.25	1207	106	322	43	148	43	0.56	0.04	12	30	245	10	20	153	8.62	5.74
80	MOTIWALA	44J-2BP2	8.97	765	79	121	28	150	0	0.71	0.00	12	32	122	7	18	163	4.15	1.36
81	DIPULANA	44J-3BP2	9.04	1420	66	201	113	252	90	0.38	0.00	8	37	265	27	19	174	8.75	2.03
82	KHUIAN SARWAR	44J-4A1	8.15	1780	0	483	156	342	34	2.70	0.04	12	32	380	27	14	163	12.94	4.66
83	JAIMALWAL	44I4DP1	8.89	856	53	37	64	262	0	0.13	0.04	16	47	106	17	5.73	235	3.01	-2.33
84	LAUKE KALAN	44I-4DP1	8.75	485	26	49	14	160	1.18	0.30	0.04	20	32	40	6	21	184	1.28	-1.99
85	SHAHWALA		8.40	2295	119	631	121	336	21	3.80	nd	12	0	570	5	16	31	44.82	13.69
86	GHAL KHURD		9.10	735	106	188	28	45	25	0.16	0.02	12	40	110	9.2	26	194	3.44	2.72
87	MANSIAN		8.90	470	66	94	14	62	1.87	0.07	nd	12	32	48	6.7	16	163	1.63	0.48
	6. DISTRICT GURDASPUR																		
88	MULLOWALI, M	44M-1AP1	8.45	650	66	242	28	0	0	0.40	0.03	17	18	107	2.8	14	116	4.33	3.85
89	SALE CHAK	43P-4AP1	8.55	1385	66	658	14	65	0.36	0.61	0.09	34	8	285	3.5	18	116	11.53	10.67
90	KALANAUR	43P-4A2	8.20	975	66	403	49	0	41	0.10	0.17	76	28	80	50	25	305	1.99	2.71
91	GHANIYA KI BANGE	44M-1A5A	8.15	1370	0	416	139	46	84	0.32	0.02	34	49	125	80	24	284	3.23	1.15
92	SATHIALI (NANEKO	44J-1BP1	7.00	385	0	175	14	9	39	0.30	0.01	42	20	6	3.8	30	189	0.19	-0.92
93	DOKOHA	44M-2BP1	7.95	475	0	295	14	0	13	0.42	nd	38	28	27	5	27	210	0.81	0.63
94	DERA BABA NANAK	43P-4A1	8.50	1155	66	336	69	78	28	0.19	nd	29	38	120	78	20	231	3.43	3.08
95	DINA NAGAR	43P-4B2	8.50	505	53	134	21	48	1.98	0.27	nd	25	38	28	1.1	22	221	0.82	-0.45
96	GALHRI	43P-4B9	8.05	530	0	309	28	0	0	0.05	nd	46	28	29	1.6	18	231	0.83	0.44

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
97	NAWAN PIND	43P-3C5	8.40	198	26	54	7	10	1.24	0.07	nd	34	5	2	1.2	8	105	0.09	-0.34
98	GHOH	43P-3C6	8.50	545	53	175	28	0	39	0.30	0.21	59	20	35	1	35	231	1.00	0.00
99	PATHANKOT	43P-3C7	8.20	525	0	215	42	21	18	0.10	0.04	55	18	29	1.4	34	210	0.87	-0.68
100	SARMA	43P-3C8	7.75	505	0	215	35	21	22	0.10	nd	72	18	7	1.2	20	252	0.18	-1.52
101	BHOA	43P-3C9	8.15	435	0	148	35	10	40	0.02	nd	42	15	15	11	22	168	0.50	-0.94
102	JHAKOLARI	43P-4C3	8.15	380	0	175	14	12	15	0.02	nd	46	10	9	10	19	158	0.33	-0.29
103	GHAROTA KALAN	43P-4C5	8.40	500	40	242	14	0	0	1.72	nd	25	13	77	1.3	17	120	3.12	2.98
104	KHANI KHUI	43P-4C6	7.70	620	0	403	14	0	18	0.22	nd	55	51	10	0.7	24	347	0.23	-0.33
