IN THE NATIONAL GREEN TRIBUNAL, NEW DELHI

Status Report

In compliance of order dated 30.04.2024

in

Original Application No. 632 of 2022

V. K. Tyagi — Applicant

Versus

State of Uttarakhand & Ors. — Respondents

Dated: August 6, 2024

Filed by:

Dr. Parag Madhukar Dhakate
Member Secretary
Uttarakhand Pollution Control Board,
Dehradun

Status Report

In the matter of Original Application No. 632 of 2022
titled as
"V. K. Tyagi Versus State of Uttarakhand & Ors."

1. That the matter of encroachment on the land of river Solani, Roorkee, District Haridwar (Uttarakhand) for cultivation purposes and disposal of untreated sewage drains in to river Solani, is under consideration before the Hon'ble National Green Tribunal, New Delhi. Disposal of untreated sewage through drains in river Solani is also causing detrimental effect on aquatic life.

2. That the river Solani is non-perennial river originating from Shivalik foothills and runs along the Biharigarh, Bhagwanpur, Roorkee, Laksar towns of the State of Uttarakhand before its confluence with river Banganga at upstream of Shukratal, Uttar Pradesh. The length of Solani River is 71 km with an average slope of 2.84 m/ km in the State of Uttarakhand. The maximum river width (~402.2 m) is found near downstream area while the minimum width (~110 m) is at 1 km at Biharigarh. The Solani River is flowing over relatively flat land with significant meandering channel. The river width is also confined with bunds at various places and also it under passed by upper ganga canal. In Roorkee town, the minimum channel width is ~80 m and the maximum width is ~410 m with a mean channel width of ~248m.

3. That the river Solani as such do not receives industrial wastewater from industries located in nearby areas, however, seven municipal drains from Roorkee town and STP outlet at Saliyar find their way in to river Solani. At the downstream od Roorkee, Ratmau river joins the river Solani, and thereafter significant increases in water flow observed.

4. That the Hon'ble National Green Tribunal vide order dated 30.04.2024 was pleased to inter alia issued following directions:

"……

16. In the peculiar facts and circumstances we consider it essential to constitute and accordingly constitute a Committee comprising nominees of Regional Officer, Integrated Regional Office, MOEF&CC, Dehradun; Secretary, Irrigation Department, Uttarakhand, and Principal Secretary, Irrigation and Water Resources Department, Uttar Pradesh, Member Secretaries, UKPCB and UPPCB, Engineer-in-Chief, Irrigation Department, Uttarakhand and Engineer-in-Chief, Irrigation and Water Resources Department, Uttar Pradesh, Director, National Institute of Hydrology, Roorkee, Mr. Raman Kant, President, Bhartiya Nadi Parishad, First Floor, Samrat Shopping Mall, Garh Road, Meerut, Uttar Pradesh (Non-Official) and Mr. Vineet Kashyap, Development Researcher, First Floor, A-154, Kalkaji, New Delhi (Non-Official) The Non-Official Members of the Committee will be paid honorarium of Rs. 50,000/- (one time) besides travelling and boarding/lodging expenses. The expenses of the Committee for convening meetings, travelling, boarding/lodging etc., will be borne by the UKPCB and UPPCB in equal proportions out of environmental compensation amount lying deposited with them. UKPCB will be the nodal agency for co-ordination and compliance.

……"

5. That the Hon'ble Tribunal has mandated the Committee with following mandates:

i) Identification /demarcation of area of Sonali River and its translation on GIS Map.

ii) Rehabilitation and management of its catchment area.

iii) Encroachments on the same and removal thereof.

iv) Tapping of all drains discharging in river Sonali by construction of STPs etc.

v) Review of existing treatment facilities for treatment of industrial effluents and domestic sewage and improvements required to be made; and

vi) Reuse of treated water from STPs/CETPs for irrigation by connecting the same to irrigation canals/channels and industrial purposes by laying down pipelines connecting the concerned industries.

6. That in order to fulfil the mandate of the Committee, inspection of the Solani river catchment were conducted jointly by Shri Raman Kant, President, Bhartiya Nadi Parishad, Meerut and UKPCB officials. The report prepared by Shri Raman Kant is being filed and marked as **Annexure No. 1** with this status report.

7. That the flood plain zoning of river Solani-Ratmau in accordance of the Uttarakhand Flood Plain Zoning Act, 2012 is being carried out by the Hydraulic Division, Irrigation Research Institute (IRI), Department of Irrigation, Uttarakhand. During the review meeting the officials of Uttarakhand Irrigation Department informed that for Flood Plain Zoning of river Solani, hydrological study with estimation of catchment area of river Solani has been completed and ground truthing is being done, which is expected to be completed by August, 2024. GIS map with demarcation of river Solani is now available and will be shared in KML format. In continuation of review meeting, Irrigation Department has forwarded the flood plain zoning report along with HFL points and GIS Map of river Solani-Ratmau. Copy of flood plain zoning report along with HFL points and GIS Map of river Solani-Ratmau is being filed and marked as **Annexure No. 2** with this status report.

8. That the Executive Engineer, North Division Ganga Canal, UP Irrigation Department, Roorkee has informed that there was no permanent encroachment in river Solani. Lease granted earlier for cultivation purposes have been cancelled and encroachment has been removed from river Solani. Copy of letter dated 02.08.2024 is being filed and marked as **Annexure No. 3** with this status report.

9. That the Uttarakhand Peyjal Nigam has identified the drains joining the river Solani along with location for Interception and

Diversion (I&Ds) of drains and Sewage Pumping Station (SPS) leading to STP, however, in absence of demarcation of HFL of the area, land could not be granted by the UP Irrigation Department. Now, HFL data of river Solani is available with Uttarakhand Irrigation Department, the land issue would be shorted out at the earliest. Thereafter, the executing agency will finalize the proposal for Interception & Diversion of drains, establishment of SPS, Sewerage network, rising mains etc. In this regard copy of letter dated 27.07.2024 of Uttar Pradesh Irrigation Department is being filed and marked as **Annexure No. 4** with this status report.

10. That the industries located in the catchment of river Solani do not discharge wastewater in to river Solani, therefore, there is no requirement of CETP. However, regular surveillance will be carried out by the UKPCB ensuring that no wastewater is discharge in to river, illegally.

11. That the water quality characteristic of river Solani at upstream of Kuankhera village is being carried out by the UKPCB on monthly basis. Water quality analysis data categorised the river Solani under Class "B" category as per CPCB classification of Water quality Criteria. In this regard, water quality analysis data from January 2023 to June, 2024 is being filed and marked as **Annexure No. 5** with this status report.

12. That the performance monitoring of STP located at Saliyar is being monitored by UKPCB on monthly basis. The inlet to STP and Outlet discharge characteristics from January, 2023 to June, 2024 is being is being filed and marked as **Annexure No. 6** with this status report.

13. That it is evident from above that substantial data has been generated by the concern departments in order to fulfil the mandate of the Committee entrusted by the Hon'ble Tribunal. However, generated data and reports needs to be placed in report form. During the review meeting, Dr. Rao, Scientist 'G', of the National Institute of Hydrology (NIH) has accepted the task of

data compilation and report writing. All the required information will be made available to NIH by the concerned departments. Administrative expansive in this regard will be borne by UKPCB. Copy of minutes of meeting held on 26.07.2024 is being filed and marked as **Annexure No. 7** with this status report.

PRAYER:

14. That in view of above and considering the involvement of various departments and stakeholders, one month time is required for compilation of data and finalization of report of the Committee. Therefore, most respectfully prayed to the Hon'ble Tribunal may like to consider graciously upon request for time extension.

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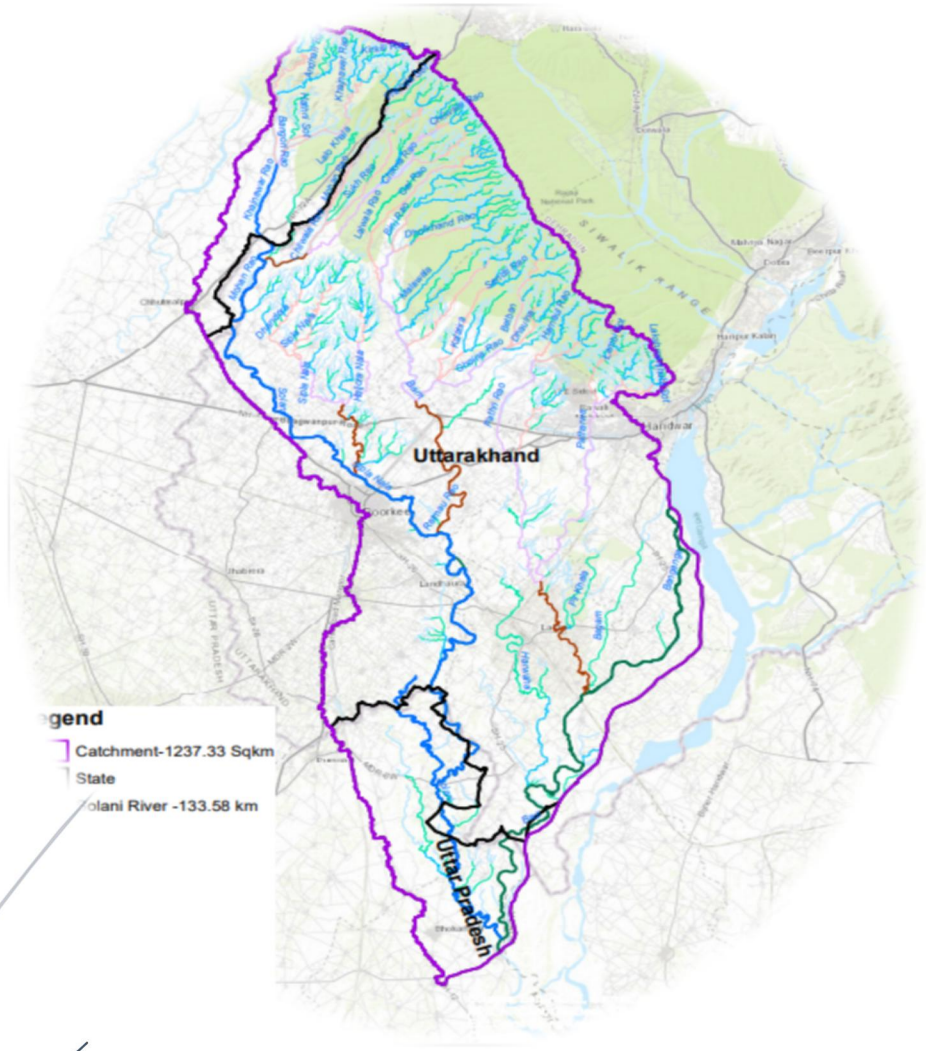
Annexure No. 1

SOLANI RIVER

Rejuvenation Measures



Raman Kant
Riverman of India
President – Bhartiya Nadi Parishad
+91 9411 676951

भारतीय नदी परिषद

Solani River Survey

In the application number 632/2022 regarding Solani river filed by Shri VK Tyagi in the main bench of Hon'ble NGT, I (Raman Kant, President of Bhartiya Nadi Parishad) was included in the committee constituted by the division bench of Hon'ble Judge Shri Arun Kumar Tyagi and Hon'ble Expert Member Dr. Afroz Ahmed on 30th April, 2024.

In compliance with the instructions of Hon'ble NGT, on 18th and 19th June, I along with the team of Uttarakhand Pollution Control Board inspected the river from the origin of Solani river in Saharanpur to Haridwar district. During this, I saw all the major places of the river and all its aspects. During this, officials of Forest Department, Shivalik and Uttarakhand Jal Jal Sansthan were also present. On June 26, 2024, I, along with the team of Pollution Control Board, Muzaffarnagar, inspected the Solani river from its merger with Banganga at Sukhtirth to its merger with Ganga at Haiderpur Wetland.

In these three days, after talking to all the stakeholders related to the river and conducting a field inspection, I thoroughly examined the current problems of the river and prepared a framework for solution based on my experiences of river rejuvenation in the last 22 years.

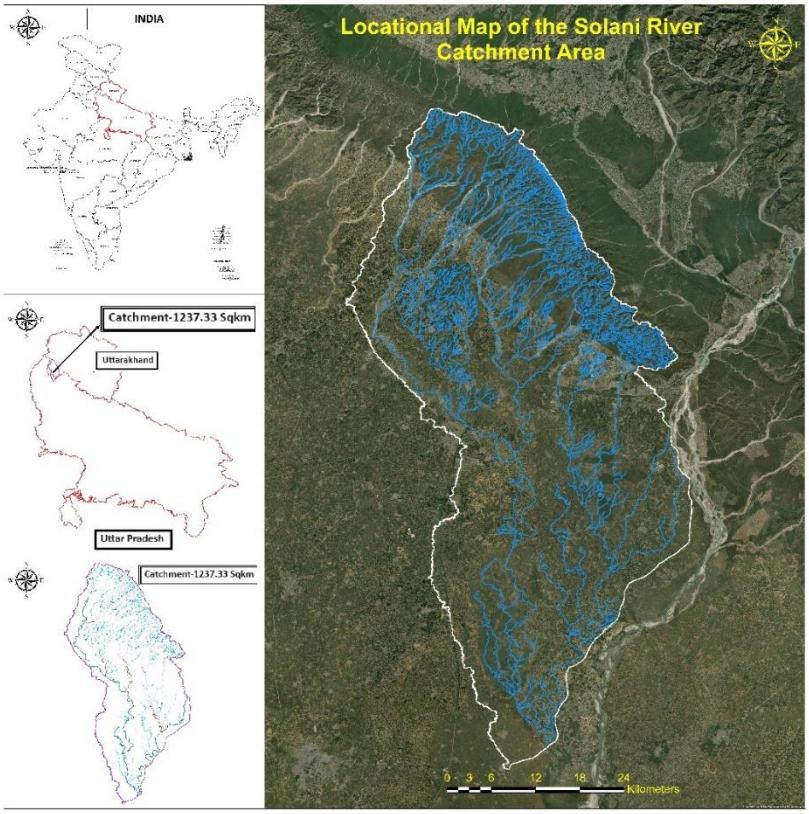
Contents

Introduction

The Solani River, a vital waterway in the northern Indian states of Uttarakhand and Uttar Pradesh, has long served as a crucial source of water for agriculture, drinking, and various domestic purposes for the communities living along its banks.

The Solani River originates from Saharanpur district in Uttar Pradesh and flows through Roorkee city in Haridwar district of Uttarakhand, then re-enters Muzaffarnagar district, Uttar Pradesh, reaching the historical and religious city of Sukhtirth, where it merges with Banganga. After originating, the Solani River covers a distance of approximately 145 kilometers passing through towns like Biharigarh, Bhagwanpur, Roorkee, and Laksar. It is a rain-fed river, almost dry during winter but prone to flooding during the monsoon, causing significant damage to low-lying areas along its banks. The Solani River has made its basin fertile for agriculture.

The Solani River originates in the Shivalik hills of Saharanpur district, formed by the confluence of two main streams, Khajnawar and Shahjahanpur, along with several smaller streams from these hills. Khajnawar and Shahjahanpur streams flow through the Shivalik forest about ten kilometers from the slopes of the Shivalik hills. After leaving the forest boundary, these streams converge approximately 10 kilometers downstream on the road from Dehradun to Sakumbhari near Saliyar Salahpur village. Before becoming the Solani River, it is joined by several other smaller streams. The Solani River flows gently, growing in size and importance. On the banks of the river in Saliyar Salahpur, there is a functioning stone crusher, while on the opposite side, a builder is constructing a colony on land adjacent to the river.



According to the British Gazetteer, the name Solani River is first given to the stream formed by the confluence of Chilawala, Kania, Sukh, and Mohand Rao, which drains the sub-mountainous region up to the edge of Mohand Rao. Near Thapal Ismailpur, it joins Rajwa and Khandur Rao, carrying the combined waters of Khajnawar and Shahjahanpur Rao, as well as Hatni Hot and other streams. The entire river is then known as Solani, flowing southeast along the high bank marking the eastern boundary of the upland plain.

Just above the town of Roorkee on its left bank flows the Sipiya River, a long stream originating from the valleys of the Sakrauda plateau and fed solely by rainwater from numerous tributaries such as Haljaura, Jakhani, and Dhandora. The Solani Aqueduct, an important engineering marvel, was constructed in the 19th century under the supervision of Sir Proby Cautley. Built in 1846 over the Purani Ganga Canal (Old Upper Ganga Canal), it is a significant example of brick masonry construction, spanning 15 spans of 50 feet each. The aqueduct, 980 feet long, stands as a landmark in civil engineering, a testament to the advancements of its time. At Roorkee, the Solani Great Canal passes beneath the aqueduct, continuing southeast to the northern boundary of Mangalore, where it meets the Ratmau River.

For the past year, about 400 cusecs of water has been released into the Ratmau River through the old Roorkee canal at the Dhanouri dam. At this location, the old Roorkee canal directly meets the Ratmau River on the same level, with a canal built over the river. There is also a barrage here where the water falls approximately 50 feet. About 500 meters downstream, around 1000 cusecs of water is directed into the Ratmau River through a canal of the new Roorkee canal. When the Ratmau River meets the Solani River northeast of Tod Kalyanpur and Sundhari villages below Roorkee city, the Solani River's water flow increases. However, during the monsoon, the Solani River carries much more water. Before joining the Solani River at Ratmau, it has already been joined by eight drains at various points. After the Ratmau River joins, the flow of the Solani River significantly increases, mixing the

clean water with domestic effluents from 14 drains originating in Roorkee city. At this point, the Solani River appears clear and clean. This area is expansive, and after rainfall, farmers practice temporary agriculture within the river.

Moving forward, the Solani River enters Muzaffarnagar district. In Muzaffarnagar, the Solani River reaches the historic and religious city of Sukhtirth.

About one kilometer before the main bathing ghat of Sukhtirth, Ghantaghar, the Solani River merges with Banganga flowing from the east. The Banganga River begins from a Ganga river stream near Katarpur Alipur village, Bahadarabad tehsil, Haridwar district, Uttarakhand, reaching Sukhtirth in Muzaffarnagar district, Uttar Pradesh. Here, after absorbing the Solani, it merges into the Ganga River basin at Haidarpur Wetland, on the west side of the Ganga Barrage in Bijnor.

Haidarpur Wetland, a Ramsar site, is crucial for its ecological significance, providing habitat to various bird species, aquatic life, and flora. The wetland plays a critical role in groundwater recharge, flood control, and maintaining ecological balance in the region. Banganga travels about 70 kilometers before joining the Ganga River.

Banganga is highly polluted due to receiving substantial drainage from Laksar near Idrishpur village, as well as untreated sewage from nearby villages like Mahatauli, Tanda, Mubarakpur, Chamrawal, Nehandpur Suthari, and Muzaffarpur Gujra Jadid. The main tributary of Banganga is Pathri, originating from Shivalik and passing through Hetampur Bahadarabad before joining Banganga.

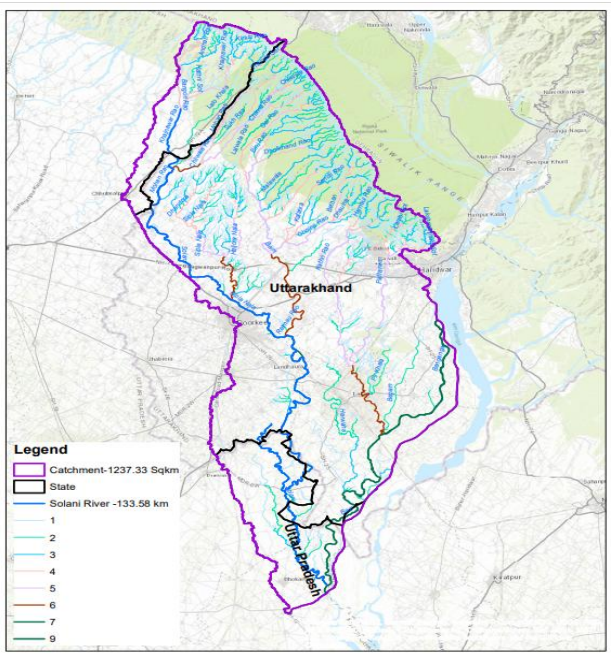
Banganga's flow is low initially but increases during the monsoon. At its source, Banganga relies solely on rainwater to maintain its flow. Currently, Banganga is fed by rainwater runoff, untreated sewage from towns/villages in its catchment area, domestic and industrial effluents via the Laksar drain, domestic sewage via the Sultanpur drain, and tributaries like the Pathri and Solani rivers.

30°12'06.6"N 77°49'31.4"E

Historical Background

Historically, the river has been revered not just for its ecological significance but also for its cultural and spiritual importance. However, over the past few decades, the Solani River has faced severe ecological degradation due to rapid urbanization, industrialization, and unsustainable agricultural practices. This report delves into the comprehensive rejuvenation efforts undertaken to restore the river, detailing the methods employed and the outcomes achieved.

Current State of the Solani River



The Solani River, stretching 133.58 kilometers, plays a vital role in the region's hydrological dynamics. Originating and flowing through a diverse landscape, it interacts with various land cover types within its catchment area of 1237.33 square kilometers. The catchment encompasses 10.21 square kilometers of water bodies, 194.43 square kilometers of built-up areas, and 8.8 square kilometers of bare ground. Additionally, the region includes 1145.21 square kilometers dedicated to crops, 0.01 square kilometers of flooded vegetation, 61.03 square kilometers of rangeland, and 540.44 square kilometers of tree-covered areas. This mosaic of land uses not only underscores the ecological diversity but also highlights the multifaceted interactions between natural and anthropogenic elements influencing the Solani River.

S.No.	Layer Name	Area SqKm and Length in km
1	Catchment Area	1237.33 Sqkm
2	Waterbodies	10.21 Sqkm
3	Built Area	194.43 Sqkm
4	Bare ground	8.8 Sqkm
5	Crops	1145.21 Sqkm
6	Flooded vegetation	0.01 Sqkm
7	Rangeland	61.03 Sqkm
8	Trees/Vegetation	540.44 Sqkm
11	Lineament	135.58 km
12	Solani River	133.58 km

Work to be Done for Solani River

From my three-day river survey, extensive river research, and my river rejuvenation experience, I have identified the Solani River as a living river. It has sustained millions in Uttar Pradesh and Uttarakhand and is a major tributary of the Ganga.

Presently, the Solani River faces three main challenges:

- Water scarcity post-rainfall
- Encroachment
- Pollution

While there is no direct industrial pollution in the Solani River, it receives significant domestic wastewater discharge. Fourteen drains from Roorkee city discharge directly into the Solani River, resulting in polluted water at various points. A sewage treatment plant (STP) with a capacity of 33 MLD has been established in Salier, Roorkee, supported financially by the Asian Development Bank and operated by KEC Company since April 30, 2019. Currently, only 5 to 6 MLD of sewage reaches the plant due to inadequate drain connections. The sewage reaching the plant is not adequately treated due to the absence of a dedicated electricity supply, although it was planned to have one. Presently, the plant operates intermittently using generators. Several drains in Roorkee are situated on the eastern side of the canal, making connection to the STP nearly impossible. Consequently, these drains remain untreated. Moreover, sewage from approximately a dozen villages/towns flows directly into the river. Farmers cultivate the riverbed and its catchment, and the river has been encroached upon for various purposes in numerous locations.

Causes of Degradation

1. **Urbanization**: The rapid expansion of urban areas along the Solani River has led to increased pollution from domestic sewage, industrial effluents, and solid waste. Unplanned urban sprawl has also resulted in the encroachment of riverbanks, disrupting the natural flow and reducing the river's capacity to self-cleanse.
2. **Agricultural Runoff**: The extensive use of chemical fertilizers and pesticides in agriculture has contributed to the pollution of the Solani River. Runoff from agricultural fields carries these harmful chemicals into the river, leading to eutrophication and the depletion of aquatic life.
3. **Industrialization**: The establishment of numerous industries in the region, particularly in Roorkee and its surrounding areas, has been a significant source of industrial pollutants entering the river. Effluents from these industries, often discharged without proper treatment, have severely contaminated the water quality.
4. **Deforestation**: The removal of vegetation along the riverbanks for agriculture and urban development has exacerbated soil erosion, leading to increased sedimentation in the river. This has reduced the river's depth and disrupted its ecological balance.
5. **Climate Change**: Changing weather patterns and reduced rainfall in the catchment area have further strained the already stressed Solani River, reducing its flow and exacerbating pollution levels.

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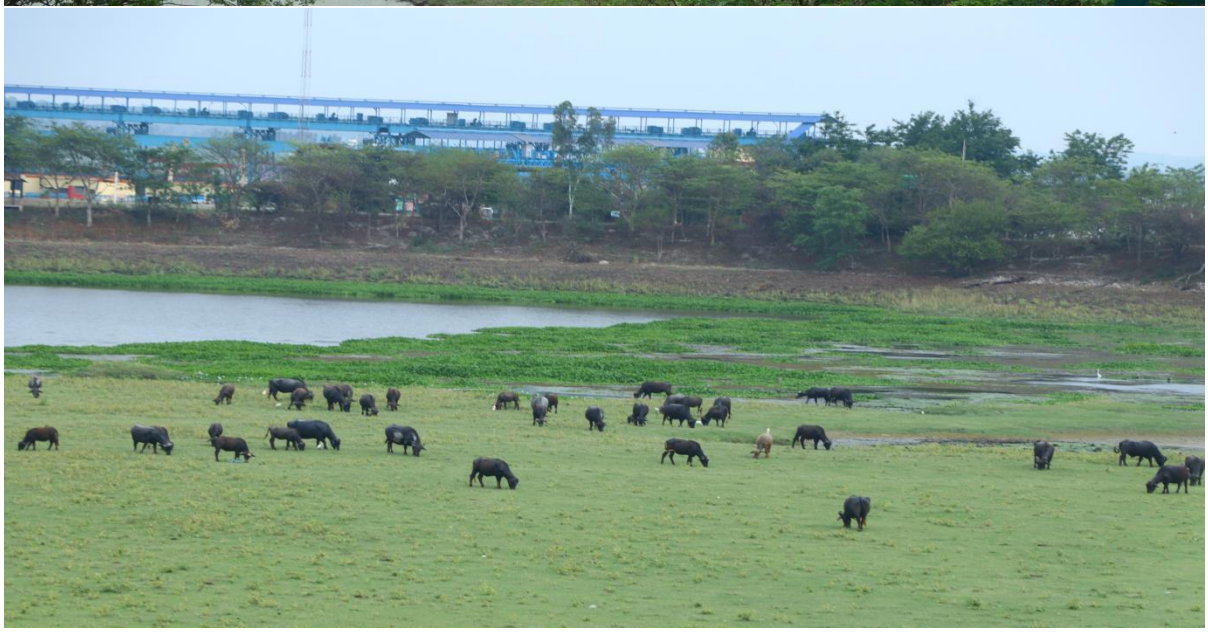

Rejuvenation Methods

To address the multifaceted issues plaguing the Solani River, a holistic and multi-pronged approach need to be adopted, involving governmental agencies, local communities, non-governmental organizations (NGOs), and environmental experts.

Initially a Solani River Council need to be formed which can carry out the supervision of rejuvenation process and monitoring of Sonali River after it is revived.

Solani River Council

Solani River Council is a group that will take all the social decisions regarding the arrangement of clean and uninterrupted flow of Solani and its tributary rivers. It will not be a constitutional organization but a social organization formed at the level of society. This organization will worry about its river and will also take decisions for its betterment. All decisions will be under Indian rules and regulations and will be taken without any discrimination. The decisions taken by Solani River Council regarding Solani River will be informed in writing to the District Magistrate / Chief Development Officer of the concerned district out of all the seven districts of the river flow at the administrative level and it will be necessary to get their consent in the works under the authority of the administration. Solani River Council will be provided technical support by the Bhartiya Nadi Parishad and GIZ India.

Structure of Solani River Council

The Solani River Council will be formed by the Pradhans and Secretaries of the villages situated on the banks of the river in both the districts of the river flow area. Out of all these Pradhans, one will be elected as the President, Vice-President and Secretary of the Council on the basis of majority. The President and Vice-President will be elected from among the Pradhans, while the Secretary will be elected from among the village secretaries. The Solani River flows through three districts of two states, Saharanpur, Roorkee and Muzaffarnagar, in such a situation, separate councils can also be formed in the three districts. By doing this, there will be no problem in working from administrative point of view. Along with this, the tributary rivers of Solani will also be a part of Solani River Council. ?

Village Committee

Solani River Council will include the Pradhans of the villages along the river flow. It will be the responsibility of the Pradhan of each village to form a committee of ten or more members of such aware people under his chairmanship in his village, which will do the work of river improvement in that part of the village. The village secretary will be the secretary of this committee. The village Pradhan will appoint an aware person as the vice-president on the basis of majority. The meeting of the village committee will be held on the 2nd of every month at the place and time decided by the consent of the Pradhan and the secretary. In the meeting, the old works will be reviewed and the outline of new works will be made. The work of writing down the agenda of the meeting and the decisions taken during the meeting will be the collective work of the vice-president and the secretary. A register will be made for

this. Although this village committee will also be a part of Solani River Council, but only the village Pradhan and the village secretary will participate in the meetings of the council.

Functioning of Solani River Council

The Solani River Council will meet on the first of every month at a fixed place (the place will be a village on the river bank) and time with the consent of the Chairman and Secretary. In the meeting, the previous works will be reviewed and plans for future works will be made. The work of writing down the agenda of the meeting and the decisions taken during the meeting will be the collective work of the Vice Chairman and the Secretary. If the cooperation of the administration is also taken in making plans for the decisions taken in the meeting and in implementing those works, then the work will be completed in a better way.

Rights of Solani River Council to take decisions:

Solani River Council will have the following rights to take decisions-

- Related to cleaning the river.
- Related to plantation of trees on the river bank.
- Related to revival of ponds on the river bank or in the villages on the river bank.
- Related to stop liquid and solid waste in the river.
- Related to public awareness in the villages on the river bank.
- Related to making dams in the river.

Apart from this, Solani River Council will be able to take any decision regarding the betterment of the river under the administrative rules and regulations. The Secretary of Solani River Council will be responsible for bringing all the decisions and works related to Solani River Council to the notice of the Chief Development Officer of the district, correspondence and approval of those works etc.

Publicity

A WhatsApp group of the members of Solani River Council will be formed. All the members of Solani River Council will be included in it. Apart from this, people participating in the river improvement works in the village can also be included with the consent of the Chairman of the Council. From time to time, news related to the river works and decisions of the meeting can also be given to the local newspapers with the consent of the Council Chairman. Apart from this, for publicity of the works being done for the river, mediums like creating a website, creating a Facebook page and creating a Twitter handle etc. can also be used.

Solani River Council & Saharanpur, Roorkee and Muzaffarnagar District

SN	Pradhan Name	Father/Husband	Position	Age	Education	Occupation	Village	Block	Contact
1			President						
2			Secretary						
3			Vice-President						

4			Member						
5			Member						
6			Member						
7			Member						
8			Member						
9			Member						
10			Member						
11			Member						
12			Member						
13			Member						
14			Member						
15			Member						
16			Member						
17			Member						
18			Member						
19			Member						
20			Member						

The rejuvenation methods can be broadly categorized into the following areas:

1. **Pollution Control and Waste Management**
    - **Sewage Treatment Plants (STPs)**: Establishing STPs along the major urban centers to ensure that domestic sewage is treated before being discharged into the river. These plants utilize advanced treatment technologies to remove contaminants and ensure the treated water meets environmental standards.
    - **Industrial Effluent Treatment**: Enforcing stringent regulations for industries to treat their effluents before discharge. Industries are mandated to install Effluent Treatment Plants (ETPs) and comply with environmental norms.
    - **Solid Waste Management**: Implementing comprehensive solid waste management systems in urban areas to prevent the dumping of waste into the river. This includes setting up waste segregation, collection, and disposal systems.
2. **Ecosystem Restoration**
    - **Afforestation and Riparian Buffer Zones**: Planting native vegetation along the riverbanks to prevent soil erosion, enhance biodiversity, and create natural filtration systems. These riparian buffers help in stabilizing the banks and filtering pollutants before they enter the river.
    - **Wetland Creation and Restoration**: Developing and restoring wetlands in the catchment area to act as natural water purifiers and provide habitat for wildlife. Wetlands help in sediment trapping, nutrient absorption, and maintaining the hydrological cycle.

   - **Bioremediation**: Employing bioremediation techniques using specific plants, microbes, and fungi to degrade pollutants in the river water. This natural method helps in reducing chemical contaminants and restoring the ecological balance.
3. **Water Resource Management**
   - **Rainwater Harvesting**: Encouraging the adoption of rainwater harvesting techniques in urban and rural areas to recharge groundwater levels and reduce surface runoff. This helps in maintaining the base flow of the river during dry periods.
   - **Check Dams and Reservoirs**: Constructing check dams and small reservoirs in the catchment area to store rainwater, reduce surface runoff, and promote groundwater recharge. These structures help in regulating the flow of the river and ensuring water availability during lean periods.
   - **Efficient Irrigation Practices**: Promoting water-efficient irrigation techniques such as drip and sprinkler irrigation among farmers to reduce water consumption and minimize agricultural runoff.
4. **Community Engagement and Awareness**
   - **Public Awareness Campaigns**: Conducting awareness campaigns to educate the local population about the importance of river conservation and the steps they can take to reduce pollution. Schools, colleges, and community centers are actively involved in these campaigns.
   - **Community Participation**: Encouraging local communities to participate in river monitoring, cleanup drives, and afforestation activities. Community-based organizations are empowered to take ownership of the river's health and actively contribute to its restoration.
   - **Sustainable Practices Promotion**: Promoting sustainable agricultural practices, such as organic farming and integrated pest management, among farmers to reduce the impact of chemical runoff on the river.
5. **Policy and Governance**
   - **Regulatory Framework**: Strengthening the regulatory framework to enforce environmental laws and regulations related to water pollution. This includes regular monitoring and penalizing violators to ensure compliance.
   - **Inter-agency Coordination**: Enhancing coordination between various governmental agencies, NGOs, and local bodies to ensure a unified and effective approach to river rejuvenation.
   - **Funding and Incentives**: Securing funding from government bodies, international organizations, and private sector initiatives to support rejuvenation projects. Providing incentives for industries and communities adopting sustainable practices.

Recommendations for the Permanent Revival of the Solani River

1. The name of the Solani River should be officially corrected from "Sonali" to "Solani" in NGT proceedings, aligning with historical and governmental documents.

2. Check dams and reservoirs should be constructed at the river's origin to retain rainwater, ensuring a consistent flow throughout the year, and providing water to wildlife.

3. Check dams should be built every five kilometres along the river's course below the Shivalik.

4. All the streams coming from Shivalik including the streams of Solani, Hindon etc., have been bringing a large amount of stones and debris for a long time, which has accumulated up to ten to fifteen feet in the flow of the stream below. In such a situation, the depth of all the streams including Solani in this area should also be increased.

5. Embankments should be constructed to prevent excessive spreading of the river in the Shivalik region.

6. The streams from Shivalik, including Solani and Hindon, have deposited considerable stones and debris over time, raising their bed levels by ten to fifteen feet. It is necessary to deepen these streams, utilizing the excavated debris for embankments and check dams. Increased depth will facilitate better water retention in these streams.

7. Immediate arrangements should be made to divert city sewage to the Roorkee STP.

8. Electricity supply to the STP should be ensured for regular operation.

9. For drains on the eastern side of the Roorkee canal, either a separate treatment plant should be constructed or natural treatment methods should be implemented. Various effective models exist across the country.

10. Natural methods should be adopted for treating sewage from villages and towns flowing directly into the river.

11. Riverbank demarcation should be implemented, and encroachments on river land should be removed. Permanent markers should be installed to prevent future encroachments.

12. Afforestation should be promoted in the vacant areas of the river basin.

13. Villages within one kilometre of both riverbanks should be considered part of the river basin. Ponds and lakes in these villages should be revitalized.

14. Solani River Councils should be established under village leadership in communities located within one kilometre of the riverbanks, involving them in river conservation efforts and public awareness campaigns.

15. Farmers should be encouraged to adopt chemical-free farming practices in these villages, with incentives for cultivating diverse fruit orchards on their land.

16. Agricultural activities within the river stream and its basin should be prohibited to prevent contamination from chemical fertilizers and pesticides.

17. Comprehensive river mapping should be conducted, including identification of fractured zones, to facilitate effective river management.

Implementation and Phases

The rejuvenation project was divided into several phases to ensure systematic implementation and continuous monitoring:

1. **Phase I: Baseline Assessment and Planning**
    - Conducting a comprehensive assessment of the river's current state, including water quality analysis, biodiversity surveys, and identification of pollution sources.
    - Developing a detailed action plan outlining the specific interventions required and setting measurable targets.
2. **Phase II: Infrastructure Development**
    - Constructing sewage treatment plants, effluent treatment plants, check dams, and rainwater harvesting structures.
    - Initiating afforestation and wetland restoration projects.
3. **Phase III: Community Engagement and Implementation**
    - Rolling out public awareness campaigns and involving local communities in river monitoring and cleanup activities.
    - Implementing sustainable agricultural practices and promoting water-efficient irrigation techniques.
4. **Phase IV: Monitoring and Evaluation**
    - Regularly monitoring water quality, biodiversity, and the effectiveness of implemented interventions.
    - Making necessary adjustments based on feedback and ongoing assessments.

Outcomes and Impact

The rejuvenation efforts will yield significant positive outcomes, contributing to the restoration of the Solani River's ecological health and improving the quality of life for the communities dependent on it:

1. **Improved Water Quality**: The establishment of sewage and effluent treatment plants can lead to a substantial reduction in the levels of pollutants in the river. Regular water quality monitoring will indicate a marked improvement in key parameters such as Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and levels of heavy metals and toxic substances.
2. **Enhanced Biodiversity**: Afforestation and wetland restoration projects will contribute to the revival of biodiversity along the river. Native plant species will be reintroduced, providing habitat for various wildlife species. Aquatic life, including fish and amphibians, has shown signs of recovery, indicating the restoration of ecological balance.
3. **Increased Groundwater Levels**: Rainwater harvesting and the construction of check dams may help in recharging groundwater levels, ensuring a steady

flow of water in the river even during dry periods. This will alleviate water scarcity issues for the local communities and improved agricultural productivity.

4. **Community Empowerment and Participation**: The active involvement of local communities in the rejuvenation efforts can foster a sense of ownership and responsibility towards the river. Community-led initiatives will play a crucial role in sustaining the project's momentum and ensuring its long-term success.
5. **Sustainable Agricultural Practices**: The promotion of sustainable farming techniques will reduce the reliance on chemical fertilizers and pesticides, leading to a decrease in agricultural runoff and its associated pollution. Farmers will report improved soil health and crop yields, demonstrating the benefits of environmentally friendly practices.
6. **Policy and Governance Reforms**: The strengthened regulatory framework and inter-agency coordination can ensure effective implementation and enforcement of environmental laws. Regular monitoring and penalties for non-compliance may create a deterrent effect, encouraging adherence to pollution control measures.

Conclusion

The rejuvenation of the Solani River stands as a testament to the power of collective action and the importance of adopting a holistic approach to environmental restoration. Through a combination of pollution control measures, ecosystem restoration, water resource management, community engagement, and policy reforms, the project can be successfully revived a vital waterway and improved the quality of life for the communities dependent on it. The positive outcomes might be achieved which can underscore the need for continued efforts to sustain the river's health and serve as a model for similar initiatives worldwide. As we move forward, it is imperative to build on the lessons learned and further strengthen our commitment to preserving and restoring our natural ecosystems for future generations.


Haiderpur Wetland
FIELD MAP
Haiderpur Wetland Western Road
Northern Road
Canal Side Road
PARKING ENTRY GATE
CAR PARKING AREA
TOILET COMPLEX
GARDEN
ACTIVITY AREA
INTERPRETATION CENTRES
Birds View Area
Private Land
01. Wetland Entry Gate
02. Watchman Hut
03. Car Parking Area
04. Ticket Counter & Shopes
05. Canteen
06. Nature Camp
07. Interpretation Center
08. Toilet Complex
09. Northern Watch tower 1
10. Northan Wooden Watch tower 2
11. Western Wooden Watch tower 3
12. Petroling Watch tower
13. Natural Trail
14. Birds View Area
15. Private Land
16. Patrolling Boat
Gull
Warbler
Rudy Shelduck
Greenshank
Grebe
Greyheaded lapwing
Bluethroat
Godwit

ANNEXURE 1:

LIST OF VILLAGES IN THE CATCHMENT OF SOLANI RIVER

S.No.	Village name	subdistric	district	state	lgd_vill
1	Rampur	Roorkee	Haridwar	Uttarakhand	56502
2	Ibrahimpurdeh	Roorkee	Haridwar	Uttarakhand	56492
3	Mohd Pur Bazurg Aht	Laksar	Haridwar	Uttarakhand	56795
4	Abdipur	Laksar	Haridwar	Uttarakhand	56902
5	Kuwan Khera Aht	Laksar	Haridwar	Uttarakhand	56798
6	Karaundi	Roorkee	Haridwar	Uttarakhand	56403
7	Kuwan Khera Must	Laksar	Haridwar	Uttarakhand	56797
8	Bhainsarhedi Ah	Narsan	Haridwar	Uttarakhand	56532
9	Alampur	Laksar	Haridwar	Uttarakhand	56915
10	Dhadhekidhana Majahidpur Aht	Laksar	Haridwar	Uttarakhand	56804
11	Jalalpur Mu	Roorkee	Haridwar	Uttarakhand	56505
12	Bhainsarhedi Mu	Narsan	Haridwar	Uttarakhand	56527
13	Shikarpur	Narsan	Haridwar	Uttarakhand	56592
14	Uleheri	Narsan	Haridwar	Uttarakhand	56531
15	Mandawar	Bhagwanpur	Haridwar	Uttarakhand	56347
16	Sisauna	Bhagwanpur	Haridwar	Uttarakhand	56352
17	Kishanpur Jamalpur	Roorkee	Haridwar	Uttarakhand	56404
18	Saliyer Salhapur	Roorkee	Haridwar	Uttarakhand	56406
19	Hazzarpur Ah	Narsan	Haridwar	Uttarakhand	56594

20	Sikanderpur	Laksar	Haridwar	Uttarakhand	56901
21	Hasanpur Madanpur M	Bhagwanpur	Haridwar	Uttarakhand	56345
22	Kagwali	Narsan	Haridwar	Uttarakhand	56624
23	Mukeempur Ah	Narsan	Haridwar	Uttarakhand	56611
24	Shahpur CT	Bhagwanpur	Haridwar	Uttarakhand	56627
25	Sikandarpur Mawal	Narsan	Haridwar	Uttarakhand	56619
26	Khanjarpur CT	Roorkee	Haridwar	Uttarakhand	56634
27	Lawwa	Bhagwanpur	Haridwar	Uttarakhand	56350
28	Naqibpur Ghosipura	Narsan	Haridwar	Uttarakhand	56615
29	Bheekar Gospur	Narsan	Haridwar	Uttarakhand	56616
30	Lodiwala	Bhagwanpur	Haridwar	Uttarakhand	56338
31	Toda Kalyanpur Ah	Roorkee	Haridwar	Uttarakhand	56508
32	Aurangzeb Pur	Bhagwanpur	Haridwar	Uttarakhand	56337
33	Ahamadpur Khedi	Bhagwanpur	Haridwar	Uttarakhand	56342
34	Dhadheki Dhana Majamidpur Must	Laksar	Haridwar	Uttarakhand	56803
35	Kanhapur M	Roorkee	Haridwar	Uttarakhand	56433
36	Makanpur Mahmood Alampur	Bhagwanpur	Haridwar	Uttarakhand	56354
37	Gin Mohd Shaheed Pur	Bhagwanpur	Haridwar	Uttarakhand	56351
38	Bhagwanpur CT	Bhagwanpur	Haridwar	Uttarakhand	56628
39	Puhana	Roorkee	Haridwar	Uttarakhand	56405
40	Chauli Shahbuddin Pur	Bhagwanpur	Haridwar	Uttarakhand	56348
41	Malakpur Latifpur	Roorkee	Haridwar	Uttarakhand	56503
42	Thoi	Narsan	Haridwar	Uttarakhand	56625
43	Madarpur	Laksar	Haridwar	Uttarakhand	56913
44	Jalalpur Ah	Roorkee	Haridwar	Uttarakhand	56507
45	Bangherimahabatpur Must CT	Roorkee	Haridwar	Uttarakhand	56635
46	Aamkheri	Narsan	Haridwar	Uttarakhand	56614
47	Khedi Shikohpur	Bhagwanpur	Haridwar	Uttarakhand	56341
48	Latifpur Khubban Pur	Bhagwanpur	Haridwar	Uttarakhand	56349
49	Sundhari	Narsan	Haridwar	Uttarakhand	56526
50	Hasanawala	Bhagwanpur	Haridwar	Uttarakhand	56336
51	Roorkee Npp	Roorkee	Haridwar	Uttarakhand	247848
52	Yahayyapur	Laksar	Haridwar	Uttarakhand	56903
53	Mundalana	Narsan	Haridwar	Uttarakhand	56613
54	Hazzarpur Mu	Narsan	Haridwar	Uttarakhand	56593
55	Zaurasi Mu	Narsan	Haridwar	Uttarakhand	56534
56	Zaurasi Ah	Narsan	Haridwar	Uttarakhand	56533
57	Abul Hasanpur Urf Ghisarpadi M	Narsan	Haridwar	Uttarakhand	56608
58	Abul Hasanpur Urf Ghisarpadi A	Narsan	Haridwar	Uttarakhand	56609
59	Mominpur	Hardwar	Haridwar	Uttarakhand	56696
60	Majri Akbarpur	Laksar	Haridwar	Uttarakhand	56788
61	Jogawala	Laksar	Haridwar	Uttarakhand	56945

62	Bhadoli	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110882
63	Nanupur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110879
64	Damaatpatti	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110877
65	Razkallapur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110890
66	Faridpur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110905
67	Hajipur Jahangirpur	Jansath	Muzaffarnagar	Uttar Pradesh	111327
68	Bulakipur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110876
69	Mandanwala	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110894
70	Nurnagar	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110865
71	Majlishpur	Jansath	Muzaffarnagar	Uttar Pradesh	111323
72	Bhadola	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110881
73	Sherpur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110891
74	Almawala	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110897
75	Firozpur Khadar	Jansath	Muzaffarnagar	Uttar Pradesh	111330
76	Sukertari	Jansath	Muzaffarnagar	Uttar Pradesh	111329
77	Kherki	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110887
78	Farakhpur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110889
79	Baikunthpur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110886
80	Chamrawala	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110895
81	Dadupur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110880
82	Panchli	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110888
83	Suheli	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110909
84	Marakpur	Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	110883
85	Sikari	Jansath	Muzaffarnagar	Uttar Pradesh	111319
86	Badshahpur	Behat	Saharanpur	Uttar Pradesh	109071
87	Khushalipur	Behat	Saharanpur	Uttar Pradesh	109070
88	Thappel Ismailpur	Behat	Saharanpur	Uttar Pradesh	109072

Annexure No. 2

CONSULTANCY WORK FOR FLOOD PLAIN ZONING IN ACCORDANCE WITH UTTARAKHAND FLOOD PLAIN ZONING ACT-2012 FOR SOLANI-RATMAU RIVER

CLIENT

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List of Abbreviation

S.No.	Abbreviation	Description
1	CWC	Central Water Commission
2	DEM	Digital Elevation Model
3	DTM	Digital Terrain Model
4	DGPS	Differential Global Positioning System
5	HFL	Highest Flood Level
6	GCP	Ground Control Points
7	PMP	Probable Maximum Precipitation
8	SUH	Synthetic Unit Hydrograph
9	LULC	Land Use land Cover
10	NDMA	National Disaster Management Authority
11	FPZ	Flood Plain Zoning
12	FFA	Flood Frequency Analysis

Abstract: -

India as a country has much of its concern towards natural calamities due to its location, topography, hydro-meteorological conditions. Out of many numbers of natural calamities flood constitutes one of the major national calamities faced almost every year resulting in substantial loss of life, large scale damage to property, disruption of community lifelines besides entailing untold misery to the millions. Concerted efforts have been made over the years to reduce the damage due to floods and mitigate the sufferings of the people. Various structural flood control measures were taken-up in the past including construction of reservoirs, embankments, drainage channels, etc. It is however, now realised that absolute and permanent protection to all flood prone areas and for all magnitudes of floods by structural measures alone is impossible due to constraints of time, money and land. So the emphasis will be on non-structural measures like Flood Plain Zoning and regulation, flood risk mapping, flood forecasting etc. to effectively supplement the structural measures for providing sustainable protection to flood affected areas.