105	PANDORI TALAB	43P-4C8	8.40	860	66	161	42	58	123	0.14	0.9	84	38	30	24	35	368	0.68	-2.51
106	MADIPUR F. G HURI	44I-1D7	8.35	970	53	242	69	80	12	0.10	0.02	38	20	115	42	23	179	3.74	2.15
107	BHAGOWAL	44M-1A3	8.00	595	0	228	28	52	36	0.29	0.02	63	23	23	7.1	25	252	0.63	-1.30
108	NISHAYARA(DOKW	44M-1B2	8.20	425	0	268	14	0	0	0.14	nd	38	26	18	5.1	18	200	0.55	0.41
109	BHAM	44M-2B1	7.70	490	0	309	14	10	9	0.05	nd	67	23	12	2.9	27	263	0.32	-0.19
110	SRI HARGOBIND PU	44M-2B2	7.85	560	0	255	28	5	50	0.05	nd	59	26	17	4.5	30	252	0.47	-0.86
111	BAMYAL	43P-3B9	8.30	2155	66	416	174	0	225	0.10	nd	34	51	95	305	25	294	2.41	3.14
112	AULAKH KALAN	44M-1C8	7.95	480	0	282	35	0	10	0.07	nd	55	23	15	3.1	19	252	0.43	0.00
113	DHIANPUR	44M-1A1	8.00	515	0	242	14	55	0	0.00	nd	55	18	29	3.9	28	210	0.87	-0.24
114	SAIDOWAL KALAN		8.65	1035	66	175	90	50	36	0.29	nd	25	31	50	130	19	189	1.58	1.28
115	MEHTA	44M-2A2	8.32	450	26	255	14	0	0.26	0.47	nd	34	15	45	7.7	24	168	1.61	2.12
	7. DISTRICT HOSHIARPUR																		
116	SHAM CHAURASI	44M-2C9	7.23	757	0	429	20	32	0	0.48	0	70	27	60	5.7	14	285	1.54	1.32
117	PHUGLANA	44M-3DP1	7.63	906	0	381	25	18	147	0.48	0.01	74	33	76	1.3	19	322	1.85	-0.16
118	THAKKAR WALA	44M-3D5	7.79	518	0	338	3.5	1.6	2.9	0.35	0.00	30	31	38	4	23	201	1.16	1.49
119	MAHILPUR	53A-3DP1	7.82	447	0	223	19	14	2	0.05	0.00	34	17	35	2.2	12	153	1.22	0.56
120	RAMPUR COLONY	44M-2DP1	7.70	910	0	362	71	52	21	0.35	0.01	42	31	112	1.7	19	232	3.20	1.29
121	ADOWAL GARHI	44M-1CP3	8.03	290	0	169	5.3	0.8	7.3	0.22	0.08	38	6.4	15	1.3	22	122	0.59	0.35
122	GARHDIWALA	44M-1CP2	7.84	356	0	206	11	1.6	0	0.28	0.00	36	14	17	1.5	22	148	0.61	0.43
123	DASSUYA, D	44M-1CP1	7.56	570	0	296	18	14	22	0.14	0.02	66	23	22	2.5	23	259	0.59	-0.33
124	DURMIWAL	44M-1D4	8.03	593	0	356	8.9	3.2	10	0.06	0.15	78	22	12	5.7	26	285	0.31	0.13
125	MUKERIAN	44M-1C3	7.22	419	0	212	21	10	13	0.22	0.02	55	10	21	1.5	13	180	0.68	-0.09
126	NANAGAL BIHALA	44M-1C4	7.62	458	0	272	11	5.2	6.5	0.14	0.00	42	17	36	2	27	174	1.18	0.96
127	HAZIPUR	44M-1C2	7.37	656	0	266	34	13	80	0.22	0.00	76	28	19	1.2	22	306	0.47	-1.74
128	TALWARA	44M-1D1	7.88	347	0	200	7.1	0	11	0.28	0.00	49	7.7	14	1	25	153	0.49	0.20
129	BHAMNAUR	44M-1D2	8.04	492	0	175	28	17	64	0.22	0.07	57	13	28	0.9	35	195	0.87	-1.05
130	CHOHAL	44M-2D5	7.36	1268	0	495	57	59	21	0.28	nd	93	35	120	14	18	375	2.69	0.59

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
131	GARHSHANKAR	53A-4AP1	7.24	713	0	326	53	20	20	0.28	nd	21	49	56	7.6	26	253	1.53	0.27
132	SIMBLI		8.23	854	0	435	60	20	6.5	0.43	nd	21	55	86	5.8	30	280	2.24	1.56
	8. DISTRICT JALANDHAR																		
133	SHAHKOT, S	44M-4BP1	7.95	811	0	375	57	22	33	0.28	0.00	42	36	84	5.7	28	253	2.30	1.09
134	NAKODAR, D	44M-4BP2	8.25	565	0	212	46	16	46	0.28	nd	17	37	45	5.2	27	195	1.40	-0.42
135	SARIH	53D-4D2	8.68	647	47	254	8.9	35	1.9	3.1	0.00	11	9	130	3.2	17	64	7.04	4.44
136	PHILLAUR, S	44M-4DP1	8.79	1240	59	525	64	53	16	0.72	0.00	11	67	176	6.6	23	301	4.40	4.51
137	GORAYA, D	44M-4DP3	8.22	457	0	236	8.9	31	1.8	1.09	0.00	40	28	10	4.8	20	217	0.30	-0.43
138	JANDIALA GURU	44M-4C1A	7.77	1288	0	544	74	72	61	0.44	0.00	32	41	195	18	24	248	5.38	3.95
139	UDHOPUR	44M-4C11	7.97	542	0	260	32	13	13	0.44	0.00	32	19	57	4.9	22	159	1.97	1.10
140	LALIAN	44M-3BP3	7.42	817	0	381	25	88	0.08	0.44	0.00	70	37	53	6.3	29	327	1.28	-0.29
141	JALANDHAR, D	44M-3CP1	7.78	678	0	338	28	30	11	0.28	0.00	34	26	78	5	26	190	2.45	1.70
142	KARTARPUR, S	44M-3BP1	7.02	1180	0	212	252	76	0.5	0.44	0.00	95	41	90	7.1	27	406	1.94	-4.64
143	KHARAL KALAN	44M-2CP2	7.72	721	0	369	12	65	0	0.43	0.00	30	22	105	5.5	23	164	3.55	2.74
144	ALLWALPUR	44M-3C9	7.45	763	0	447	34	7.2	1.4	0.69	0.01	38	26	105	1.5	21	201	3.22	3.29
145	ADAMPUR, M	44M-3CP29	7.49	971	0	453	39	30	57	0.35	0.00	53	18	142	1.6	17	206	4.30	3.30
146	JALBHE	44M-3D8	8.09	608	0	314	32	18	0.41	0.43	0.00	19	19	86	7.6	14	127	3.34	2.64
	9. DISTRICT KAPURTHALA																		
147	DALLA	44M-4A4	8.50	495	53	201	28	0	9.98	0.35	nd	34	28	45	4.5	24	200	1.39	1.07
148	PHAGWARA	44M-4D6	8.70	495	53	201	14	0	4.63	0.40	nd	17	26	59	5.7	25	147	2.12	2.12
149	BHOLATH	44M-2CP1	8.25	680	0	148	83	89	0.08	0.34	nd	51	18	59	6	24	200	1.82	-1.57
150	BHATNURA KHURD	44M-2CP3	8.10	702	0	403	21	33	0	0.19	nd	42	28	76	8.4	28	221	2.23	2.19
151	KAPURTHALA	44M-3BP2	8.80	733	0	510	21	0	0	0.07	nd	42	31	95	5.4	27	235	2.72	3.74
152	TALWANDI-CHAUNDRIAN	44M-2AP2	8.45	405	53	175	7	172	0	0.17	0.03	13	56	74	1.9	19	263	1.99	-0.63
153	SULTANPUR LODHI	44M-4AP1	8.45	570	40	295	21	0	10	0.29	0.25	80	15	34	8.6	21	263	0.91	0.91
	10. DISTRICT LUDHIANA																		
154	IKLOHA	53B-2A1	8.26	552	0	223	34	29	28	0.53	0.02	27	33	28	20	23	206	0.85	-0.41
155	KADDON	53B-1A2	8.29	684	0	344	25	29	26	0.41	0.0	19	28	93	6.5	22	164	3.17	2.39