Uttarakhand is an Indian Himalayan State known for its rich spiritual and religious tourism, ecological richness & diversity, and cultural ethos rooted in traditions, but it is also known for growing frequency and intensity of natural disasters and for its fragility of ecological and geological systems. Consisting mostly of uplifted sedimentary & metamorphic rocks and tectonically very active, the region is vulnerable to natural disasters. Due to its geo-climatic, ecological and socio- economic settings, Uttarakhand is one of the most disaster-prone States of the country.

Floods of varying magnitude, affect low lying areas and river valleys in Uttarakhand, due to variability in the monsoonal rainfall. However, the rapid increase of population and developmental activities in this hilly state aggravated the situation.

Cloudburst and related floods during August 1998 at Ukhimath (Rudraprayag) and Malpa (Pithoragarh), August 2001 at Phata (Rudraprayag), August 2002 at Burakedar (Tehri), August, 2012 in Asi Ganga (Uttarkashi), September, 2012 at Ukhimath (Rudraprayag) and June 2013 at Kedarnath (Rudraprayag), Feb 2021 in Rishi ganga and Dhauliganga are some of the examples of recent floods. Out of all the disasters the Kedarnath flood remain the worst.

Executive Summary: -

Flood as a natural disaster is a sensitive issue for the Himalayan state like Uttarakhand. The magnitude and frequency of the flood are increasing from year to year. There are number of occasions of such flood disasters that happened over near past are of Kedarnath flood of 2013, Joshimath flood of 2021, and the flood over most part of Uttarakhand during 2023. A huge number of life & properties is lost during the disasters which is creating a socio-economic imbalance in the state. July 2023 saw 201.4 mm of rain, which is 14% more than the normal of 176.8 mm which was observed one the heaviest rainfall in past few years

There are number of measures to mitigate the effect of flood like Structural and Non-structural measures. Due to the involvement higher cost, time and land requirements the structural measures are scarcely used whereas due to easy implementation processes the non-structural measures like flood plain zoning, flood risk mapping, flood warning/forecasting are largely implemented. While flood plain zoning is a proven technique for reducing the flood damages, the state of Uttarakhand has adopted this in principle to delineate the flood plain zoning lines in order to demarcate the areas along the flood plains according to the effect of flood damages as per NDMA guidelines.

The entire rivers selected for flood plain zoning are divided in three lots. The rivers Solani and Ratmau falls in Lot number 3. Initially the survey work of the flood plain is done by using DGPS, Total Station as well as Drone Survey. The appropriate Digital Elevation Model is also procured for use in Hydraulic model. The rainfall and discharge data is collected from respective sources. Due to non-availability of sufficient discharge data, the two rivers are treated as ungauged and the discharge calculation is done on the concept of Synthetic Unit Hydrograph. The maximum rainfalls have been obtained from PMP ATLAS and disaggregation of the data is done as per the defined process. The design discharge is obtained after performing critical sequencing of the rainfall. The discharge values are obtained for the 5-, 25-, 50- and 100-year return periods.

The hydrodynamic modelling is applied to the obtained design discharge. The HEC-RAS software is used to make the analysis. Both 1-D and 2-D modelling analysis is done to the given data. The cross-sections obtained at 50m interval, the DEM data, DGPS survey data are combined together

for a hybrid DEM which remain the input for our model. The design discharge data remain the hydrologic input for the model. The local Manning's Constant (n) values are taken as per the river stretch configuration. The outputs in the form of flood lines corresponding to 5, 25, 50 and 100-year flood lines are obtained which are communicated to field staff for putting the marks at field at 50 m intervals. The same has been done in presence of field staff as well as the Survey team.

The task of placing the flood lines in the Shajra map is essential for finalising the flood inundation lines as well as fixing the flood zones i.e the restrictive, prohibitive and warning zones. The same has also been done and submitted to appropriate authority. Mean time two workshops were held at Irrigation department Seminar Hall, one on 7th Oct. 2023 where the discussion on study area and approach & methodologies were discussed and in the second workshop on 12th March, 2024, the outcomes of the analysis basically the flood lines and implementations are discussed. The remarks and suggestions for improvements/corrections were gladly accepted and rectified in the present report.

The flood plain zoning work is highly essential for the rivers as the utility of flood plain is important due to the land constraints. Further the frequency of flood and climate change driven floods are more frequent now. So, in one hand the safety of life and property and in other the increasing the utility of land have to be balanced. In that context, making flood plain zoning for sensitive rivers is the foremost step.

This study regarding flood plain zoning completes all the scopes assigned to the specific problem.

Expecting a healthy co-operation from all

Warm Regards

VISIONTEK CONSULTANCY SERVICES PVT LTD
BHUBANESWAR

1. Introduction

The floods are usual phenomena at Uttarakhand state. The network of rivers coming from hills, passing through a tough terrain and finally reaching at plains and the high slope encountered during their travel makes the scenario difficult when a high intense rainfall continues for a significant duration. Many damages and loss of lives and properties are recorded during past and few of them of recent times are presented.

1.1 Kedarnath Flood (June 16-17,2013)

Over Sunday and Monday, June 16-17, 2013, when a series of cloudbursts wreaked havoc in 5 districts of Rudraprayag, Uttarkashi, Chamoli, Pithoragarh and Tehri, there were nearly 12,000 people at Kedarnath and Gaurikund the stretch that bore the brunt of the deluge. Ten days later, about 6,000 had been rescued from Kedarnath. More than 800 bodies were recovered in and around Kedarnath. Hundreds were reported missing.

Fig-1:- Flood at Rishikesh:-

The cloudbursts led to flash floods that swept away mountainsides, villages, people, animals, houses, trucks, cars, roads... nothing escaped. Nothing survived, it had no hope of surviving. The first of the cloudbursts-signalled by something that sounded like a sudden explosion that shook most of the houses--at Kedarnath took place around 7.30 pm on June 16. The check dam behind the temple crumbled and water gushed towards the temple. A second cloudburst on the morning of June 17 made the Chorabari Tal breach its walls. The massive amount of water released from the lake, combined with that of the incessant rain, flowed down and brought with it a massive

mudslide that dislodged boulders and brought them down. All those structures that had withstood the previous night's onslaught perished under the sheer speed and weight of the water.

The floodwaters weren't content with ravaging the town of Kedarnath. As it flowed downhill towards flat land, it went through nearly 200 villages with such terrifying speed that the villagers had little or no time to escape. The result: houses, two-three storey buildings came crashing down as the floodwaters washed away the earth they were standing on, people and livestock were no exceptions. Roads and bridges soon became part of the debris the water was carrying with it.

1.2 Flood of Year 2021: -

On Sunday morning of 7th February 2021 at 10:08Hrs, a massive flash flood took place along Rishi Ganga River valley of Chamoli district. As per the official records, among 204 died people only 80 dead bodies retrieved and 124 people's bodies still missing which were later declared dead after long search operation. In this flood, Rishiganga Hydropower project and under construction Tapovan Vishnugad Hydropower project were also extremely damaged. In addition, flood also dismantled a bridge near the confluence of Dhauliganga and the Rishiganga (1985m.a.s.l.). Several disturbing live footages recorded by eyewitness were surfaced online through news channels and social media platforms. In the immediate aftermath of the event, based on the recorded videos, it was speculated that the flood was most probably triggered by

Glacial Lake Outburst Flood (GLOF) event. However, early aerial surveys and available satellite imagery data confirmed that the flash flood was triggered by failure of a massive rockslide just below Ronti peak in the Nanda Devi massif.(Singh et.al.2022)

Among the places most severely hit by the floods are Joshimath, Rini, Nanda Devi National Park, Tapovan Vishnugad Hydropower Plant and Sridhar.

The disaster left over 200 killed or missing. As of May 2021, "83 bodies and 36 human body parts out of a total of 204 people missing have been recovered so far. Of the missing and dead, 140 were workers at the Tapovan Hydropower Plant site.

1.3 Flood Plain Zoning

The basic concept of flood plain management is to regulate the land use in the flood plains in order to restrict the damage due to floods, while deriving maximum benefits from the same. This is done by determining the locations and the extent of areas likely to be affected by floods of different magnitudes/ frequencies and to develop those areas in such a fashion that the resulting damage is minimum in case the floods do occur. Flood Plain Zoning, therefore aims at disseminating, such 'potential loss' information on a wider basis so as to regulate indiscriminate and unplanned development in flood plains and is relevant both for unprotected as well as protected areas.

Flood Plain Zoning recognises the basic fact that the flood plains are essentially the domain of the river, and as such all developmental activities in flood plains must be compatible with the flood risk involved. Heavy encroachment of flood plains has been responsible for increasing trend of damage over the years. The need for Flood Plain Zoning has received recognition at various fora in the past also.

As far back as 1973-74, the Central Water Commission (CWC) had prepared guidelines 18 for Flood Plain Zoning which were approved by the Central Flood Control Board. Since the implementation of these guidelines needed statutory backing, CWC also prepared a model draft bill which was circulated in 1975 by the then Ministry of Irrigation, Government of India, to all the States advising them for enactment of a suitable legislation. In pursuance of the provisions of clause (3) of Article 348 of the constitution of India, the Uttarakhand Government passed the Uttarakhand Flood Plain Zoning Act 2012. The aftermath of 2013 Kedarnath flood, the Honourable Supreme Court and the Honourable National Green Tribunal (N.G.T.) has taken a serious note of that and in the lights of the directions passed by Honourable Supreme Court and subsequently by the Honourable N.G.T., it becomes imperative to decide the limiting boundary for rivers/streams in Uttarakhand. For regulating land use in different flood zones, the National Disaster Management Authority (N.D.M.A.) has classified following priorities in respect of construction of buildings and other utility services (Table 1).

1.4 Objective of Study

Flood-plain zoning is a concept for flood plain management. It recognizes the basic fact that the flood plain of a river is essentially its domain and any intrusion into or developmental activity

therein must recognize the river's ‘right of way’. Flood plain zoning measures aim at demarcating zones or areas likely to be affected by floods of different magnitudes or frequencies and probability levels, and specify the types of permissible developments in these zones. The objective is to document flood plain boundaries based on channel configuration, geometry, bed form and profile characteristics of the identified major rivers of Uttarakhand together with their hydraulic characteristics and to identify areas/stretches where the stream flow is likely to have adverse impact on human interests during spells of high discharge caused by flood or flash flood. It will include flood plain Zoning based on the modelling results for the characteristic discharges calculated for the said streams (flood frequencies of say 5 years, 25 years, 50 years, and 100 years return period). The study is also intended to provide detailed account/database for engineering design and others, of the various flood control/mitigation measures and channel improvement measures near habitations along the river course so as to reduce the impact of the flood disaster on human life, property and adjoining habitation.

1.5 Scope of Works

The scope of work in the light of objectives discussed above shall include stipulated tasks under following heads which shall be completed as per NDMA guidelines.

1. Preparation of Digital /Survey maps of the streams as mentioned above, showing all the major cities, towns, semi urban development using satellite imageries or suitable latest techniques.

2. Preparation of Detailed Maps showing habitation around the rivers.

3. Calculation of Characteristic flood discharges of all the major streams based on flood frequency analysis.

4. Defining the streams in the sensitive reaches based on the results found as per para 4 above.

5. The prime objective of this assignment is to restrict/prohibit the human activities in the river flood plains. Since the reserve forests/national parks are already protected by law hence the river reaches falling in these areas will be excluded from the study. However civil lands having forest cover will be included.

6. Tabulation of flood plain boundary limit in various cities /towns villages, in general depending on desired waterway to pass the characteristic discharge.

7. Preparation of digital /GIS map showing the defined prohibitive, regulating, and warning zone as per NDMA flood plain zoning guidelines.

8. Preparation of digital GIS maps showing flood plain boundaries for floods of return periods and the map will be prepared showing the defined zone boundary.

9. To estimate water surface profiles employing hydro-dynamic river flow model.

10. All survey work & data acquisition from different agencies will be done by the consultant.

11. Consultant shall assist the department to clarify the methodology and other technical issues related to the task, before the Govt., Honorable N.G.T. or any other court if required.

12. River Cross-section Interval in habitations the cross-section interval should not be more than 50 m c/c. In other habitable reaches this interval should not be more than 500m. In hilly/forest areas the cross-section interval may be chosen suitably for the required level of accuracy.

1.6 NDMA Guidelines

The scope of work provided above and the expected deliverables are inline to meet the guidelines provided by national Disaster Management Act Jan 2008. Below are the guidelines from the NDMA document: In the regulation of land use in flood plains, different types of buildings and utility services can be grouped under three priorities from the point of view of the damage likely to occur and the flood plain zone in which they are to be located:

Table 1: NDMA guidelines for Flood Plain & Land Utilization

Priority	Reach
Priority 1	• Defence installations, • Industries, • Public utilities like hospitals, electricity installations, water supply, telephone exchanges, aerodromes, railway stations, commercial centres, etc. Buildings should be located in such a fashion that they are above the levels corresponding to a 100-year frequency or the maximum observed flood levels. Similarly, they should also be above the levels corresponding to a 50-year rainfall and the likely submersion due to drainage congestion.
Priority 2	• Public institutions, • Government offices, universities, public libraries and residential areas. -Buildings should be above a level corresponding to a 25-year flood or a 10-year rainfall with stipulation that all buildings in vulnerable zones should be constructed on columns or stilts as indicated above.
Priority 3	• Parks and playgrounds. -Infrastructure such as playgrounds and parks can be located in areas vulnerable to frequent floods. • Since every city needs some open areas and gardens, by restricting building activity in a vulnerable area, it will be possible to develop parks and play grounds, which would provide a proper environment for the growth of the city.

1.7 Methodology: -

Besides the gauged locations the other locations where scanty or intermittent flow data are available does not give a clear scenario of the flow pattern. At ungauged locations, determining the discharge is always a challenge for doing subsequent hydrological analyses. Simultaneously it is also difficult to put the gauges at all salient locations. Numbers of techniques are used in resolving the problems of data availability at ungauged locations such as:

One of the most frequently used events in hydrology is the relation between rainfall and runoff. It determines the runoff signal which leaves the watershed from the rainfall signal received by the

basin. In it, a part of the hydrological cycle has been studied to express the runoff from the catchment as a function of the rainfall and other catchment characteristics. It helps to extend stream flow time series both spatially and temporally to estimate management strategies and catchment response to climate. There are various popular flood hydrograph modeling techniques for ungauged basins, like the synthetic unit hydrograph (SUH). The SUH models are grouped into four main classes, as follows: (a) conceptual models (b) traditional or empirical models (c) probabilistic models (d) geomorphologic models. The unit hydrograph (UH) theory is a potentially powerful tool in watershed hydrology similar to the unit-impulse response function in fields such as electrical, electronics and telecommunication or and structural engineering (Gavahne and Londhe, 2021).

The Synthetic Unit Hydrograph approach is used in many studies in order to find the design floods of different ungauged catchments. The parameters related to physiographic as well as hydrometeorology based on the regionalization property has been well defined by CWC. Accordingly, CWC divided entire India in to 7 hydro-meteorological zones and 26 sub zones as mentioned in the diagram below:

Whenever we are going for the flood Plain zoning works so in that case, we have two types of catchments first one is gauged catchment and the other one is ungauged catchment so the discharge calculation will depend on the type of catchment weather it is gauged or ungauged. Here we will mention the discharge preparation steps for different return period and modeling steps for gage catchment and engagement catchment separately.

For Gauged Catchment:

To estimate the design flood using flood frequency approach, the following procedures shall be adopted:

(a) The flood peak series shall be checked for randomness, homogeneity, trend, jump, outliers etc using appropriate statistical methods.

(b) Flood frequency analysis shall be carried out using time series of instantaneous annual flood peak. Based on the hourly gauge data the observed annual flood peak shall be converted into instantaneous flood peak.

(c) Using the instantaneous annual flood peak time series, the flood frequency analysis shall be carried out using standard frequency distributions such as Gumbel, log Pearson type-III and Log Normal distributions etc. to estimate the desired return period flood.

(d) Goodness of fit test for the frequency distribution shall be carried out using standard statistical tests such as Chi Square, D-Index etc. to assess the appropriate frequency distribution for the data set and decide the appropriate design flood.

a) Normal Distribution

Analysis by using the Normal distribution uses the formula as below:

$Q_T = \bar{Q} + K_T\sigma$

Where:

Q_T = the probable discharge with a return period of T years

$\bar{Q}$ =mean flood (for n years)

K_T= frequency factor

σ = Standard deviation of data

The tables presented below summarize calculated discharges for different return period based on the Normal distribution.

b) Log-Normal Distribution

The formula used for estimation of discharges for any return period in the method is written as:

$$\log Q_T = \log(Q)_{avg} + K_T\sigma$$

Where:

Q_T = the probable discharge with a return period of T years

log(Q)avg. = average of the log Q discharge values

K_T= frequency factor (referred from for return period)

σ = the standard deviation of the log Q values

c) Log Pearson Type III Distribution

The formula used for estimation of discharges for any return period in the method is written as:

$$logQ_T = \log(\overline{Q}) + K_T\sigma$$

Where:

Q_T = the probable discharge with a return period of T years

$\log(\overline{Q})$ = average of the log Q discharge values

K_T= frequency factor (referred from standard table based on skewness coefficient Cs and return period)

σ = the standard deviation of the log Q values

d) Gumbel Extreme Value Type 1 Distribution (GEVT – 1)

The formula used for estimation of discharges for any return period in the method is written as:

$$Q_T = \bar{Q} + K_T\sigma$$

Where:

Q_T= the probable discharge with a return period of T years

$\bar{Q}$ = mean flood (for n years)

K_T= frequency factor = $(Y_T - Y_n)/ \sigma_n$

σ_n = Standard deviation of data

Y_T = - Ln (Ln (T/T- 1))

Y_n, σ_n = expected mean and standard deviations of reduced extremes to be found from Gumbel's table based on number of year of data available.

Here also mentioning below the flow chart which explains the holistic approach for flood plain zoning works for Gauged catchments

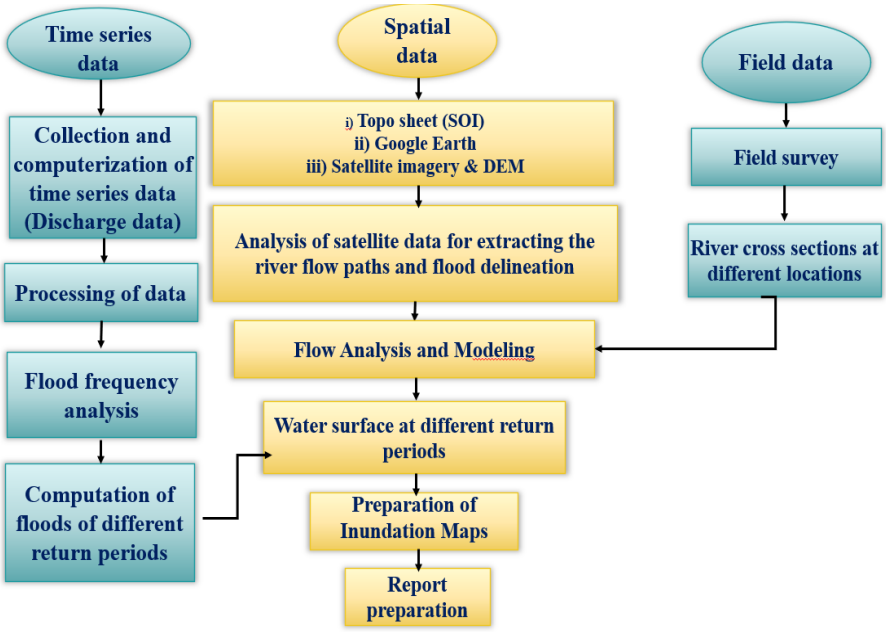


Fig.2 Flowchart of methodology of Flood Plain Zoning

For Ungauged Catchment

The availability of historical discharge data is the prime information required to proceed for Flood Plain Zoning (FPZ) analysis. The major sites sensitive to FPZ are not within the vicinity of the gauged site. So the analysis for ungauged analysis is to be taken care of. Besides the gauged locations the other locations where scanty or intermittent flow data are available does not give a clear scenario of the flow pattern. At ungauged locations, determining the discharge is always a challenge for doing subsequent hydrological analyses. Simultaneously it is also difficult to put the gauges at all salient locations. Numbers of techniques are used in resolving the problems of data availability at ungauged locations such as:

One of the most frequently used events in hydrology is the relation between rainfall and runoff. It determines the runoff which leaves the watershed from the rainfall received by the basin. In it, a part of the hydrological cycle has been studied to express the process of runoff from the catchment as a function of the rainfall and other catchment characteristics. It helps to extend stream flow time series both spatially and temporally to estimate management strategies and catchment response to climate. There are various popular flood hydrograph modelling techniques for ungauged basins,

like the synthetic unit hydrograph (SUH). The SUH models are grouped into four main classes, as follows:

(a) Conceptual models

(b) Traditional or empirical models

(c) Probabilistic models

(d) Geomorphologic models.