156	PAYAL		8.07	640	0	266	53	14	27	0.41	0.00	36	39	36	8	24	248	0.99	-0.64
157	MAKSUDRA	44N-1D5	7.61	1608	0	580	96	100	137	0.53	0.01	93	69	82	110	25	517	1.57	-0.81
158	DORAHA	53B-1BP2	8.13	548	0	175	32	61	37	0.41	0.00	45	27	27	4.5	19	222	0.79	-1.60
159	BEGOWAL	53B-1A14	8.40	1312	12	635	50	54	52	1.08	0.00	8.4	53	220	8.4	22	238	6.19	6.03
160	LALAN	53B-1A1	8.70	3100	30	350	532	284	275	0.83	0.00	11	182	375	40	17	776	5.86	-8.78
161	SAMRALA	53B-1AP1	8.46	672	12	260	28	31	59	0.41	0.00	26	42	45	16	24	238	1.27	-0.09

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
162	UTLANA	53B-1A4A	8.35	504	6	254	23	15	1.3	0.06	0.00	11	44	26	8.6	14	206	0.78	0.20
163	MUSKABAD	53B-1A11	8.00	1248	0	398	191	49	7.8	0.36	0.01	66	71	85	19	29	454	1.73	-2.61
164	BHALOLPUR	53B-1B4	8.11	488	0	200	12	36	45	0.12	0.0	47	26	14	4.4	30	222	0.41	-1.21
165	SHERIAN	53B-1A13	8.20	1033	0	411	18	150	36	0.48	0.00	27	48	130	9.9	10	264	3.48	1.44
166	PUNJETA	53B-1A8	8.24	384	0	175	12	10	27	0.15	0.00	23	26	12	5.3	24	164	0.41	-0.42
167	INDIRA PARK		7.78	796	0	272	110	11	17	0.28	0.00	66	39	37	7.8	26	322	0.89	-2.04
168	DAIRY MILK		7.51	1308	0	393	167	77	46	0.2	0.02	70	41	155	8.8	27	343	3.64	-0.42
169	PAU, LUDHIANA	44N-1DP1	7.86	616	0	284	11	33	50	0.28	0.00	57	31	23	5.7	19	269	0.61	-0.74
170	GOPALPUR	44N-2DP1	8.90	1401	77	459	103	54	36	0.55	0.00	13	45	245	9.4	26	217	7.23	5.74
171	LEEL	44N-2CP1	8.30	388	6	187	7.1	27	2.9	0.48	0.02	30	22	19	4.4	23	164	0.64	-0.04
172	JAGRAON	44N-1BP1	7.96	620	0	344	14	8.4	28	0.55	0.00	32	27	64	6.2	24	190	2.02	1.82
173	SIDHWAN BET	44N-1B4	8.27	392	0	187	11	24	12	0.28	0.00	23	19	28	5.8	23	137	1.05	0.35
	11. DISTRICT MANSA																		
174	Budhlada	44O-1C1	8.54	699	46	247	61	24	16	0.28	nd	12	57	62	10	7.5	262	1.67	0.35
175	Biroke	44O1C3	9	2883	177	408	271	300	280	1.83	nd	14	20	662	5.0	8.41	116	26.69	10.26
176	Mofar	44O-1BP1	8.76	805	46	207	61	50	24	1.09	nd	17	12	139	5.3	10	92	6.30	3.08
177	Fatta Maluka	44O-1B6	8.72	4890	191	448	644	1000	61	1.3	nd	21	79	1092	10	18	379	24.42	6.12
178	Raipur		9.04	3848	197	354	546	400	293	1.5	nd	12	61	780	100	8.9	282	20.23	6.75
179	Burj Bhalaike	44O-1B5	8.95	2831	118	367	481	255	21	0.73	nd	5.8	61	445	191	10	267	11.85	4.63
180	Kot Shamir	44N-4A1	9.02	1394	105	361	152	5.3	24	7.46	nd	19	19	270	14	10	126	10.46	6.90
181	Ralla	44N-4B2	8.69	1018	53	200	29	170	62	1.7	nd	14	50	61	118	9.1	238	1.72	0.28
182	Bhikhi	44N-4CP1	9.14	1595	250	307	58	70	18	3.89	nd	14	5.9	362	4.5	9.6	58	20.64	12.20
183	Kotra	44N-4B6	8.92	1979	125	688	181	88	28	3.59	nd	7.8	42	399	72	7.6	194	12.46	11.56
184	Jhunir	44O1B2	8.72	979	59	434	29	50	2.9	1.56	nd	12	14	204	17	9.8	87	9.50	7.34
185	Narenderpura	44O1C4	8.74	1218	85	334	83	22	88	1.61	nd	17	59	161	7.0	8.3	286	4.14	2.60
186	Borawal	44O1C2	9.2	1679	151	287	152	155	69	1.16	nd	16	25	357	5.0	16	141	13.09	6.93
	12. DISTRICT MOGA																		
187	CHAUGAMAN	44N-1BP3	9.20	915	79	322	50	62	22	0.81	nd	8	27	190	7	11	133	7.18	5.27
188	DAGRU	44N-1AP1	9.12	720	40	295	28	50	6.13	0.61	0.03	12	7	160	3	15	61	8.90	4.94
189	BUDH.S.WALA	44N-2AP2	9.00	815	40	295	71	25	16	0.27	0.02	12	25	145	6.5	20	133	5.48	3.51
190	NIHAL SINGH	44N-2AP1	9.20	850	92	309	50	15	22	0.27	0.03	20	37	140	8	22	204	4.26	4.06
191	BAJEKE	44N-1AP2	8.85	465	40	81	11	102	0	0.16	nd	20	32	31	6.7	26	184	1.00	-1.03
192	DAMERU KHURD	44J-2D4							Leaked										
193	DARAPUR	44J-1DP1	9.10	880	92	188	35	118	0	0.70	nd	8	7	200	2.5	16	51	12.18	5.14
	13. DISTRICT MUKTSAR																		

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
194	BILOCH KHERA	44J-4B10	9.00	1440	92	295	227	0	130	1.40	0.03	16	74	200	34	22	347	4.67	0.98
195	LABIANWALI	44J-2C2	7.90	1620	0	322	135	325	108	0.32	nd	57	55	235	13	18	367	5.33	-2.06
196	MUKTSAR	44J-3C1	8.55	326	26	94	14	25	1.62	0.45	0.04	29	15	16	4	9.02	133	0.60	-0.23
197	BHALIANA		8.89	5019	53	188	620	998	675	0.58	0.03	10	154	720	390	20	658	12.21	-8.32
198	DODA	44J-3C9	8.05	5712	0	550	1049	1172	171	0.72	0.02	245	146	920	70	25	1215	11.49	-15.26
199	KUTTIANWALI	44J-4B8	8.73	5525	53	121	525	1835	344	2.70	0.01	65	151	940	240	22	786	14.59	-11.97
200	QABARWALA	44J-4B9	9.10	2298	92	295	227	372	112	4.90	0.03	29	22	470	24	19	163	16.00	4.66
201	KHUNDE HALAL	44J-3BP1	9.25	2780	119	416	340	402	85	1.25	0.04	4	253	130	145	21	1051	1.74	-10.23
	14. DISTRICT NAWANSHAHR																		
202	MEHADPUR	53A-4AP2	7.71	521	0	278	11	9.2	33	0.28	nd	15	37	43	2.1	19	190	1.36	0.76
203	RAIPUR DABBA	53A-4BP4	7.80	670	0	308	60	3.2	6	0.43	nd	51	36	30	6.5	26	275	0.79	-0.46
204	BAHLOR KALAN	53A-4AP3	7.53	724	0	435	8.9	31	0.03	0.28	nd	38	42	60	11	12	269	1.60	1.78
205	RAHON	53A-4A3	7.27	565	0	314	5.3	22	14	0.5	nd	55	26	25	4.4	21	243	0.70	0.26