The unit hydrograph (UH) theory is a potentially powerful tool in watershed hydrology similar to the unit-impulse response function in fields such as electrical, electronics and telecommunication or and structural engineering (Gavahne and Londhe, 2021).

The Synthetic Unit Hydrograph approach is used in many studies in order to find the design floods of different ungauged catchments. The parameters related to physiographic as well as hydrometeorology based on the regionalization property has been well defined by CWC. Accordingly, CWC divided entire India in to 7 hydro-meteorological zones and 26 sub zones as mentioned in the Figure-3 below:

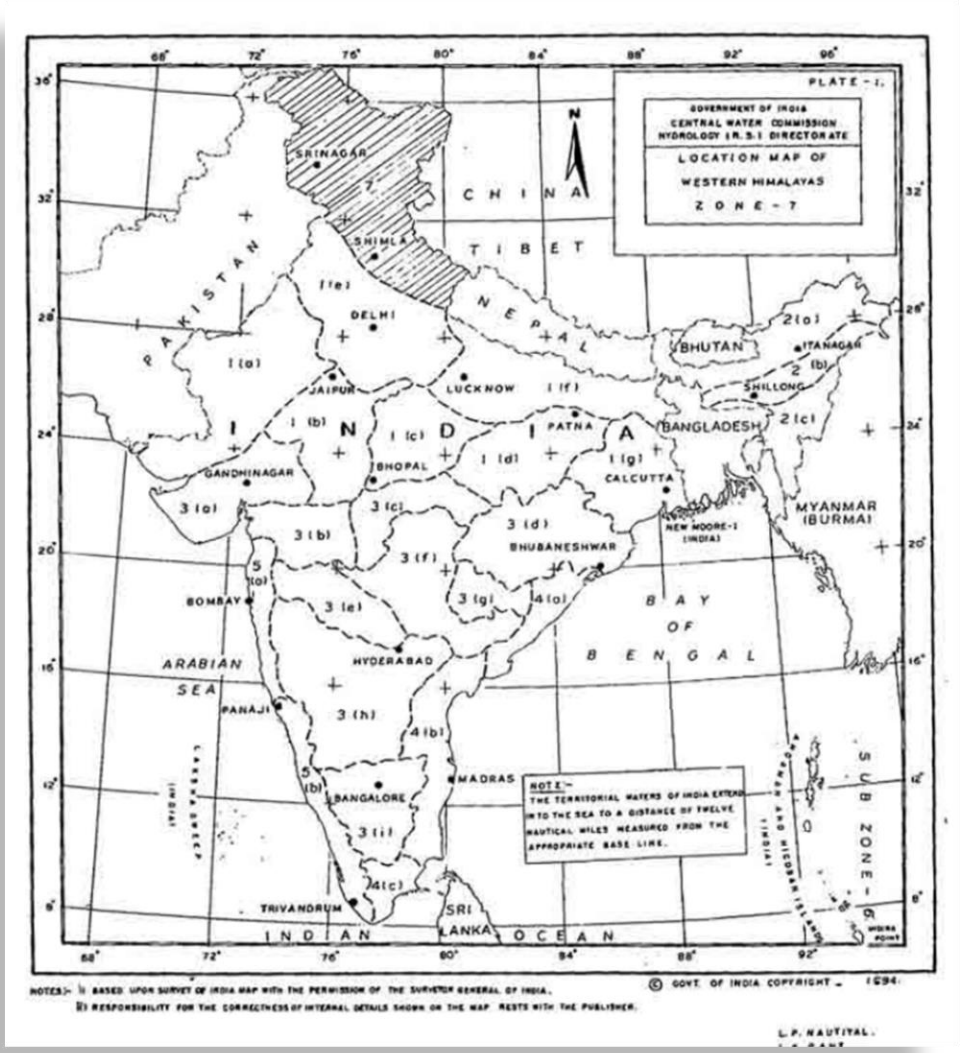


Fig. 3 Hydro-meteorological sub-divisions of India

As our study area, falls under Western Himalayas it comes at Zone-7. The equations for developing the Synthetic Unit Hydrograph have to be followed by the guidelines provided by CWC. The steps to be followed regarding the calculation of parameters for individual ungauged sites are shown in Fig. 4, Fig.5 and the parameters are calculated through the equations mentioned in Table 2.

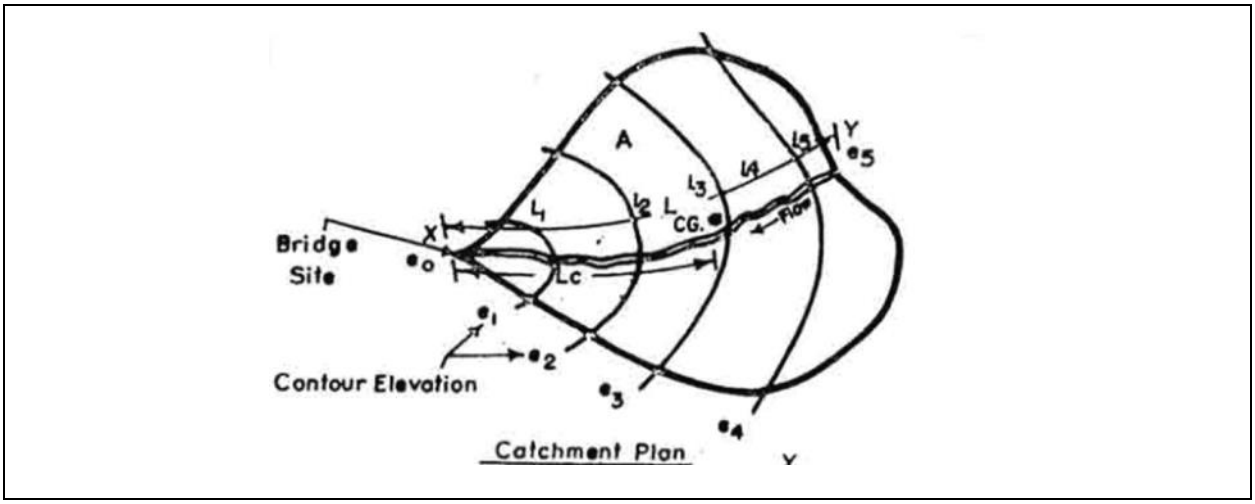


Fig.-4 Catchment plan for ungauged sites

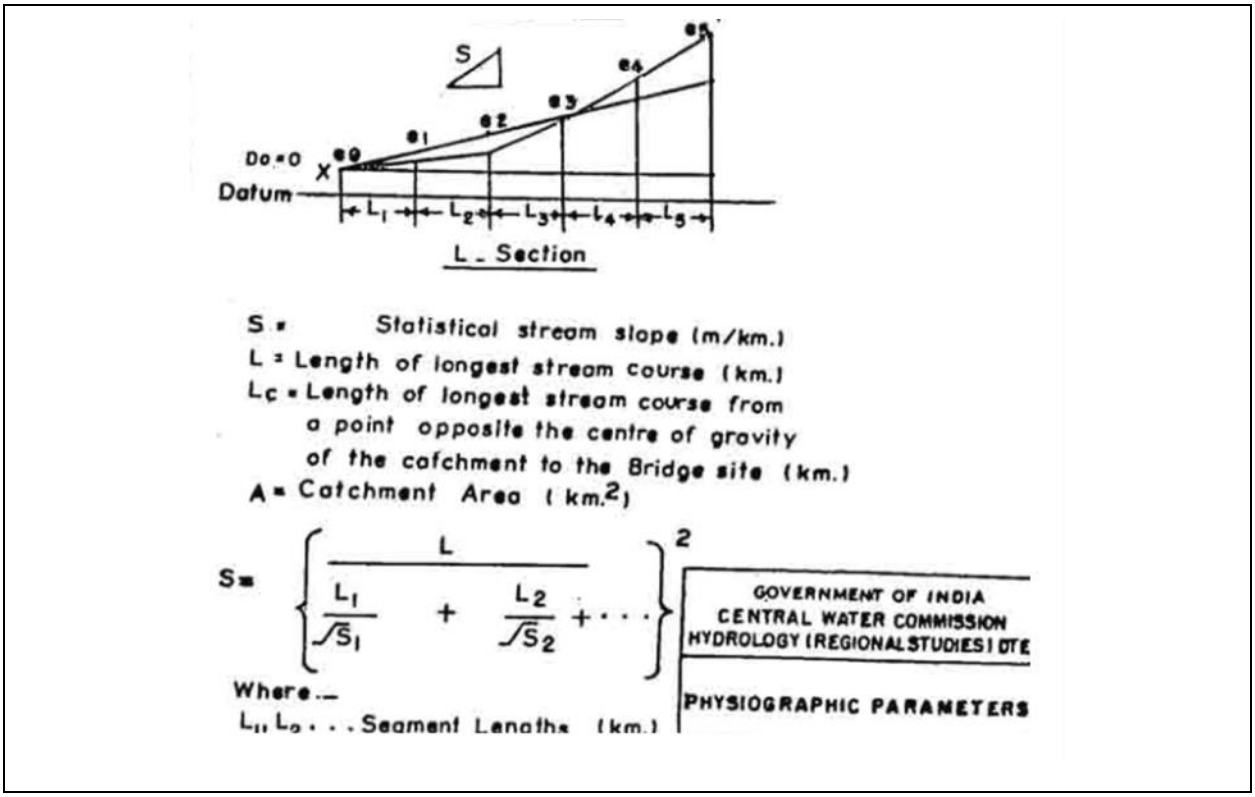


Fig.-5 Slope and other physiographic parameter calculation

Table 2: Parameter calculation according to the equation for Western Himalayan Zone-7
Time from the centre of effective rainfall duration to the UH peak $t_p = 2.498*(L*L_c/S)^{0.156}$
Peak discharge of unit hydrograph per unit area $qp = 1.048*(tp)^{-0.178}$
Width of the UH measured at 50% of peak discharge ordinate $W_{50} = 1.954*(L*L_c/S)^{0.099}$
Width of the UH measured at 75% of peak discharge ordinate $W_{75} = 0.972*(L*L_c/S)^{0.124}$
Width of the rising limb of UH measured at 50% of peak discharge ordinate $W_{R50} = 0.189(W_{50})^{1.769}$
Width of the rising limb of UH measured at 75% of peak discharge ordinate $W_{R75} = 0.419(W_{75})^{1.246}$
Base width of UH $T_B = 7.845*(t_p)^{0.453}$
Peak Discharge of UH $Q_p = q_p$ x A
Unit duration of unit hydrograph t_r
Time from the start of rise to the peak of the UH $Tm=t_p+t_r /2$
$Q_{theoretical} = A*d/0.36*t_r$ here d= 1 cm depth and t_r = 1 hr

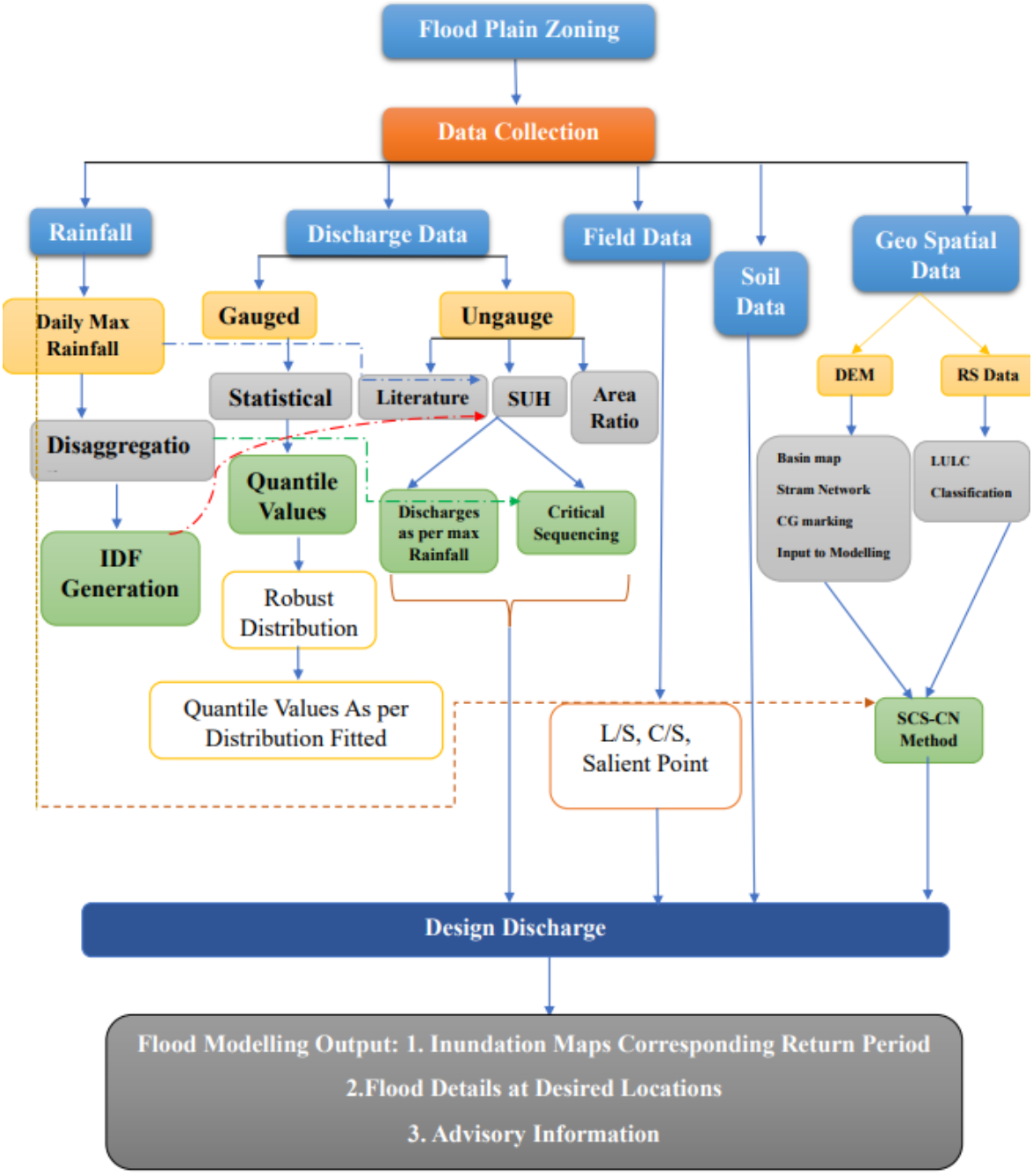


Fig.-6 Steps for Design Discharge calculations and subsequent modelling

1.8 Hydraulic Modelling

Hydraulic characteristics like Water Surface Elevation have great importance to study the behavior of Flood Plain zone in response to flow hydrograph. A hydrodynamic model is a tool to describe or represent the motion of water. Before the advent of widely available computer systems, a hydrodynamic model could in fact be a physical model built to scale. However, virtually all hydrodynamic models in use today are computational numerical models. Here, HEC-RAS has been employed to study the hydrodynamics of the river. Hydraulic Models Simulating the fluvial hydraulics of a reach of river, including the channel and over bank, can be performed using a variety of mathematical computer models depending on the type of study and model the user wants to employ.

The United States and many other developed countries utilize hydraulic modelling as a tool to gain an in-depth perspective of hydraulic systems so that they can more effectively develop different mitigation measures at the time of flood, planning for bridges, embankment, levees and dams. Numerical hydraulic modelling involves the use of mathematical equations representing the fundamental physics of how water moves in order to gain a better understanding of the hydraulic system's behaviour. It takes into account more than just the topography of the land and the amount of water in the system. Hydraulic modelling takes into account time, land use/land cover, conveyance area, basic physics of water behaviour, and water volume to portray the effects a river can have on the surrounding community.

1.9 HECRAS Model

HEC-RAS, a hydraulic model developed by the USACE, is extensively applied in calculating the hydraulic characteristics of rivers. It is an integrated program and uses the following energy equation for calculating water surface profiles.

$$Y_2 + Z_2 + \frac{\alpha_2 V_2^2}{2g} = Y_1 + Z_1 + \frac{\alpha_1 V_1^2}{2g} + h_e$$

Y, Z, V, α, he, and g represent water depth, channel elevation, average velocity, velocity weighting coefficient, energy head loss, and gravitational acceleration; and subscripts 1 and 2, respectively, show cross sections 1 and 2.

This program provides user to input data, data correction, to receive output display and analysis. HEC-RAS model needs details of river cross sections and upstream flow rate. The water depth and mean velocity are calculated for a given cross section using the energy conservation equation HEC-RAS calculates the water levels variation along the channel and the water level values are overlaid on a Digital Elevation Model (DEM) of the area to get the extent and flood depth using GIS. Spatial data like cross section, river reach, stream network, flow paths, and others have been obtained using HEC-GeoRAS (Arc-GIS extension) and these data then transferred to HEC-RAS.

The U. S. Army Corps of Engineers (USACE) developed HEC-RAS, and it is the latest product of 90 years of hydraulic modelling experience in the United States. Hydraulic modelling development began in the United States after a major flood event on the Mississippi River in 1927 prompting the USACE to begin exploring options to prevent flooding. The Hydrologic Engineering Center (HEC) is a branch of the USACE that was established for the purpose of researching and developing new techniques to deal with the effects of floods (US Army Corps of Engineers). HEC originally began developing physical models to simulate river flow, but as technology progressed, computer programs that could simulate floods were developed. The computer models were then used to predict water surface profiles in response to potential future flood events and better prepare. The latest update on the program, HEC-RAS 5.0.3 includes capabilities to model the hydraulics of a river both one and two dimensionally. The three governing equations of hydraulics are the energy equation, the momentum equation, and the continuity equation. One-dimensional HEC-RAS uses a variation of the energy equation in a procedure called the standard step method to calculate the water surface elevation corresponding to different discharges flowing through the hydraulic system being modelled.

Two dimensional HEC-RAS takes into account mass conservation using the continuity equation and momentum conservation using variations of the momentum equation called the Saint Venant equations, based on Newton's second law of motion and assuming incompressible flow. The area being two-dimensionally modelled is divided into a grid where each cell is treated as a control volume. Each cell is a polygonal prism with irregular terrain on the bottom, developed from the topography data. The lateral flows are calculated in the x and y direction using the Saint Venant equations, which account for internal and external forces on the fluid, specifically hydrostatic

pressure, turbulence, and friction. Then using the continuity equation, the lateral flows in and out of every side of the cell, expressed as velocities, are used to calculate the volume of water in the cell and area of each cell face, as a function of water surface elevation.

Both one-dimensional and two-dimensional models were considered plausible options for the project and desired outcomes because HEC-RAS one dimensional and two-dimensional models are on the Federal Emergency Management Agency's (FEMA) list of nationally accepted hydraulic models for developing flood mitigation measures. The most significant challenge in developing hydraulic models for India is that many of the country's rivers are not gauged and hydrologic/hydraulic data are not widely collected. Moreover, the data that are collected are not easily accessible and not always of the quality preferred for hydraulic model development The Hydrologic Engineering Center – River Analysis System (HEC-RAS), is a hydraulic modelling software widely accepted and used because it has proven to be reliable software and is freely available making it easily used by countries with limited resources (US Army Corps of Engineers). Both one-dimensional and two-dimensional version were chosen for the work described in this report. HEC-RAS 5.0.3, which includes two-dimensional capabilities, was recently released and is expected to become as prominent as the one-dimensional version (Brunner, HEC-RAS River Analysis System, 2D Modelling User's Manual Version 5.0.3).

The general data required to build a hydraulic model are

1.) Surface roughness values typically derived from land use/land cover (LULC) data
2.) A digital elevation model (DEM) derived from topographic data, and observed hydraulic data (discharge and stage).

The surface roughness values can be estimated from satellite imagery if LULC datasets are not available. The DEM forms the conveyance area of the model, and thus, can greatly affect the output of hydraulic models.

1.10 Data Needed for Model Development

There are three main data inputs required to build a model. First is the discharge or flow of water entering and exiting the model. The discharge flowing into or out of the model and the corresponding locations along the outer perimeter of the flow area are referred to as boundary

conditions. Second is the Manning's "n" roughness coefficients representing the land's frictional resistance to flow derived from land use data. Third is the topography of the model area in the form of a digital elevation model (DEM), used to derive the irregular terrain on the bottom of the flow area grid.

HEC-RAS models do not account for infiltration or evaporation so those data are not needed. It is preferred to have data for at least two flood events for the hydraulic system of interest, one to calibrate the model and the other to validate the calibrated model. The calibration of a HEC-RAS model entails making sure the geometry and discharge, flow in and out, are correctly representing the true hydraulic system and then adjusting the Manning's "n" values, and maybe other parameters, to fine-tune the simulated water surface elevations (stage) to match observed water surface elevations (measured stage) from the event. The validation of a HEC-RAS model requires observed data for a different event. It entails running the calibrated model using discharge data from the validation event to see if the simulated water surface elevations match up to the observed water surface elevations for that event. If the stages match up, the model is validated, but if they do not, further adjustment to the model is needed. The validation proves the model is trustworthy and accurately portraying the hydraulic system of interest by producing correct results for a different flood event. The topography data are usually best representative of the hydraulic system if it consists of surveyed cross-sections. The surveyed cross-sections are preferably measured at reasonable intervals to capture the general topography and channel bathymetry. The DEM did not capture the general conveyance area because it did not have a well-defined channel.