206	BALACHOUR	53A-4BP2	7.64	519	0	278	12	5.6	20	0.35	nd	57	23	15	3.6	17	238	0.42	-0.18
207	MAUHAR	53A-4BP3	8.22	453	0	266	7.1	4.8	16	0.22	nd	40	22	26	2.9	25	190	0.82	0.55
	15. DISTRICT PATIALA																		
208	Tuha	53B-2CP3	8.75	1222	59	334	181	5.3	5.7	0.52	nd	12	68	148	3.5	14	311	3.65	1.24
209	Rajpura	53B-3CP4	9.12	1833	151	508	87	200	28	0.98	nd	7.8	40	386	6.0	17	184	12.37	9.67
210	Bir Kauli	53B-3CP1	8.6	998	20	207	101	145	2.7	0.68	nd	16	54	108	6.5	15	262	2.90	-1.19
211	Dhak Raba	53B-3BP3	8.5	258	6.6	107	7	19	0	0.6	nd	23	13	6.7	3	20	112	0.28	-0.26
212	Samana	53B-4A2A	8.5	905	26	281	101	12	29	0.4	nd	21	27	113	33	19	165	3.83	2.18
213	Patran	53B-1AP2	8.81	579	39	214	22	0	9.2	0.71	nd	14	22	72	5.5	20	126	2.79	2.30
214	Bhojomajra	53B-3AP2	8.42	329	13	134	11	24	1.6	0.59	nd	31	19	6.7	3.3	20	155	0.23	-0.48
215	Devigarh	53B-3BP5	8.81	875	46	327	40	90	0	0.66	nd	7.8	33	157	3.5	13	155	5.48	3.79
216	Massingana		8.86	1242	66	347	94	145	12	0.79	nd	19	32	236	4.5	18	180	7.66	4.30
217	Hari Majra	53B-3C12	8.67	2387	39	347	195	600	3	0.74	nd	19	66	429	6.0	7.4	320	10.43	0.61
218	Lachkani	53B-3C11	8.81	924	46	274	98	25	23	0.41	nd	12	35	135	20	15	175	4.44	2.53
219	Kami kalan	53B-3CP2	8.77	707	33	294	22	25	0	0.5	nd	17	24	95	5.3	14	141	3.48	3.10
220	Bassama	53B-3C9	8.63	2236	46	301	470	145	14	0.37	nd	19	98	225	158	9.3	451	4.61	-2.56
221	Kalyan	53B-3BP4	8.78	758	33	274	58	0	20	0.49	nd	14	35	87	11	21	180	2.82	2.00
222	Miranpur	53B-4BP4	8.67	1235	39	241	159	130	0	0.93	nd	23	40	181	5.5	11	223	5.27	0.79
223	Bagrain	53B-3AP4	8.66	497	20	261	14	0	1	0.43	nd	16	24	58	5.1	22	136	2.16	2.21
224	Sangatpura	53B-3AP3	8.75	656	39	234	18	25	22	0.24	nd	27	14	82	20	19	126	3.18	2.62
225	Chittowal	53B-3AP1	8.91	1325	72	414	51	100	16	0.3	nd	16	19	251	7.0	23	116	10.12	6.87
226	Lachru	53B-3C11	8.95	2750	85	548	336	310	28	0.89	nd	7.8	55	518	6.0	12	248	14.33	6.88

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
	16. DISTRICT ROPAR																		
227	SOARA	53B2-2C5	8.5	1758	71	442	197	165	19	0.41	0.41	24	57	249	89	28	294	6.31	3.73
228	LANDRAN	53B2-2C4	7.49	1263	0	646	63	48	7.9	0.58	0.04	51	33	149	70	20	265	4.00	5.33
229	GOGA	53B-2C6	7.86	640	0	359	21	22	22	0.4	0.00	39	21	82	0.5	18	186	2.63	2.21
230	ROORKEE HEERAN	53B-1B6	7.59	680	0	335	35	30	20	0.19	nd	67	36	22	8.5	24	314	0.54	-0.81