1.8 Mannings N Value Assignment

The local manning's N values are applied during modeling for different section and mostly it varied in within the range depending upon the bed of the River reach

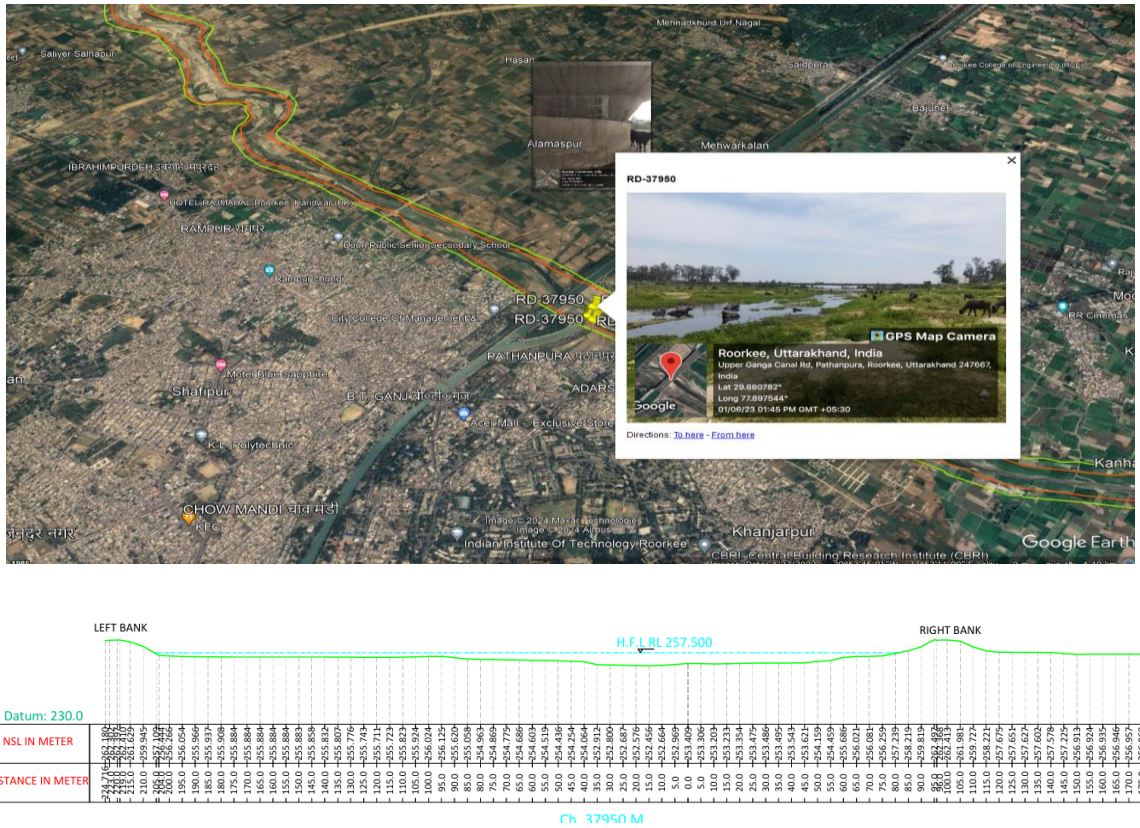
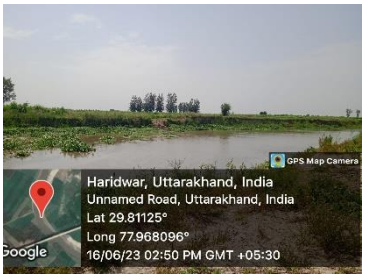
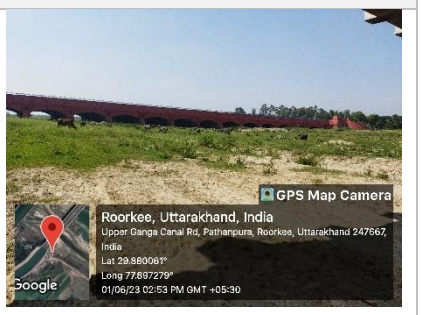


Fig. 7 Geotagged photos over the cross section for assigning the Manning's N & surveyed cross Section

Table 3: Manning's N at Different Reach

Reference	Location	River Chainage	Description	Mannings N Value	Reference Photograph
USGS, 1987 & Chow Table	Damodrabad	50	clean, straight, full stage, no rifts or deep pools	0.033	
USGS, 1987 & Chow Table	Ladpur kalan	39250	very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.1	
USGS, 1987 & Chow Table	Bhagwanpur	24200	Main Channel is clean, winding, some pools and shoals	0.040	
USGS, 1987 & Chow Table	Bhainsarhedi	43450	Cultivated Areas: mature row crops	0.035	

USGS, 1987 & Chow Table	Kanhapur, Roorkee	39350	The bed consists of sand and gravel, and has light cover of brush in some places	0.030	
USGS, 1987 & Chow Table	Roorkee, Upper Ganga Canal	38700	The bed consists of sand and gravel, and has light cover of brush in some places	0.03	

2. Geomorphic Description of the Study Reach

The study area belongs to the catchment of the river Solani a tributary of the river Ganges in and around Roorkee town between 78.03°E, 30.00°N and 77.48°E, 29.45°N. The area is relatively flat with a maximum slope of 8.85 m/km, Min, slope 0.44 m/km and average slope 2.84 m/km and is mostly comprised of sandy loam soil having 70% sand, 20% silt, and 10% clay.

Table 4: Geometric Description of Solani River

S. No.	Lot No.	Reach	Length of Reach (Km)
1	3	Solani River (Damodrabad to State Border with UP)	71

The start of the autumn season had a fairly good rainfall with relative humidity of 65 to 70%. At this time, the area was covered with mixed vegetation consisting of grassland, sugarcane, cherry, and rice. Crops were at their mature stage, which led to the variation in both surface roughness and the amount of moisture in the field. The end of the spring season had a meagre rainfall with a relative humidity of less than 50%. The beginning of the summer season had effectively no rainfall and humidity was less than 40%. The spring and summer seasons were dominated by three vegetation classes, namely, grassland, sugarcane, and wheat.

The watershed receives the rain under the influence of southwest monsoon. The northeast monsoon mainly contributes to the rainfall in the area. Most of the precipitation occurs in the monsoon season that causes flooding. The southwest monsoon rainfall is highly erratic, and Geomorphology of the study area is important for the assessment of floods because flooding is largely based on the topography. Low lying areas near to the channel are frequently flooded and such area is defined as an active floodplain. The floodplain covers channel belt and low-lying areas on either side of the river banks. Furthermore, the channel belt covers the active channel, secondary channel, chute channel and bars. Large floods often cause erosion and deposition in channel belt as well as in adjoining floodplain. Therefore, geomorphic processes (erosion or deposition) perverse footprints of large floods for many years in the virgin reaches of the river. The areas lying, between active

floodplain and valley margins are called as older floodplain which gets inundated at high magnitude floods (e.g., 100-year return period floods).

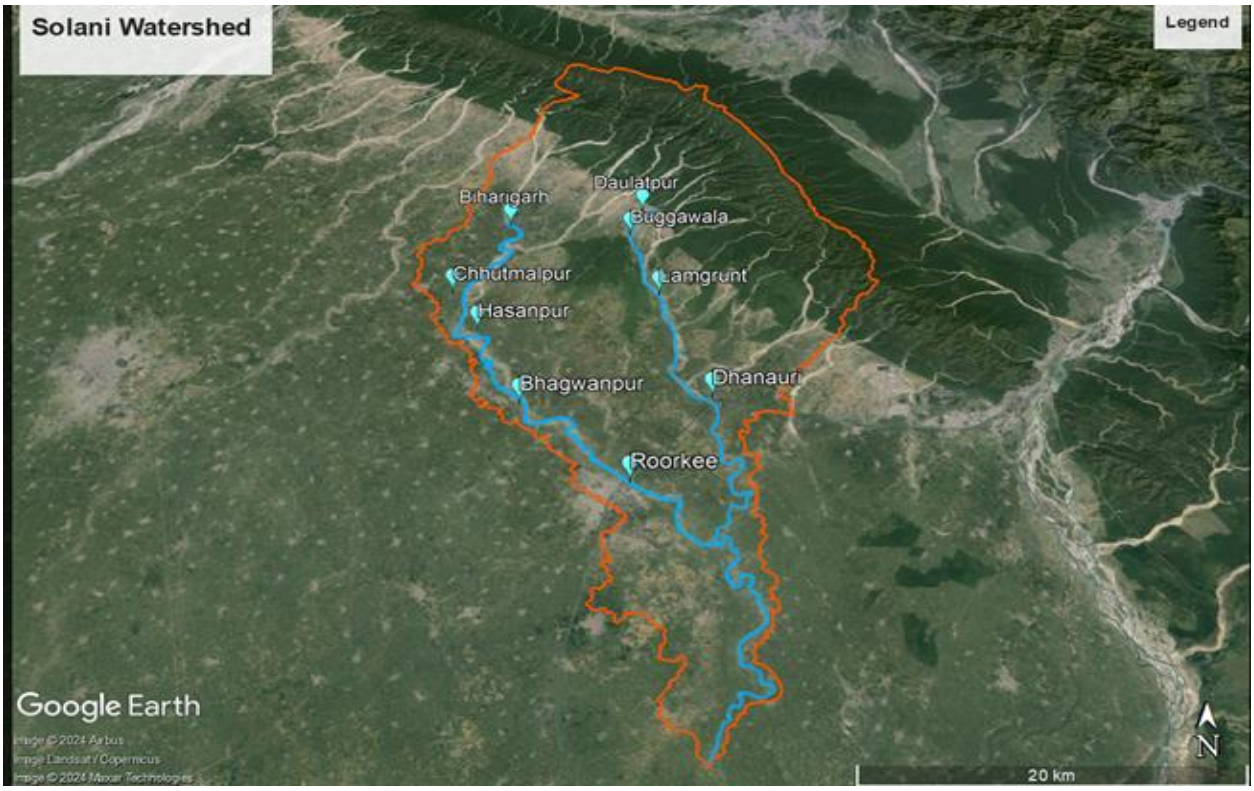


Fig. 8 Location Map of Solani Watershed

3. River Morphology

The length of Solani River is 71 km with an average slope of 2.84 m/ km. The maximum river width (~402.2 m) is found near downstream area while the minimum width (~110 m) is at 1 km at Biharigarh. The Solani River is flowing over relatively flat land with significant meandering channel. The River width is also confined with bunds at various places and also it under passed by upper ganga canal. In Roorkee town, the minimum channel width is ~80 m and the maximum width is ~410 m with a mean channel width of ~248m. Floodplain is covered by agricultural land, vegetation, and settlements. Sand, loamy and Clay deposits and floodplain materials. Such geomorphic study helped us to determine the transverse and longitudinal cross-sections for the HEC RAS modelling of the floodplain at 5, 25, 50, and 100-year return periods.

4. Input Data Base

The following data (Table 5) was procured and analyzed:

Table 5: List of input database in the present study.

S. No.	Input Data	Source	Remarks
1	Satellite Imagery	NRSC (National Remote Sensing Centre, Hyderabad)	
2	Rainfall Data	IMD (Indian Meteorological Department, Pune)	Year 1901-2016
3	Topographic Survey Sheet	SOI (Survey of India, Dehradun)	
4	Soil Map	NBSS-LUP (National Bureau of Soil Science & Land Use Planning, Nagpur)	One for Complete State
5	Annual Peak Flow & Associated Gauge Levels	Central Water Commission / Irrigation Department Uttarakhand	Peak Annual Discharges from 2019-2022
6	Hydrographic Cross-Sections	Total Station	
7	Global Control Points	DGPS (Digital Global Positioning System)	
8	Field Based Records	Interaction with Local Residents	For Recent Flood Events

5. Design Flood Estimation for Solani Watershed

Solani River

Physiographic parameters:

The physiographic parameters of the river catchment at project site have been estimated by GIS processing. The elevation along the longest flow path of the river varies from about 350m to 237m. The estimated parameters of the river catchment at project site are given in Table.

Table 6 Physiographic parameters of Solani catchment

Catchment Area (km^2)	L (km)	Lc (km)	Equivalent stream slope (m/km)
1001	71.45	25	7.30

Assessment of Unit Hydrograph

In absence of short interval observed discharge and concurrent rainfall data; the unit hydrograph of one-hour duration has been derived using Flood Estimation Report for Western Himalaya Zone-7 The estimated UH parameters are given at Table-2. The unit hydrograph ordinates as assessed for the unit hydrograph of catchment are given at Table-4.

Table 7: Unit Hydrograph Parameters:

Parameter	Unit	Value
Time from the centre of effective rainfall duration to the UH peak tp = $2.498*(L*Lc/S)^{0.156}$	hr	5.89
Peak discharge of unit hydrograph per unit area qp = $1.048*(tp)^{-0.178}$	m 3 /sec/sq. km	0.76
Width of the UH measured at 50% of peak discharge ordinate W50 = $1.954*(L*Lc/S)^{0.099}$	hr	3.37
Width of the UH measured at 75% of peak discharge ordinate W75 = $0.972*(L*Lc/S)^{0.124}$	hr	1.92
Width of the rising limb of UH measured at 50% of peak discharge ordinate WR50 = $0.189(W50)^{1.769}$	hr	1.62
Width of the rising limb of UH measured at 75% of peak discharge ordinate WR75 = $0.419(W75)^{1.246}$	hr	0.95
Base width of UH TB = $7.845*(tp)^{0.453}$	hr	17.52
Peak Discharge of UH Qp = qp x A	m 3 /sec	721.50
Unit duration of unit hydrograph tr	hr	1
Time from the start of rise to the peak of the UH Tm=tp+tr /2	hr	6.39
Q theoretical = A*d/0.36*tr here d= 1 cm depth and tr = 1 hr	m 3 /sec	2622.22

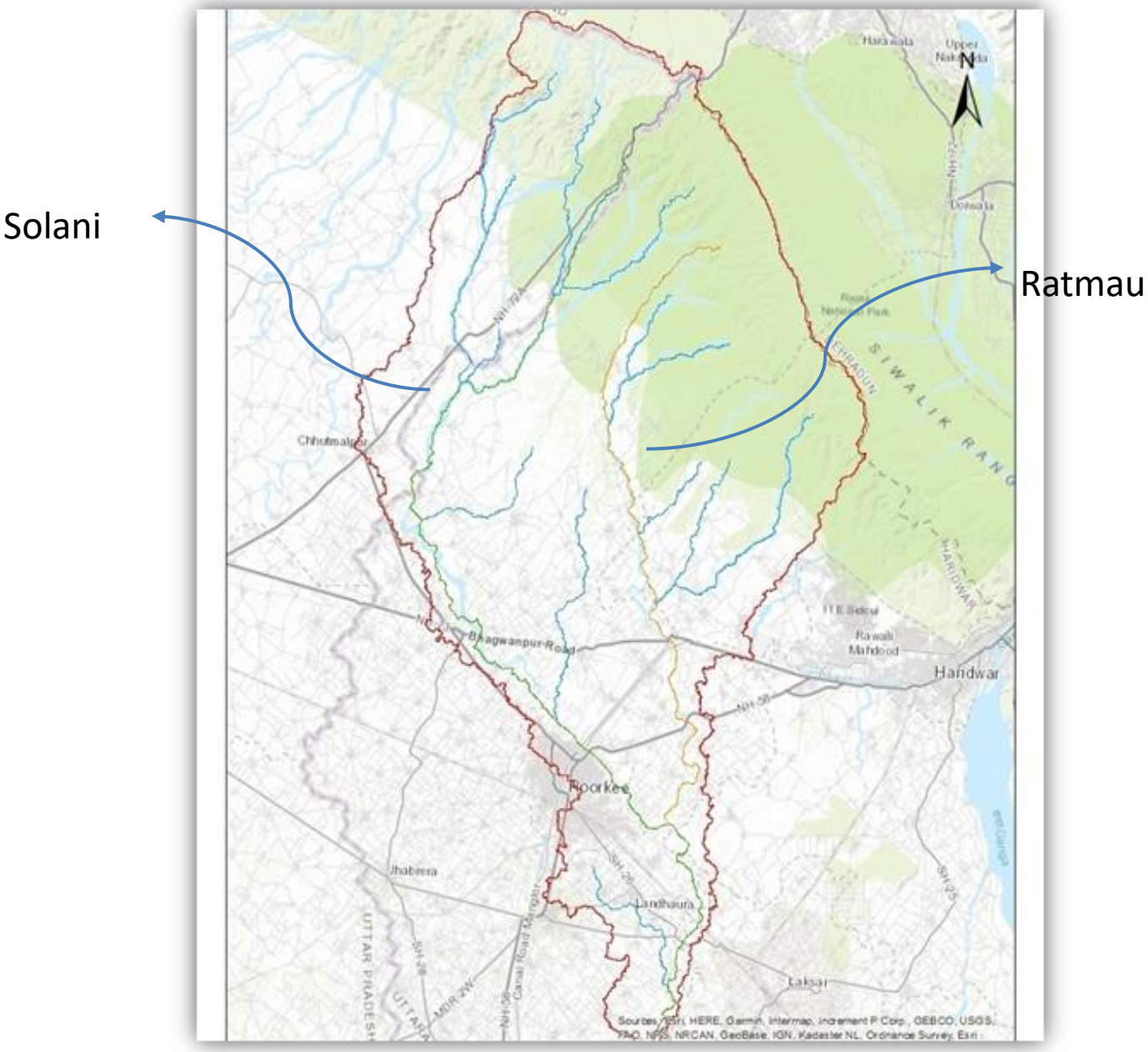


Fig. 9. Map of Solani watershed

Table 8: Rainfall for Different Return Period

By obtaining the rain gauge station from PMP atlas, Thiessen polygon is prepared and weighted average rainfall is derived for basin of different return period as mentioned in the table given below.

Return Period	5	10	25	50	100
Rainfall (mm)	135.00	165.32	202.63	230.95	259.10
Rainfall (cm)	13.50	16.53	20.26	23.09	25.91

Table 9: Unit Hydrograph Ordinates

After deriving the peak and ordinates at 50% and 75% of the peak, UH for 1 hr unit depth is traced at graph paper then hydrograph is smoothened as mentioned below in the Table.

Unit Hydrograph	
T	Q
0	0
1	13
2	36
3	56
4	90
5	137
6	214
7	337
8	721
9	313
10	182
11	142
12	109
13	85
14	66
15	45
16	33
17	23
18	9
19	6

Fig. 6 1Hr UH for Solani Watershed

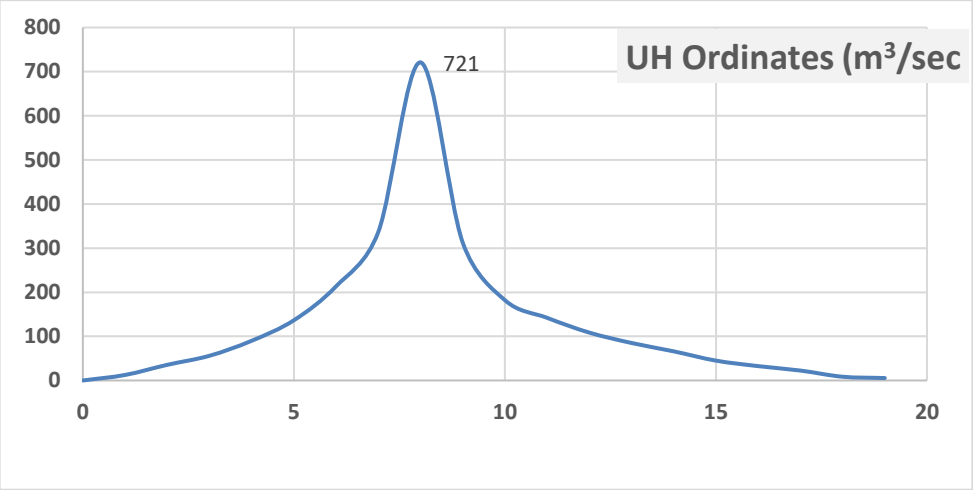


Fig.- 10: Synthetic Unit Hydrograph for Solani River

A. 100 Year Return Period Flood Estimation

A design loss rate of 0 to 0 .6 cm /hr as recommended in CWC FER of Western Himalayan Zone-7 report for has been adopted for design flood computation.

As recommended by CWC Western Himalayan Zone-7 report following base flow rate has been adopted:

Base flow / km2 of drainage area = 0.10 (max)

Using the above formula, the computed base flow for the catchment area is 0.61 m^3 /sec.

Time Distribution of Rainfall:

For hourly distribution of rainfall, normalized distribution coefficient has been worked out for bell of 12 hour each using the hourly distribution coefficient of 24-hour rainfall from PMP Atlas of Ganga River Basins.

The hourly distribution coefficient of 24-hour rainfall and normalized distribution coefficient for 12-hour bell are given in **Table 10: Distribution Coefficient**

Time	Distribution coefficient for 24 hour rainfall (%)	Normalised Distribution coefficient for 12 hour bell
1	0.17	0.202
2	0.27	0.341
3	0.36	0.452
4	0.43	0.544
5	0.48	0.631
6	0.53	0.7
7	0.58	0.768
8	0.63	0.831
9	0.66	0.882
10	0.7	0.928
11	0.73	0.971
12	0.76	1
13	0.79	
14	0.82	
15	0.84	
16	0.86	
17	0.88	
18	0.9	
19	0.92	
20	0.94	
21	0.96	
22	0.98	
23	0.99	
24	1	

Table 11: RP rainfall depth for 12-hour bells

After getting rainfall distribution for 24 hrs, rainfall is further distributed in the sets of 12hr based on the previous table.

Catchment	100yr RP Rainfall	24 hr Max (1.15* col(1)	1st Bell 76% of col. (1) B1	2nd Bell 24% of col. (1) B2
	1	2	3	4
Solani	134.70	154.90	102.37	32.33

Table 12: 12 Hour bell distribution of rainfall

Two bells on based on its fraction are prepared i.e. 1st 12hr Bell & 2nd 12hr Bell.

Bell	Rainfall PMP Depth
1st 12Hr Bell	102.4
2nd 12Hr Bell	32.3

Table 13: Hourly Distribution of Rainfall

After preparing 12hr bells, cumulative rainfall depth, incremental rainfall depth & effective rainfall are calculated by subtracting the losses.

Time	Dis. Coeff.	Nor. Dis. Coeff.	Cumulative Rainfall Depth		Incremental Rainfall Depth			Effective Rainfall Depth	
			1st 12 hr Bell Distribution	2nd 12 Hr Bell Distribution	Incremental Rainfall 1st Bell	Incremental Rainfall 2nd Bell	Loss	Eff. Inc. Rainfall Depth 1st Bell	Eff. Inc. Rainfall Depth 2nd Bell
Hr	%	%	(mm)	(mm)	(mm)	(mm)	mm/hr	(mm)	(mm)
1	0.17	0.202	22.90	6.53	22.90	6.53	0.6	22.30	5.93
2	0.27	0.341	36.37	11.02	13.47	4.49	0.6	12.87	3.89
3	0.36	0.452	48.49	14.61	12.12	3.59	0.6	11.52	2.99
4	0.43	0.544	57.92	17.59	9.43	2.97	0.6	8.83	2.37
5	0.48	0.631	64.66	20.40	6.73	2.81	0.6	6.13	2.21
6	0.53	0.7	71.39	22.63	6.73	2.23	0.6	6.13	1.63
7	0.58	0.768	78.12	24.83	6.73	2.20	0.6	6.13	1.60
8	0.63	0.831	84.86	26.86	6.73	2.04	0.6	6.13	1.44
9	0.66	0.882	88.90	28.51	4.04	1.65	0.6	3.44	1.05
10	0.7	0.928	94.29	30.00	5.39	1.49	0.6	4.79	0.89
11	0.73	0.971	98.33	31.39	4.04	1.39	0.6	3.44	0.79
12	0.76	1	102.37	32.33	4.04	0.94	0.6	3.44	0.34

Table 14: Critical sequencing for Effective hourly rainfall

After getting the effective rainfall depth, for both bell, critical sequencing and reverse critical sequencing is done for rainfall & corresponding to its UH ordinates. Then rain convolution for both the bell are obtained, which is further to be used for designing the flood hydrograph for different return period floods.