231	BARA CHAUNTA	53B1-1C1	7.94	578	0	347	28	11	3.2	0.3	0.03	43	26	53	7.9	23	216	1.58	1.40
232	DUMEWAL	53A-4B5	7.19	660	0	251	42	38	59	0.08	nd	71	36	13	1.4	22	324	0.31	-2.39
233	BHALAN	53A-3B4	7.64	1072	0	430	70	90	32	0.25	nd	59	71	57	4	19	441	1.18	-1.74
234	BRAHMPUR	53A-3B2	8.34	420	18	149	14	46	7.4	0.34	nd	55	19	5.8	0.3	16	216	0.17	-1.27
235	DHAIR	53A-3B1	7.89	835	0	263	91	100	5.5	0.14	nd	63	33	73	1.9	19	294	1.86	-1.55
236	HARDONAMOH	53A-4C5	7.61	598	0	299	21	68	1.5	0.29	nd	51	36	26	13	20	275	0.68	-0.61
237	AHMEDPUR	53A-4C3A	7.66	965	0	359	112	56	0.03	0.15	nd	35	57	85	2.7	14	323	2.06	-0.55
238	CHANNALON	53B1-C3	7.39	1510	0	251	246	140	117	0.12	nd	63	114	73	5.5	22	627	1.27	-8.41
239	CHATAMALI	53B-1CP1	7.94	840	0	502	14	26	17	0.83	0.015	43	31	109	2.8	21	235	3.09	3.53
240	KAKRALI	53B1-C11	7.86	690	0	383	49	1	0.18	0.44	nd	39	52	30	5.8	25	314	0.74	0.05
241	ROPAR	53B1-1B9	7.74	580	0	179	56	95	0	0.58	nd	71	21	27	3.1	19	265	0.72	-2.34
242	CHAKDERA	53A-4C7	7.61	505	0	287	14	9	0	1.1	nd	55	17	24	6.3	17	206	0.73	0.56
	17. DISTRICT SANGRUR																		
243	MALER KOTLA	44N-2D5	8.9	1070	92	334	72	19	62	0.65	nd	16	25	211	8.0	23	141	7.74	5.73
244	BHOJOWALI	44N-3D9	9.23	1764	210	641	36	25	0.3	0.73	nd	12	19	387	5.5	15	107	16.30	15.39
245	BUGRA	44N-3DP2	8.62	682	46	254	36	10	0	0.17	nd	10	65	27	6.6	23	291	0.69	-0.13
246	LONGOWAL	53B-CP3	9.06	1215	105	401	65	120	8.1	0.51	nd	10	35	254	6.5	19	170	8.48	6.68
247	SUNAM	44N-4DP1	8.85	1067	85	388	11	95	57	0.21	nd	3.9	33	217	7.0	24	146	7.83	6.29
248	CHURAL KALAN	44O-1DP3	9.07	1421	125	595	33	0	22	0.38	nd	17	35	260	5.0	22	189	8.22	10.12
249	Sangrur		8.54	609	26	234	54	15	17	0.59	nd	7.8	39	75	4.3	17	180	2.44	1.12
250	Bhulan	53C1A3	8.26	4594	0	281	871	658	467	0.65	nd	35	238	640	58	16	1068	8.52	-16.74
251	Leharagaga		9.03	3051	158	461	358	600	19	2.52	nd	14	55	715	9.0	16	262	19.22	7.57
252	Haryao	44O1D10	9.12	1584	125	621	105	10	6.8	1.97	nd	12	25	341	6.5	19	131	12.96	11.73
253	Ladda	44N-3DP4	8.8	844	66	294	40	3.8	75	0.3	nd	19	35	123	10	23	194	3.84	3.13
254	Mehrampur	44N-3DP3	8.57	485	26	160	47	12	0.4	0.38	nd	21	29	35	5.2	21	175	1.15	0.01
255	Badrukha	44N-3DP1	8.92	1113	131	254	58	70	56	0.76	nd	12	31	216	7.0	20	155	7.54	5.44
	18 DISTRICT SAS NAGAR																		
256	Nariana	53B-2C12	8.19	1230	0	681	35	68	6.5	1.23	nd	39	33	206	4.8	19	235	5.87	6.50