Time	UH ordinate	Critical Sequence of Hourly Rainfall Depth		Reverse Critical Sequence		Conv. Rainfall B2-B1
		1st 12 Hr bell	2nd 12 Hr bell	1st 12 Hr bell	2nd 12 Hr bell	
Hr	cumec	(mm)	(mm)	(mm)	(mm)	(mm)
0	0					
1	16					3.4
2	36					4.8
3	62	3.4	0.3			6.1
4	95	3.4	1.0			6.1
5	146	6.1	1.6	3.4	0.8	6.1
6	230	8.8	2.4	4.8	0.9	11.5
7	360	12.9	3.9	6.1	1.4	22.3
8	722	22.3	5.9	6.1	1.6	12.9
9	335	11.5	3.0	6.1	2.2	8.8
10	195	6.1	2.2	11.5	3.0	6.1
11	153	6.1	1.6	22.3	5.9	3.4
12	120	6.1	1.4	12.9	3.9	3.4
13	93	4.8	0.9	8.8	2.4	0.8
14	72	3.4	0.8	6.1	1.6	0.9
15	54			3.4	1.0	1.4
16	41			3.4	0.3	1.6
17	26					2.2
18	15					3.0
19	7					5.9
20	0					3.9
21						2.4
22						1.6
23						1.0
24						0.3

Design Flood Estimation By using convoluted rainfall and UH ordinate, design flood is derived for specific return period.

Table 15: 100yr Return Period flood for Solani River

Time	UH ord.	Rainfall Excess (cm)																						DRH	Base Flow	100yr
hr	cumec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	cumec	cumec	Return
		0.34	0.48	0.61	0.61	0.61	1.15	2.23	1.29	0.88	0.61	0.34	0.34	0.08	0.09	0.14	0.16	0.22	0.30	0.59	0.39	0.24	0.16	0.10	0.03			Period
0	0.0	0.0																								0.0	1	1.0
1	12.5	4.3	0.0																							4.3	1	5.3
2	35.5	12.2	6.0	0.0																						18.2	1	19.2
3	56.0	19.3	17.0	7.7	0.0																					43.9	1	44.9
4	90.0	31.0	26.8	21.8	7.7	0.0																				87.2	1	88.2
5	136.5	47.0	43.1	34.4	21.8	7.7	0.0																			153.9	1	154.9
6	213.5	73.5	65.4	55.2	34.4	21.8	14.4	0.0																		264.6	1	265.6
7	336.5	115.8	102.2	83.7	55.2	34.4	40.9	27.9	0.0																	460.1	1	461.1
8	721.0	248.1	161.1	131.0	83.7	55.2	64.5	79.2	16.1	0.0																838.9	1	839.9
9	312.5	107.5	345.2	206.4	131.0	83.7	103.7	124.9	45.7	11.0	0.0															1159.2	1	1160.2
10	182.0	62.6	149.6	442.3	206.4	131.0	157.3	200.7	72.1	31.3	7.7	0.0														1461.0	1	1462.0
11	142.0	48.9	87.1	191.7	442.3	206.4	246.0	304.4	115.8	49.4	21.8	4.3	0.0													1718.2	1	1719.2
12	108.5	37.3	68.0	111.7	191.7	442.3	387.7	476.1	175.7	79.5	34.4	12.2	4.3	0.0												2020.8	1	2021.8
13	85.0	29.2	51.9	87.1	111.7	191.7	830.8	750.3	274.8	120.5	55.2	19.3	12.2	1.0	0.0											2535.8	1	2536.8
14	66.0	22.7	40.7	66.6	87.1	111.7	360.1	1607.7	433.1	188.5	83.7	31.0	19.3	2.8	1.1	0.0										3056.0	1	3057.0
15	45.0	15.5	31.6	52.1	66.6	87.1	209.7	696.8	927.9	297.1	131.0	47.0	31.0	4.4	3.1	1.8	0.0									2602.7	1	2603.7
16	32.5	11.2	21.5	40.5	52.1	66.6	163.6	405.8	402.2	636.6	206.4	73.5	47.0	7.1	5.0	5.1	2.0	0.0								2146.2	1	2147.2
17	22.5	7.7	15.6	27.6	40.5	52.1	125.0	316.6	234.2	275.9	442.3	115.8	73.5	10.8	8.0	8.0	5.8	2.8	0.0							1762.3	1	1763.3
18	8.5	2.9	10.8	19.9	27.6	40.5	97.9	241.9	182.8	160.7	191.7	248.1	115.8	16.9	12.1	12.9	9.1	7.9	3.7	0.0						1403.3	1	1404.3
19	5.5	1.9	4.1	13.8	19.9	27.6	76.1	189.5	139.6	125.4	111.7	107.5	248.1	26.6	18.9	19.6	14.7	12.4	10.6	7.4	0.0					1175.4	1	1176.4
20	0.0	0.0	2.6	5.2	13.8	19.9	51.9	147.2	109.4	95.8	87.1	62.6	107.5	57.0	29.8	30.7	22.3	19.9	16.7	21.1	4.9	0.0				905.4	1	906.4
21			0.0	3.4	5.2	13.8	37.4	100.3	84.9	75.0	66.6	48.9	62.6	24.7	64.0	48.3	34.8	30.2	26.9	33.2	13.8	3.0	0.0			777.1	1	778.1
22				0.0	3.4	5.2	25.9	72.5	57.9	58.3	52.1	37.3	48.9	14.4	27.7	103.6	54.9	47.2	40.8	53.4	21.8	8.4	2.0	0.0		735.7	1	736.7
23					0.0	3.4	9.8	50.2	41.8	39.7	40.5	29.2	37.3	11.2	16.1	44.9	117.6	74.5	63.8	80.9	35.0	13.3	5.7	1.3	0.0	716.3	1	717.3
24						0.0	6.3	19.0	29.0	28.7	27.6	22.7	29.2	8.6	12.6	26.1	51.0	159.5	100.6	126.6	53.1	21.4	9.0	3.7	0.4	734.7	1	735.7
25							0.0	12.3	10.9	19.9	19.9	15.5	22.7	6.7	9.6	20.4	29.7	69.1	215.5	199.5	83.1	32.4	14.4	5.9	1.2	787.6	1	788.6
26								0.0	7.1	7.5	13.8	11.2	15.5	5.2	7.5	15.6	23.2	40.3	93.4	427.6	131.0	50.7	21.8	9.4	1.9	880.7	1	881.7
27									0.0	4.9	5.2	7.7	11.2	3.6	5.9	12.2	17.7	31.4	54.4	185.3	280.7	79.9	34.1	14.3	3.0	748.5	1	749.5
28										0.0	3.4	2.9	7.7	2.6	4.0	9.5	13.9	24.0	42.4	107.9	121.7	171.2	53.8	22.4	4.6	587.3	1	588.3
29											0.0	1.9	2.9	1.8	2.9	6.5	10.8	18.8	32.4	84.2	70.9	74.2	115.2	35.3	7.2	457.7	1	458.7
30												0.0	1.9	0.7	2.0	4.7	7.3	14.6	25.4	64.3	55.3	43.2	49.9	75.6	11.4	345.0	1	346.0
31													0.0	0.4	0.8	3.2	5.3	10.0	19.7	50.4	42.2	33.7	29.1	32.8	24.3	227.6	1	228.6
32														0.0	0.5	1.2	3.7	7.2	13.4	39.1	33.1	25.8	22.7	19.1	10.5	165.8	1	166.8
33															0.0	0.8	1.4	5.0	9.7	26.7	25.7	20.2	17.3	14.9	6.1	121.7	1	122.7
34																0.0	0.9	1.9	6.7	19.3	17.5	15.7	13.6	11.4	4.8	86.9	1	87.9
35																	0.0	1.2	2.5	13.3	12.7	10.7	10.5	8.9	3.7	59.9	1	60.9
36																		0.0	1.6	5.0	8.8	7.7	7.2	6.9	2.9	37.3	1	38.3
37																			0.0	3.3	3.3	5.3	5.2	4.7	2.2	21.8	1	22.8
38																				0.0	2.1	2.0	3.6	3.4	1.5	11.2	1	12.2
39																					0.0	1.3	1.4	2.4	1.1	5.0	1	6.0
40																						0.0	0.9	0.9	0.8	1.8	1	2.8
41																							0.0	0.6	0.3	0.6	1	1.6
42																								0	0.2	0.0	1	1.0
43																									0.0	0.0	1	1.0

Design Flood Hydrograph:

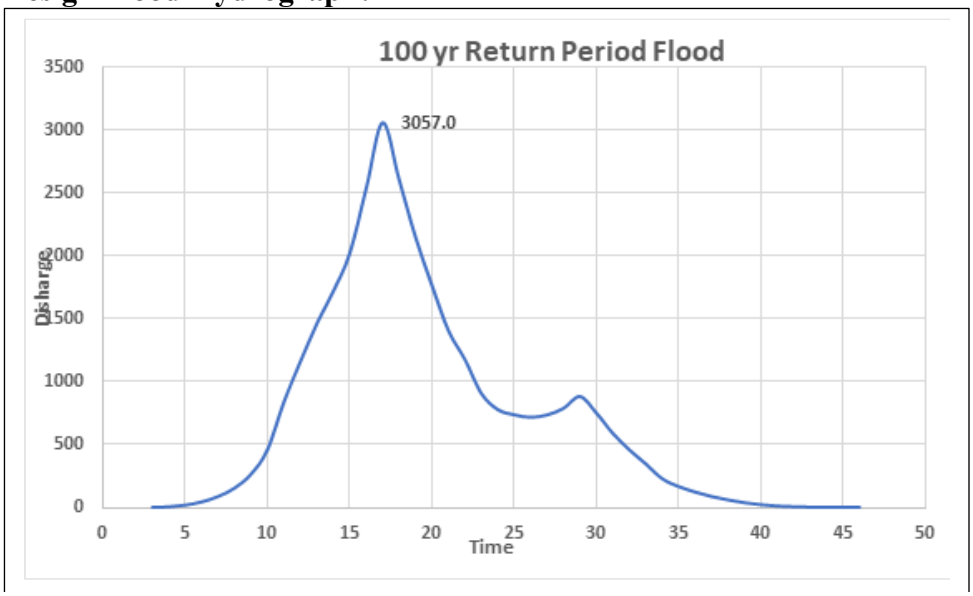


Fig.11: Design Flood Hydrograph for 100yr Return Period

Table 16: 100 yr Design Flood Hydrograph for Solani River:

Time (hr)	Design Flood Ordinates (cumec)	Time (hr)	Design Flood Ordinates (cumec)
0	1	22	737
1	5	23	717
2	19	24	736
3	45	25	789
4	88	26	882
5	155	27	749
6	266	28	588
7	461	29	459
8	840	30	346
9	1160	31	229
10	1462	32	167
11	1719	33	123
12	2022	34	88
13	2537	35	61
14	**3057**	36	38
15	2604	37	23
16	2147	38	12
17	1763	39	6
18	1404	40	3
19	1176	41	2
20	906	42	1
21	778	43	1

50 Year Return Period Flood Estimation

A design loss rate of 0 to 0 .6 cm /hr as recommended in CWC FER of Western Himalayan Zone-7 report for has been adopted for design flood computation.

As recommended by CWC Western Himalayan Zone-7 report following base flow rate has been adopted:

Base flow / km2 of drainage area = 0.10 (max)

Using the above formula, the computed base flow for the catchment area is 0.61.0 m^3 /sec.

Time Distribution of Rainfall:

For hourly distribution of rainfall, normalized distribution coefficient has been worked out for bell of 12 hour each using the hourly distribution coefficient of 24-hour rainfall from PMP Atlas of Ganga River Basins. The hourly distribution coefficient of 24-hour rainfall and normalized distribution coefficient for 12-hour bell are given in previously mentioned table no. 8

Table 17: PMP depth for 12-hour bells

After getting rainfall distribution for 24 hrs, rainfall is further bifurcated in the sets of 12hr based on the previous table.

Catchment	100yr RP Rainfall	24 hr Max (1.15* col(1)	1st Bell 76% of col. (1) B1	2nd Bell 24 % of col. (1) B2
	1	2	3	4
Solani	120.19	138.22	91.34	28.85

Table 18: 12 Hour bell distribution of rainfall

Two bells on based on its fraction are prepared i.e. 1st 12hr Bell & 2nd 12hr Bell.

Bell	Rainfall PMP Depth
1st 12Hr Bell	91.3
2nd 12Hr Bell	28.8

Table 19: Hourly Distribution of Rainfall

After preparing 12hr bells, cumulative rainfall depth, incremental rainfall depth & effective rainfall are calculated by subtracting the losses.

Time	Dis. Coeff.	Nor. Dis. Coeff.	Cumulative Rainfall Depth		Incremental Rainfall Depth		Loss	Effective Rainfall Depth	
			1st 12 hr Bell Distribution	2nd 12 Hr Bell Distribution	Incremental Rainfall 1st Bell	Incremental Rainfall 2nd Bell		Eff. Inc. Rainfall Depth 1st Bell	Eff. Inc. Rainfall Depth 2nd Bell
Hr	%	%	(mm)	(mm)	(mm)	(mm)	mm/hr	(mm)	(mm)
1	0.17	0.202	20.43	5.83	20.43	5.83	0.6	19.83	5.23
2	0.27	0.341	32.45	9.84	12.02	4.01	0.6	11.42	3.41
3	0.36	0.452	43.27	13.04	10.82	3.20	0.6	10.22	2.60
4	0.43	0.544	51.68	15.69	8.41	2.65	0.6	7.81	2.05
5	0.48	0.631	57.69	18.20	6.01	2.51	0.6	5.41	1.91
6	0.53	0.7	63.70	20.19	6.01	1.99	0.6	5.41	1.39
7	0.58	0.768	69.71	22.15	6.01	1.96	0.6	5.41	1.36
8	0.63	0.831	75.72	23.97	6.01	1.82	0.6	5.41	1.22
9	0.67	0.882	80.53	25.44	4.81	1.47	0.6	4.21	0.87
10	0.7	0.928	84.13	26.77	3.61	1.33	0.6	3.01	0.73
11	0.73	0.971	87.74	28.01	3.61	1.24	0.6	3.01	0.64
12	0.76	1	91.34	28.85	3.61	0.84	0.6	3.01	0.24

Table 20: Critical sequencing for Effective hourly rainfall

After getting the effective rainfall depth, for both bell, critical sequencing and reverse critical sequencing is done for rainfall & corresponding to its UH ordinates. Then rain convolution for both the bell are obtained, which is further to be used for designing the flood hydrograph for different return period floods

Time	UH ordinate	Critical Sequence of Hourly Rainfall Depth		Reverse Critical Sequence		Conv. Rainfall B2-B1
		1st 12 Hr bell	2nd 12 Hr bell	1st 12 Hr bell	2nd 12 Hr bell	
Hr	cumec	(mm)	(mm)	(mm)	(mm)	(mm)
0	0					
1	16					3.0
2	36					3.0
3	62	3.0	0.2			5.4
4	95	4.2	0.9			5.4
5	146	5.4	1.4	3.0	0.6	5.4
6	230	7.8	2.1	3.0	0.7	10.2
7	360	11.4	3.4	5.4	1.2	19.8
8	722	19.8	5.2	5.4	1.4	11.4
9	335	10.2	2.6	5.4	1.9	7.8
10	195	5.4	1.9	10.2	2.6	5.4
11	153	5.4	1.4	19.8	5.2	4.2
12	120	5.4	1.2	11.4	3.4	3.0
13	93	3.0	0.7	7.8	2.1	0.6
14	72	3.0	0.6	5.4	1.4	0.7
15	54			4.2	0.9	1.2
16	41			3.0	0.2	1.4
17	26					1.9
18	15					2.6
19	7					5.2
20	0					3.4
21						2.1
22						1.4
23						0.9
24						0.2

Table 21: 50yr Return Period flood for Solani River:

Time	UH ord.	Rainfall Excess (cm)																							DRH	Base Flow	100yr
hr	cumec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	cumec	cumec	Return
		0.30	0.30	0.54	0.54	0.54	1.02	1.98	1.14	0.78	0.54	0.42	0.30	0.06	0.07	0.12	0.14	0.19	0.26	0.52	0.34	0.21	0.14	0.09	0.02			Period
0	0.0	0.0																								0.0	1	1.0
1	15.8	4.7	0.0																							4.7	1	5.7
2	36.2	10.9	4.7	0.0																						15.6	1	16.6
3	61.8	18.6	10.9	8.5	0.0																					38.0	1	39.0
4	95.1	28.6	18.6	19.6	8.5	0.0																				75.3	1	76.3
5	145.9	43.8	28.6	33.5	19.6	8.5	0.0																			134.0	1	135.0
6	230.0	69.1	43.8	51.4	33.5	19.6	16.1	0.0																		233.5	1	234.5
7	360.0	108.2	69.1	78.9	51.4	33.5	37.0	31.2	0.0																	409.3	1	410.3
8	722.0	217.0	108.2	124.4	78.9	51.4	63.2	71.7	18.0	0.0																732.9	1	733.9
9	335.5	100.8	217.0	194.7	124.4	78.9	97.2	122.6	41.3	12.3	0.0															989.3	1	990.3
10	195.4	58.7	100.8	390.6	194.7	124.4	149.0	188.6	70.6	28.3	8.5	0.0														1314.3	1	1315.3
11	153.0	46.0	58.7	181.5	390.6	194.7	235.0	289.3	108.6	48.3	19.6	6.6	0.0													1578.8	1	1579.8
12	119.6	35.9	46.0	105.7	181.5	390.6	367.8	456.1	166.5	74.3	33.5	15.2	4.7	0.0												1877.9	1	1878.9
13	93.3	28.1	35.9	82.8	105.7	181.5	737.7	714.0	262.6	114.0	51.4	26.0	10.9	1.0	0.0											2351.5	1	2352.5
14	72.3	21.7	28.1	64.7	82.8	105.7	342.7	1431.9	411.1	179.7	78.9	40.0	18.6	2.3	1.1	0.0										2809.3	1	2810.3
15	54.3	16.3	21.7	50.5	64.7	82.8	199.7	665.3	824.4	281.3	124.4	61.4	28.6	4.0	2.6	1.9	0.0									2429.6	1	2430.6
16	40.8	12.3	16.3	39.1	50.5	64.7	156.3	387.6	383.1	564.1	194.7	96.8	43.8	6.1	4.5	4.4	2.2	0.0								2026.5	1	2027.5
17	26.3	7.9	12.3	29.4	39.1	50.5	122.2	303.4	223.2	262.1	390.6	151.5	69.1	9.3	6.9	7.5	5.0	3.0	0.0							1693.0	1	1694.0
18	14.6	4.4	7.9	22.1	29.4	39.1	95.4	237.2	174.7	152.7	181.5	303.8	108.2	14.7	10.6	11.6	8.6	6.9	4.1	0.0						1412.8	1	1413.8
19	7.0	2.1	4.4	14.2	22.1	29.4	73.9	185.1	136.6	119.5	105.7	141.1	217.0	23.1	16.7	17.8	13.2	11.8	9.4	8.2	0.0					1149.3	1	1150.3
20	0.0	0.0	2.1	7.9	14.2	22.1	55.4	143.5	106.6	93.4	82.8	82.2	100.8	46.2	26.2	28.0	20.3	18.2	16.1	18.9	5.4	0.0				888.2	1	889.2
21			0.0	3.8	7.9	14.2	41.7	107.6	82.6	72.9	64.7	64.4	58.7	21.5	52.5	43.8	32.0	27.9	24.7	32.3	12.3	3.2	0.0			765.0	1	766.0
22				0.0	3.8	7.9	26.8	81.0	62.0	56.5	50.5	50.3	46.0	12.5	24.4	87.9	50.1	43.9	37.9	49.7	21.1	7.4	2.1	0.0		718.1	1	719.1
23					0.0	3.8	14.9	52.1	46.6	42.4	39.1	39.3	35.9	9.8	14.2	40.8	100.4	68.7	59.8	76.2	32.4	12.7	4.9	1.4	0.0	691.8	1	692.8
24						0.0	7.2	28.9	30.0	31.9	29.4	30.4	28.1	7.7	11.1	23.8	46.6	137.9	93.7	120.2	49.7	19.5	8.4	3.2	0.4	700.8	1	701.8
25							0.0	13.9	16.7	20.5	22.1	22.8	21.7	6.0	8.7	18.6	27.2	64.1	187.9	188.2	78.4	30.0	12.9	5.4	0.9	731.9	1	732.9
26								0.0	8.0	11.4	14.2	17.2	16.3	4.6	6.8	14.6	21.3	37.3	87.3	377.4	122.7	47.2	19.9	8.3	1.5	807.9	1	808.9
27									0.0	5.5	7.9	11.0	12.3	3.5	5.3	11.4	16.6	29.2	50.9	175.3	246.2	73.9	31.3	12.7	2.2	689.7	1	690.7
28										0.0	3.8	6.1	7.9	2.6	3.9	8.8	13.0	22.8	39.8	102.2	114.4	148.3	49.0	20.0	3.4	542.3	1	543.3
29											0.0	2.9	4.4	1.7	3.0	6.6	10.1	17.8	31.1	80.0	66.6	68.9	98.3	31.4	5.4	425.2	1	426.2
30												0.0	2.1	0.9	1.9	5.0	7.5	13.8	24.3	62.5	52.2	40.1	45.7	62.9	8.5	325.4	1	326.4
31													0.0	0.4	1.1	3.2	5.7	10.4	18.8	48.8	40.8	31.4	26.6	29.2	17.1	233.0	1	234.0
32														0.0	0.5	1.8	3.7	7.8	14.1	37.8	31.8	24.6	20.8	17.0	7.9	167.3	1	168.3
33															0.0	0.9	2.0	5.0	10.6	28.4	24.7	19.2	16.3	13.3	4.6	124.1	1	125.1
34																0.0	1.0	2.8	6.8	21.3	18.5	14.9	12.7	10.4	3.6	91.1	1	92.1
35																	0.0	1.3	3.8	13.7	13.9	11.1	9.8	8.1	2.8	63.4	1	64.4
36																		0.0	1.8	7.6	9.0	8.4	7.4	6.3	2.2	40.9	1	41.9
37																			0.0	3.7	5.0	5.4	5.6	4.7	1.7	22.4	1	23.4
38																				0.0	2.4	3.0	3.6	3.6	1.3	11.4	1	12.4
39																					0.0	1.4	2.0	2.3	1.0	5.2	1	6.2
40																						0.0	1.0	1.3	0.6	1.9	1	2.9
41																							0.0	0.6	0.3	0.3	1	1.3
42																								0	0.2	0.2	1	1.2
43																									0.0	0.0	1	1.0

Design Flood Hydrograph

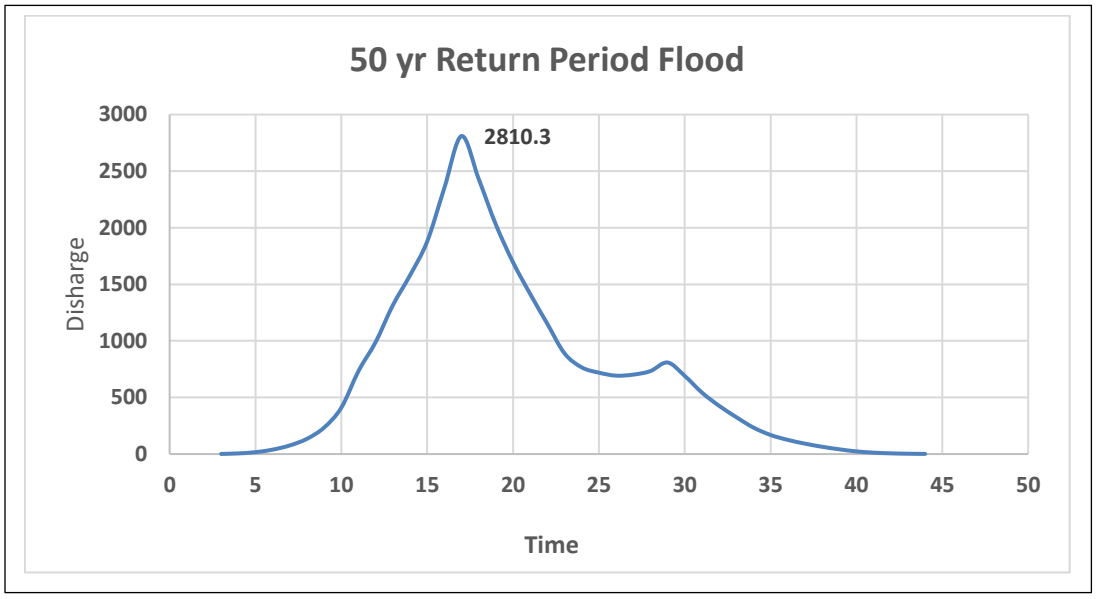


Fig.12: Design Flood Hydrograph for 50yr Return Period

Table 22: 50 yr Design Flood Hydrograph for Solani River

Time (hr)	Design Flood Ordinates (cumec)	Time (hr)	Design Flood Ordinates (cumec)
0	1	22	719
1	6	23	693
2	17	24	702
3	39	25	733
4	76	26	809
5	135	27	691
6	235	28	543
7	410	29	426
8	734	30	326
9	990	31	234
10	1315	32	168
11	1580	33	125
12	1879	34	92
13	2353	35	64
14	**2810**	36	42
15	2431	37	23
16	2028	38	12
17	1694	39	6
18	1414	40	3
19	1150	41	1
20	889	42	1
21	766	43	1

C. 25 Year Return Period Flood Estimation

A design loss rate of 0 to 0 .6 cm /hr as recommended in CWC FER of Western Himalayan Zone-7 report for has been adopted for design flood computation.