257	HALUKA	53B2-2C14	7.88	1100	0	598	63	44	0.03	1.27	nd	35	45	161	2.6	19	274	4.24	4.35
258	DHERI, DW	53B-2C7	7.71	785	0	311	56	95	30	0.55	nd	60	33	83	0.9	20	265	2.14	-0.61

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	(----------mg/l----------)														meq/l
259	Derabassi	53B2D6	7.63	2560	0	466	414	145	256	0.42	nd	137	119	225	5.1	21	833	3.39	-8.99
260	CHHATT	53B-2DP2	7.42	1320	0	658	77	72	20	0.29	nd	67	48	171	4.8	25	363	3.90	3.49
261	HANDESARA	53B-3CP3	7.2	1177	0	622	49	58	0.36	0.64	0.043	94	31	123	9.6	20	363	2.81	2.95
262	ANTALA	53B-3D5	8.08	1989	0	825	98	210	84	0.32	2.59	133	50	213	85	25	539	4.00	2.77
263	Mirpur	53B-4BP4	7.74	651	0	395	28	0	2.5	0.78	nd	43	7.1	101	0.9	20	137	3.76	3.74
264	BANUR	53B-2C2	7.65	1088	0	227	105	85	136	0.18	0.011	86	45	59	3.2	24	402	1.28	-4.27
265	JOLLY	53B-2D9	7.49	1079	0	395	84	105	45	0.42	nd	55	43	127	3.6	18	314	3.12	0.19
266	Sirsini	53B-3D7	7.78	3422	0	849	435	600	7.1	2.07	nd	71	219	399	4.5	22	1078	5.29	-7.64
	19 DISTRICT: TARANTARAN																		
267	AMNISHA KALRA	44I-3C5	7.88	1165	0	564	56	75	0.63	0.36	0.02	25	36	185	7.5	24	210	5.55	5.04
268	CHABAL	44I-3D6	8.40	440	26	228	10	5	0	0.07	0.01	13	18	65	5.4	25	105	2.76	2.52
269	GOINDWAL	44M-3A6	8.15	488	0	349	10	0	0	0.17	0.02	29	18	70	4.2	23	147	2.51	2.78
270	KALSIA KALAN	44I-3C6	8.20	1040	0	510	28	69	0.36	0.12	0.02	13	15	195	10	18	95	8.73	6.47
271	GANDIWIND	44I-2CP2	8.55	755	79	295	35	0	10	0.95	nd	17	36	108	10	15	189	3.42	3.70
272	BHIKIWIND	44I-3CP1	8.10	1480	0	792	49	46	27	1.85	0.05	38	26	270	6.5	30	200	8.31	8.99
273	RATTOKE	44I-4C4	7.95	1775	0	698	160	78	13	0.74	nd	25	23	335	6.5	23	158	11.61	8.29
274	CHOLA SAHIB	44I-3D4	7.55	915	0	443	35	35	55	0.40	0.01	42	36	108	6.8	26	252	2.96	2.22
275	SAHABPURA	44I-3DP2	7.95	930	0	582	21	0	0	0.95	nd	17	15	185	5.8	25	105	7.85	7.45
276	KHANDUR	44M-3A2	8.45	845	26	483	14	0	13	0.80	nd	29	26	130	10	14	179	4.23	5.23

Results of chemical analysis of water samples from NHS in Chandigarh, UT(2014)

SR	LOCATION	WELL NO.	pH	EC in	CO_3	HCO_3	Cl	SO_4	NO_3	F	PO_4	Ca	Mg	Na	K	SiO_2	T.H	SAR	RSC
				µS/cm												as $CaCO_3$			in
				at 25^0C	----------mg/l----------														meq/l
1	Sector-44		7.44	650	0	335	35	23	2.9	0.52	nd	39	36	48	0.9	15	245	1.33	0.58
2	Burail		8.15	1188	0	589	70	44	22	0.17	0.083	43	71	45	113	28	402	0.98	1.67