As recommended by CWC Western Himalayan Zone-7 report following base flow rate has been adopted:

Base flow / km2 of drainage area = 0.10 (max)

Using the above formula, the computed base flow for the catchment area is 0.61.0 m^3 /sec.

Time Distribution of Rainfall:

For hourly distribution of rainfall, normalized distribution coefficient has been worked out for bell of 12 hour each using the hourly distribution coefficient of 24-hour rainfall from PMP Atlas of Ganga River Basins. The hourly distribution coefficient of 24-hour rainfall and normalized distribution coefficient for 12-hour bell are mentioned in table no.8.

After getting rainfall distribution for 24 hrs, rainfall is further bifurcated in the sets of 12hr based on the previous table.

Table 23: RP rainfall depth for 12-hour bells

Catchment	RP Rainfall	24 hr Max (1.15* col(1)	1st Bell 76% of col. (1) B1	2nd Bell 24 % of col. (1) B2
	1	2	3	4
Solani	105.45	121.27	80.14	25.31

Two bells on based on its fraction are prepared i.e. 1st 12hr Bell & 2nd 12hr Bell.

Table 24: 12 Hour bell distribution of rainfall

Bell	Rainfall PMP Depth
1st 12Hr Bell	80.1
2nd 12Hr Bell	25.3

After preparing 12hr bells, cumulative rainfall depth, incremental rainfall depth & effective rainfall are calculated by subtracting the losses.

Table 25: Hourly Distribution of Rainfall

Time	Dis. Coeff.	Nor. Dis. Coeff.	Cumulative Rainfall Depth		Incremental Rainfall Depth		Loss	Effective Rainfall Depth	
			1st 12 hr Bell Distribution	2nd 12 Hr Bell Distribution	Incremental Rainfall 1st Bell	Incremental Rainfall 2nd Bell		Eff. Inc. Rainfall Depth 1st Bell	Eff. Inc. Rainfall Depth 2nd Bell
Hr	%	%	(mm)	(mm)	(mm)	(mm)	mm/ hr	(mm)	(mm)
1	0.17	0.202	17.93	5.11	17.93	5.11	0.6	17.33	4.51
2	0.27	0.341	28.47	8.63	10.55	3.52	0.6	9.95	2.92
3	0.36	0.452	37.96	11.44	9.49	2.81	0.6	8.89	2.21
4	0.43	0.544	45.34	13.77	7.38	2.33	0.6	6.78	1.73
5	0.48	0.631	50.62	15.97	5.27	2.20	0.6	4.67	1.60
6	0.53	0.7	55.89	17.72	5.27	1.75	0.6	4.67	1.15
7	0.58	0.768	61.16	19.44	5.27	1.72	0.6	4.67	1.12
8	0.63	0.831	66.44	21.03	5.27	1.59	0.6	4.67	0.99
9	0.67	0.882	70.65	22.32	4.22	1.29	0.6	3.62	0.69
10	0.7	0.928	73.82	23.49	3.16	1.16	0.6	2.56	0.56
11	0.73	0.971	76.98	24.57	3.16	1.09	0.6	2.56	0.49
12	0.76	1	80.14	25.31	3.16	0.73	0.6	2.56	0.13

After getting the effective rainfall depth, for both bell, critical sequencing and reverse critical sequencing (Table 21) is done for rainfall & corresponding to its UH ordinates. Then rain convolution for both the bell are obtained, which is further to be used for designing the flood hydrograph for different return period floods.

Table 26: Critical sequencing for Effective hourly rainfall

Time	UH ordinate	Critical Sequence of Hourly Rainfall Depth		Reverse Critical Sequence		Conv. Rainfall B2-B1
		1st 12 Hr bell	2nd 12 Hr bell	1st 12 Hr bell	2nd 12 Hr bell	
Hr	cumec	(mm)	(mm)	(mm)	(mm)	(mm)
0	0					
1	16					2.6
2	36					2.6
3	62	2.6	0.1			4.7
4	95	3.6	0.7			4.7
5	146	4.7	1.1	2.6	0.5	4.7
6	230	6.8	1.7	2.6	0.6	8.9
7	360	9.9	2.9	4.7	1.0	17.3
8	722	17.3	4.5	4.7	1.1	9.9
9	335	8.9	2.2	4.7	1.6	6.8
10	195	4.7	1.6	8.9	2.2	4.7
11	153	4.7	1.1	17.3	4.5	3.6
12	120	4.7	1.0	9.9	2.9	2.6
13	93	2.6	0.6	6.8	1.7	0.5
14	72	2.6	0.5	4.7	1.1	0.6
15	54			3.6	0.7	1.0
16	41			2.6	0.1	1.1
17	26					1.6
18	15					2.2
19	7					4.5
20	0					2.9
21						1.7
22						1.1
23						0.7
24						0.1

Table 27: 25yr Return Period flood for Solani River

Time	UH ord.	Rainfall Excess (cm)																								DRH	Base Flow	100yr
hr	cumec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	cumec	cumec	Return Period
		0.26	0.26	0.47	0.47	0.47	0.89	1.73	0.99	0.68	0.47	0.36	0.26	0.05	0.06	0.10	0.11	0.16	0.22	0.45	0.29	0.17	0.11	0.07	0.01			
0	0.0	0.0																								0.0	1	1.0
1	15.8	4.0	0.0																							4.0	1	5.0
2	36.2	9.3	4.0	0.0																						13.3	1	14.3
3	61.8	15.9	9.3	7.4	0.0																					32.5	1	33.5
4	95.1	24.4	15.9	16.9	7.4	0.0																				64.5	1	65.5
5	145.9	37.4	24.4	28.9	16.9	7.4	0.0																			114.9	1	115.9
6	230.0	59.0	37.4	44.4	28.9	16.9	14.0	0.0																		200.6	1	201.6
7	360.0	92.3	59.0	68.2	44.4	28.9	32.2	27.3	0.0																	352.2	1	353.2
8	722.0	185.1	92.3	107.5	68.2	44.4	55.0	62.7	15.7	0.0																630.8	1	631.8
9	335.5	86.0	185.1	168.2	107.5	68.2	84.5	107.2	36.0	10.7	0.0															853.3	1	854.3
10	195.4	50.1	86.0	337.4	168.2	107.5	129.7	164.8	61.5	24.5	7.4	0.0														1137.0	1	1138.0
11	153.0	39.2	50.1	156.8	337.4	168.2	204.5	252.7	94.6	41.9	16.9	5.7	0.0													1368.0	1	1369.0
12	119.6	30.7	39.2	91.3	156.8	337.4	320.1	398.5	145.1	64.5	28.9	13.1	4.0	0.0												1629.5	1	1630.5
13	93.3	23.9	30.7	71.5	91.3	156.8	641.9	623.8	228.7	98.9	44.4	22.4	9.3	0.8	0.0											2044.3	1	2045.3
14	72.3	18.5	23.9	55.9	71.5	91.3	298.3	1251.0	358.0	156.0	68.2	34.4	15.9	1.8	0.9	0.0										2445.5	1	2446.5
15	54.3	13.9	18.5	43.6	55.9	71.5	173.8	581.3	718.0	244.1	107.5	52.8	24.4	3.0	2.0	1.6	0.0									2111.9	1	2112.9
16	40.8	10.5	13.9	33.8	43.6	55.9	136.0	338.6	333.6	489.6	168.2	83.2	37.4	4.6	3.5	3.6	1.8	0.0								1758.0	1	1759.0
17	26.3	6.7	10.5	25.4	33.8	43.6	106.3	265.1	194.4	227.5	337.4	130.3	59.0	7.1	5.4	6.1	4.1	2.5	0.0							1465.2	1	1466.2
18	14.6	3.7	6.7	19.1	25.4	33.8	83.0	207.2	152.2	132.5	156.8	261.2	92.3	11.2	8.2	9.5	7.1	5.8	3.5	0.0						1219.2	1	1220.2
19	7.0	1.8	3.7	12.3	19.1	25.4	64.3	161.7	118.9	103.8	91.3	121.4	185.1	17.6	13.0	14.5	10.9	9.9	8.0	7.1	0.0					989.8	1	990.8
20	0.0	0.0	1.8	6.8	12.3	19.1	48.2	125.3	92.8	81.1	71.5	70.7	86.0	35.3	20.3	22.9	16.7	15.2	13.7	16.3	4.6	0.0				760.7	1	761.7
21			0.0	3.3	6.8	12.3	36.3	94.0	71.9	63.3	55.9	55.4	50.1	16.4	40.7	35.8	26.4	23.4	21.0	27.9	10.6	2.7	0.0			654.1	1	655.1
22				0.0	3.3	6.8	23.3	70.8	54.0	49.1	43.6	43.3	39.2	9.5	18.9	71.8	41.3	36.8	32.2	42.9	18.0	6.3	1.8	0.0		612.9	1	613.9
23					0.0	3.3	13.0	45.5	40.6	36.8	33.8	33.8	30.7	7.5	11.0	33.4	82.8	57.7	50.8	65.8	27.7	10.7	4.1	1.1	0.0	589.9	1	590.9
24						0.0	6.2	25.3	26.1	27.7	25.4	26.2	23.9	5.8	8.6	19.4	38.5	115.7	79.5	103.8	42.6	16.4	6.9	2.5	0.2	600.7	1	601.7
25							0.0	12.1	14.5	17.8	19.1	19.6	18.5	4.6	6.7	15.2	22.4	53.7	159.5	162.4	67.1	25.2	10.7	4.3	0.5	634.1	1	635.1
26								0.0	7.0	9.9	12.3	14.8	13.9	3.5	5.3	11.9	17.5	31.3	74.1	325.8	105.0	39.8	16.4	6.6	0.8	695.8	1	696.8
27									0.0	4.7	6.8	9.5	10.5	2.6	4.1	9.3	13.7	24.5	43.2	151.4	210.7	62.2	25.8	10.1	1.3	590.3	1	591.3
28										0.0	3.3	5.3	6.7	2.0	3.1	7.2	10.7	19.2	33.8	88.2	97.9	124.8	40.4	15.9	2.0	460.3	1	461.3
29											0.0	2.5	3.7	1.3	2.3	5.4	8.3	15.0	26.4	69.0	57.0	58.0	80.9	24.9	3.1	357.9	1	358.9
30												0.0	1.8	0.7	1.5	4.1	6.2	11.6	20.6	54.0	44.6	33.8	37.6	49.9	4.8	271.2	1	272.2
31													0.0	0.3	0.8	2.6	4.7	8.7	16.0	42.1	34.9	26.4	21.9	23.2	9.7	191.3	1	192.3
32														0.0	0.4	1.5	3.0	6.5	12.0	32.6	27.2	20.7	17.2	13.5	4.5	139.1	1	140.1
33															0.0	0.7	1.7	4.2	9.0	24.5	21.1	16.1	13.4	10.6	2.6	103.9	1	104.9
34																0.0	0.8	2.3	5.8	18.4	15.8	12.5	10.5	8.3	2.0	76.5	1	77.5
35																	0.0	1.1	3.2	11.8	11.9	9.4	8.1	6.4	1.6	53.6	1	54.6
36																		0.0	1.5	6.6	7.7	7.1	6.1	5.0	1.3	35.2	1	36.2
37																			0.0	3.2	4.3	4.5	4.6	3.7	1.0	21.2	1	22.2
38																				0.0	2.0	2.5	2.9	2.8	0.7	11.1	1	12.1
39																					0.0	1.2	1.6	1.8	0.5	5.2	1	6.2
40																						0.0	0.8	1.0	0.4	2.1	1	3.1
41																							0.0	0.5	0.2	0.7	1	1.7
42																								0	0.1	0.1	1	1.1
43																									0.0	0.0	1	1.0

Design flood Hydrograph; -

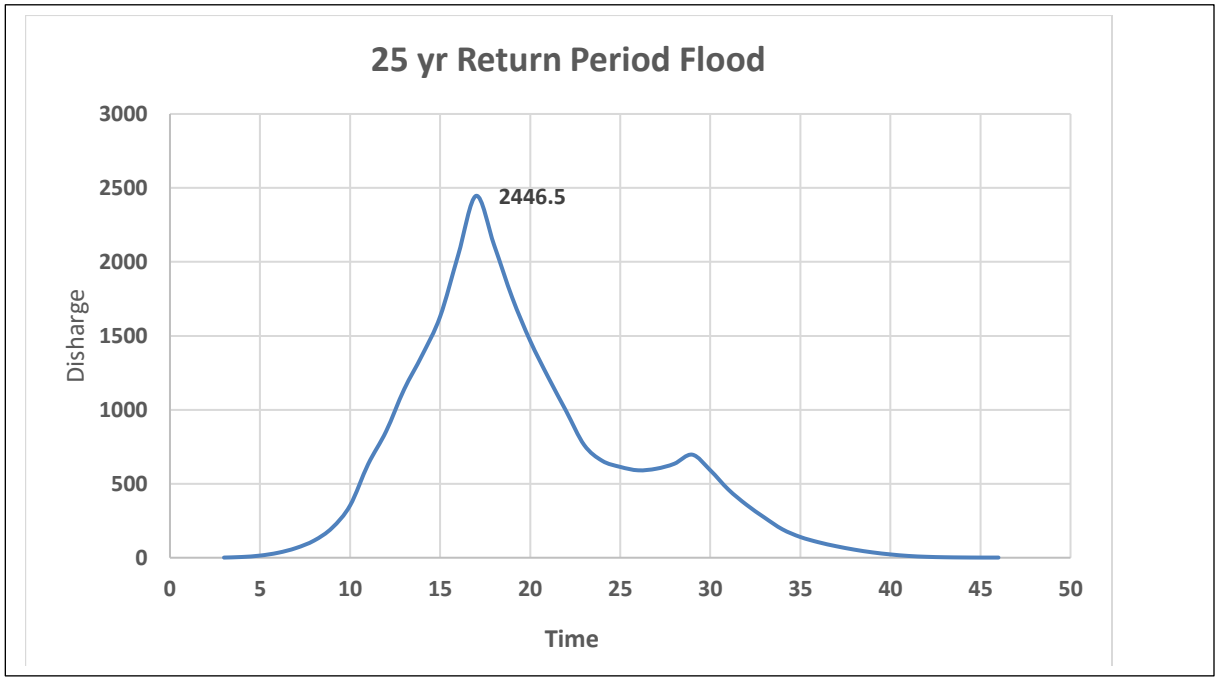


Fig. 13: Design Flood Hydrograph for 25yr Return Period

Table 28: 25 Year Design Flood Hydrograph for Solani River

Time (hr)	Design Flood Ordinates (cumec)	Time (hr)	Design Flood Ordinates (cumec)
0	1	22	614
1	5	23	591
2	14	24	602
3	33	25	635
4	65	26	697
5	116	27	591
6	202	28	461
7	353	29	359
8	632	30	272
9	854	31	192
10	1138	32	140
11	1369	33	105
12	1630	34	77
13	2045	35	55
14	**2447**	36	36
15	2113	37	22
16	1759	38	12
17	1466	39	6
18	1220	40	3
19	991	41	2
20	762	42	1
21	655	43	1

C. 5 Year Return Period Flood Estimation

A design loss rate of 0 to 0 .6 cm /hr as recommended in CWC FER of Western Himalayan Zone-7 report for has been adopted for design flood computation.

As recommended by CWC Western Himalayan Zone-7 report following base flow rate has been adopted:

Base flow / km2 of drainage area = 0.10 (max)

Using the above formula, the computed base flow for the catchment area is 0.61 m^3 /sec.

Time Distribution of Rainfall:

For hourly distribution of rainfall, normalized distribution coefficient has been worked out for bell of 12 hour each using the hourly distribution coefficient of 24-hour rainfall from PMP Atlas of Ganga River Basins. The hourly distribution coefficient of 24-hour rainfall and normalized distribution coefficient for 12-hour bell are mentioned in table no. 8.

After getting rainfall distribution for 24 hrs, rainfall is further bifurcated in the sets of 12hr based on the previous Table 25.

Table 29: RP rainfall depth for 12-hour bells

Catchment	RP Rainfall	24 hr Max (1.15* col(1)	1st Bell 76% of col. (1) B1	2nd Bell 24 % of col. (1) B2
	1	2	**3**	4
70.26	80.79	53.39	16.86	70.26

Two bells on based on its fraction are prepared i.e. 1st 12hr Bell & 2nd 12hr Bell.

Table 30: 12 Hour bell distribution of rainfall

Bell	Rainfall Depth
1st 12Hr Bell	53.4
2nd 12Hr Bell	16.9

After preparing 12hr bells, cumulative rainfall depth, incremental rainfall depth & effective rainfall is calculated by subtracting the losses.

Table 31: Hourly Distribution of Rainfall

Time	Dis. Coeff.	Nor. Dis. Coeff.	Cumulative Rainfall Depth		Incremental Rainfall Depth		Loss	Effective Rainfall Depth	
			1st 12 hr Bell Distribution	2nd 12 Hr Bell Distribution	Incremental Rainfall 1st Bell	Incremental Rainfall 2nd Bell		Eff. Inc. Rainfall Depth 1st Bell	Eff. Inc. Rainfall Depth 2nd Bell
Hr	%	%	(mm)	(mm)	(mm)	(mm)	mm/hr	(mm)	(mm)
1	0.17	0.202	11.94	3.41	11.94	3.41	0.6	11.34	2.81
2	0.27	0.341	18.97	5.75	7.03	2.34	0.6	6.43	1.74
3	0.36	0.452	25.29	7.62	6.32	1.87	0.6	5.72	1.27
4	0.43	0.544	30.21	9.17	4.92	1.55	0.6	4.32	0.95
5	0.48	0.631	33.72	10.64	3.51	1.47	0.6	2.91	0.87
6	0.53	0.7	37.24	11.80	3.51	1.16	0.6	2.91	0.56
7	0.58	0.768	40.75	12.95	3.51	1.15	0.6	2.91	0.55
8	0.63	0.831	44.26	14.01	3.51	1.06	0.6	2.91	0.46
9	0.67	0.882	47.07	14.87	2.81	0.86	0.6	2.21	0.26
10	0.7	0.928	49.18	15.65	2.11	0.78	0.6	1.51	0.18
11	0.73	0.971	51.29	16.37	2.11	0.73	0.6	1.51	0.13
12	0.76	1	53.39	16.86	2.11	0.49	0.6	1.51	0.01

Table 32: Critical sequencing for Effective hourly rainfall

After getting the effective rainfall depth, for both bell, critical sequencing and reverse critical sequencing is done for rainfall & corresponding to its UH ordinates. Then rain convolution for both the bell are obtained, which is further to be used for designing the flood hydrograph for different return period floods

Time	UH ordinate	Critical Sequence of Hourly Rainfall Depth		Reverse Critical Sequence		Conv. Rainfall B2-B1
		1st 12 Hr bell	2nd 12 Hr bell	1st 12 Hr bell	2nd 12 Hr bell	
Hr	cumec	(mm)	(mm)	(mm)	(mm)	(mm)
0	0					
1	16					1.5
2	36					1.5
3	62	1.5	0.0			2.9
4	95	2.2	0.3			2.9
5	146	2.9	0.5	1.5	0.1	2.9
6	230	4.3	1.0	1.5	0.2	5.7
7	360	6.4	1.7	2.9	0.5	11.3
8	722	11.3	2.8	2.9	0.6	6.4
9	335	5.7	1.3	2.9	0.9	4.3
10	195	2.9	0.9	5.7	1.3	2.9
11	153	2.9	0.6	11.3	2.8	2.2
12	120	2.9	0.5	6.4	1.7	1.5
13	93	1.5	0.2	4.3	1.0	0.1
14	72	1.5	0.1	2.9	0.5	0.2
15	54			2.2	0.3	0.5
16	41			1.5	0.0	0.6
17	26					0.9
18	15					1.3
19	7					2.8
20	0					1.7
21						1.0
22						0.5
23						0.3
24						0.0

Table 33: 5-Year Return Period flood for Solani River

Time	UH ord.	Rainfall Excess (cm)																							DRH	Base Flow	100yr Return Period
hr	cumec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	cumec	cumec	
		0.15	0.15	0.29	0.29	0.29	0.57	1.13	0.64	0.43	0.29	0.22	0.15	0.01	0.02	0.05	0.06	0.09	0.13	0.28	0.17	0.10	0.05	0.03	0.00			
0	0.0	0.0																								0.0	1	1.0
1	15.8	2.4	0.0																							2.4	1	3.4
2	36.2	5.5	2.4	0.0																						7.8	1	8.8
3	61.8	9.3	5.5	4.6	0.0																					19.4	1	20.4
4	95.1	14.3	9.3	10.5	4.6	0.0																				38.8	1	39.8
5	145.9	22.0	14.3	18.0	10.5	4.6	0.0																			69.5	1	70.5
6	230.0	34.7	22.0	27.7	18.0	10.5	9.0	0.0																		121.9	1	122.9
7	360.0	54.3	34.7	42.5	27.7	18.0	20.7	17.9	0.0																	215.7	1	216.7
8	722.0	108.9	54.3	67.0	42.5	27.7	35.4	41.0	10.1	0.0																386.9	1	387.9
9	335.5	50.6	108.9	104.9	67.0	42.5	54.4	70.2	23.2	6.8	0.0															528.4	1	529.4
10	195.4	29.5	50.6	210.3	104.9	67.0	83.5	107.9	39.7	15.6	4.6	0.0														713.5	1	714.5
11	153.0	23.1	29.5	97.7	210.3	104.9	131.6	165.5	61.1	26.7	10.5	3.5	0.0													864.3	1	865.3
12	119.6	18.0	23.1	56.9	97.7	210.3	206.0	260.9	93.7	41.1	18.0	8.0	2.4	0.0												1036.1	1	1037.1
13	93.3	14.1	18.0	44.6	56.9	97.7	413.2	408.4	147.8	63.0	27.7	13.7	5.5	0.2	0.0											1310.7	1	1311.7
14	72.3	10.9	14.1	34.8	44.6	56.9	192.0	819.0	231.3	99.3	42.5	21.0	9.3	0.5	0.3	0.0										1576.5	1	1577.5
15	54.3	8.2	10.9	27.2	34.8	44.6	111.9	380.5	463.9	155.4	67.0	32.2	14.3	0.8	0.6	0.7	0.0									1353.2	1	1354.2
16	40.8	6.2	8.2	21.1	27.2	34.8	87.6	221.7	215.6	311.8	104.9	50.8	22.0	1.2	1.1	1.7	0.9	0.0								1116.5	1	1117.5
17	26.3	4.0	6.2	15.8	21.1	27.2	68.4	173.6	125.6	144.9	210.3	79.6	34.7	1.8	1.7	2.9	2.0	1.4	0.0							920.9	1	921.9
18	14.6	2.2	4.0	11.9	15.8	21.1	53.4	135.7	98.3	84.4	97.7	159.6	54.3	2.9	2.6	4.4	3.5	3.1	2.0	0.0						756.8	1	757.8
19	7.0	1.1	2.2	7.6	11.9	15.8	41.4	105.9	76.9	66.1	56.9	74.1	108.9	4.5	4.0	6.7	5.4	5.4	4.6	4.4	0.0					602.7	1	603.7
20	0.0	0.0	1.1	4.2	7.6	11.9	31.1	82.1	60.0	51.6	44.6	43.2	50.6	9.0	6.3	10.6	8.2	8.2	7.9	10.1	2.7	0.0				450.1	1	451.1
21			0.0	2.0	4.2	7.6	23.4	61.5	46.5	40.3	34.8	33.8	29.5	4.2	12.7	16.6	13.0	12.6	12.1	17.4	6.3	1.5	0.0			378.1	1	379.1
22				0.0	2.0	4.2	15.0	46.3	34.9	31.2	27.2	26.4	23.1	2.4	5.9	33.4	20.3	19.9	18.5	26.7	10.8	3.4	0.9	0.0		350.6	1	351.6
23					0.0	2.0	8.3	29.8	26.2	23.4	21.1	20.6	18.0	1.9	3.4	15.5	40.7	31.2	29.2	40.9	16.6	5.9	2.0	0.4	0.0	335.3	1	336.3
24						0.0	4.0	16.5	16.9	17.6	15.8	16.0	14.1	1.5	2.7	9.0	18.9	62.6	45.8	64.5	25.4	9.0	3.4	0.9	0.0	340.8	1	341.8
25							0.0	7.9	9.4	11.3	11.9	12.0	10.9	1.2	2.1	7.1	11.0	29.1	91.8	101.0	40.1	13.9	5.2	1.6	0.0	359.6	1	360.6
26								0.0	4.5	6.3	7.6	9.0	8.2	0.9	1.6	5.5	8.6	16.9	42.7	202.6	62.8	21.9	8.0	2.5	0.1	405.2	1	406.2
27									0.0	3.0	4.2	5.8	6.2	0.7	1.3	4.3	6.7	13.3	24.9	94.1	125.9	34.2	12.6	3.8	0.1	338.1	1	339.1
28										0.0	2.0	3.2	4.0	0.5	1.0	3.3	5.3	10.4	19.5	54.8	58.5	68.7	19.7	6.0	0.1	254.9	1	255.9
29											0.0	1.5	2.2	0.3	0.7	2.5	4.1	8.1	15.2	42.9	34.1	31.9	39.5	9.4	0.2	191.1	1	192.1
30												0.0	1.1	0.2	0.5	1.9	3.1	6.3	11.9	33.6	26.7	18.6	18.3	18.8	0.4	140.0	1	141.0
31													0.0	0.1	0.3	1.2	2.3	4.7	9.2	26.2	20.9	14.6	10.7	8.7	0.7	99.4	1	100.4
32														0.0	0.1	0.7	1.5	3.5	6.9	20.3	16.3	11.4	8.4	5.1	0.3	74.3	1	75.3
33															0.0	0.3	0.8	2.3	5.2	15.2	12.6	8.9	6.5	4.0	0.2	55.7	1	56.7
34																0.0	0.4	1.3	3.3	11.5	9.5	6.9	5.1	3.1	0.2	40.8	1	41.8
35																	0.0	0.6	1.9	7.4	7.1	5.2	4.0	2.4	0.1	28.0	1	29.0
36																		0.0	0.9	4.1	4.6	3.9	3.0	1.9	0.1	17.5	1	18.5
37																			0.0	2.0	2.5	2.5	2.2	1.4	0.1	8.8	1	9.8
38																				0.0	1.2	1.4	1.4	1.1	0.1	3.9	1	4.9
39																					0.0	0.7	0.8	0.7	0.0	1.5	1	2.5
40																						0.0	0.4	0.4	0.0	0.4	1	1.4
41																							0.0	0.2	0.0	0.0	1	1.0
42																								0	0.0	0.0	1	1.0
43																									0.0	0.0	1	1.0

Design Flood Hydrograph

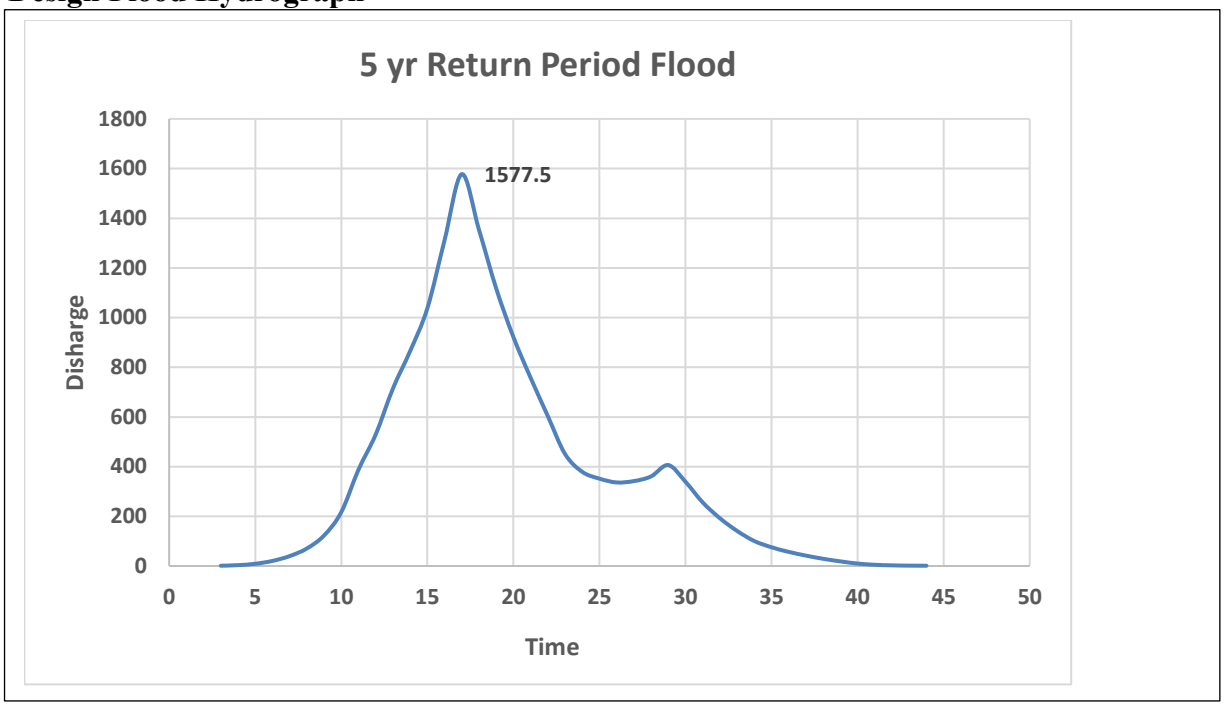


Fig.14: Design Flood Hydrograph for 5yr Return Period

Table 34: 5-Year Design Flood Hydrograph for Solani River

Time (hr)	Design Flood Ordinates (cumec)	Time (hr)	Design Flood Ordinates (cumec)
0	1	22	352
1	3	23	336
2	9	24	342
3	20	25	361
4	40	26	406
5	70	27	339
6	123	28	256
7	217	29	192
8	388	30	141
9	529	31	100
10	714	32	75
11	865	33	57
12	1037	34	42
13	1312	35	29
14	**1577**	36	18
15	1354	37	10
16	1118	38	5
17	922	39	3
18	758	40	1
19	604	41	1
20	451	42	1
21	379	43	1

At various key locations for specific return period flows are back routed as mentioned in the table given below.

Table 35: Discharges at Different Key Location:

Identification Name	Catchment Area	Return Period(Year)			
		5	25	50	100
Kheri	232	387	600	689	750
Hasanpur	267	446	691	794	864
Shahpur	411	686	1065	1223	1331
Roorkee	518	865	1342	1542	1677
Solani Ratmau Conf.	884	1476	2290	2631	2862
Outlet	944	1576	2446	2809	3056

Identification Name	Catchment Area (km^2)	Return Period (Year) Flow (cumec)			
		5	25	50	100
Kurkawala	28.87	61	83	93	103
Lam Grunt	85.82	183	246	276	306
Sohalpur Sikrodha	180.00	383	515	579	643
Dhanauri	296.69	632	850	954	1059
Outlet	337.00	718	965	1084	1203

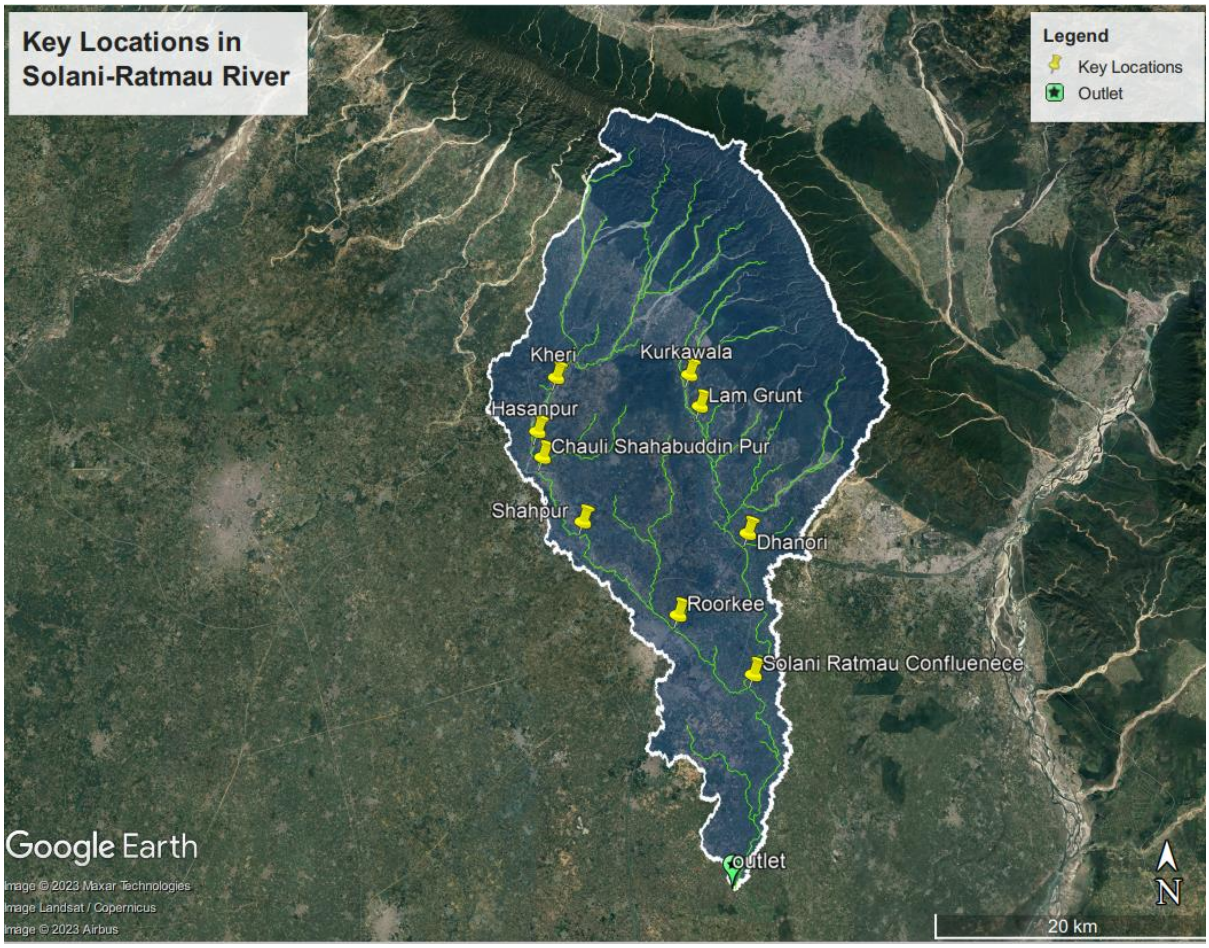


Fig 15. Key Location of Solani-Ratmau Basin

Table 36: Estimated discharges for Different ungauged watershed

Major Ungauged watersheds are identified and flows are calculated for specific return period as mentioned the table given below.

Watershed Id	Catchment Area (Sq. km.	Return Period(Year)			
		5	25	50	100
1	277	463	718	824	897
2	124	207	321	369	401
3	122	204	316	363	395
4	52	87	135	155	168
5	59	99	153	176	191

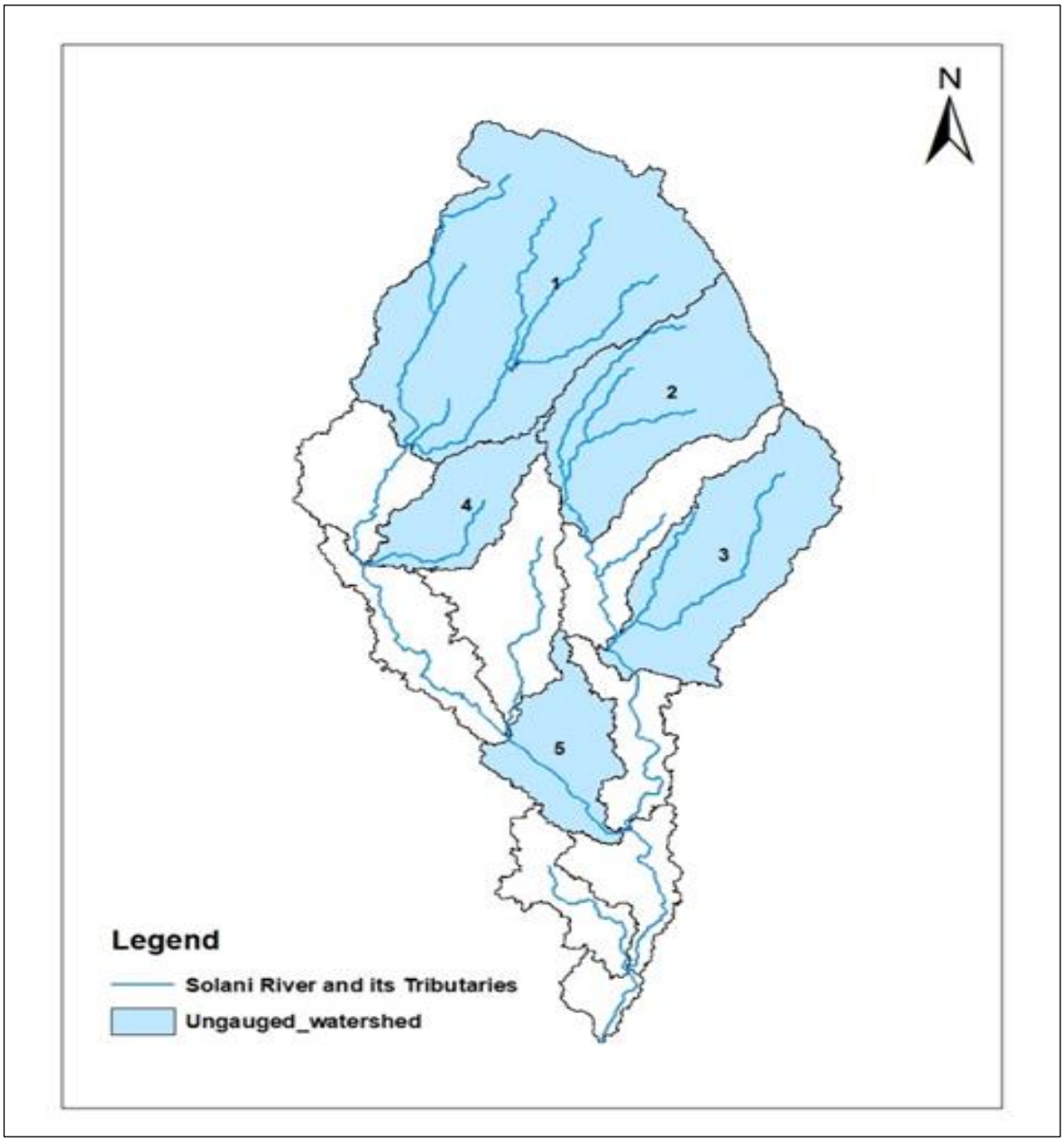


Fig. 16: Ungauged watersheds contributing water to the Solani River. The Label ID denotes the numbering of watersheds

5.2 DEVELOPMENT OF REGIONAL FLOOD FREQUENCY RELATIONSHIP USING L-MOMENTS APPROACH FOR UNGAUGED CATCHMENTS:

For development of regional flood frequency relationships for ungauged catchments, the regional flood frequency relationships developed for gauged catchments have been coupled with the regional relationships between mean annual peak floods and catchment areas of the respective Zones. In this manner the following form of regional flood frequency relationships have been developed for ungauged catchments.

For estimation of floods of commonly used returns periods for an ungauged catchment for a given catchment area the value of flood estimates may be directly obtained from the fig. mentioned below for western Zone-7 which is adopted from Regional Flood Frequency Estimation in India (Rakesh Kumar, 2011).

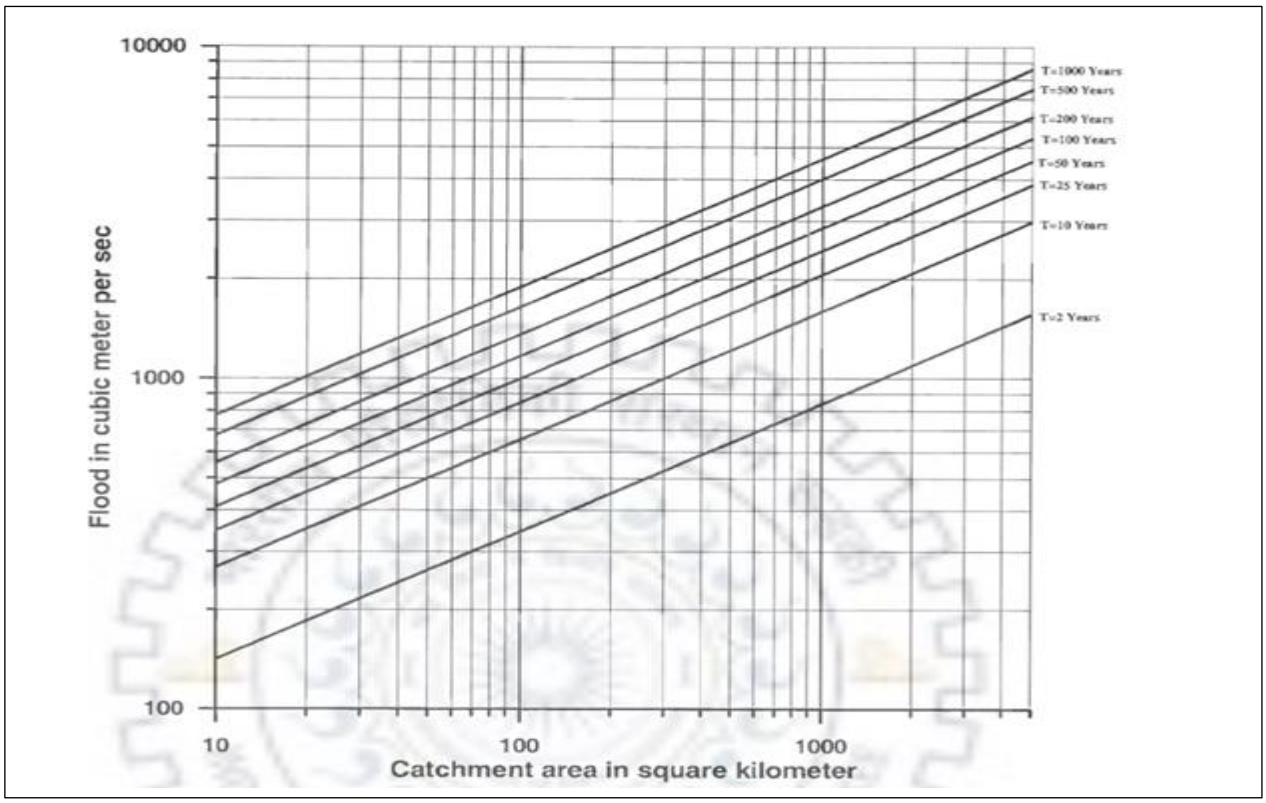


Fig. 17 Variation of floods of Various return periods with catchment area based on L-moments for Sub-Himalayan region Zone-7

Design Flood Peak from Different Method:

Based on the above-mentioned envelope derived by L-moments return period flood peak values are compared with the design values obtained by SUH (synthetic unit hydrograph).

Table 37: Design flood peak comparison at Solani River

Return Period	Solani River	
	SUH	L Moments
5	1576	900
25	2446	2100
50	2809	2400
100	3056	2900

Return Period	Ratmau River	
	SUH	L Moments
5	718	475
25	965	1500
50	1084	1650
100	1203	1850

7. River Geometry Creation in RAS Mapper: -

In the RAS tab of HEC-RAS, the projection and datum (UTM Zone 43 N, WGS 84) have been defined. The Cartosat DEM and Google Earth images have been added to define the river geometry for 1D flow modeling. River geometry (channel central line, bank lines, flow paths, transverse cross-sections, and levee) has been created using Cartosat digital elevation model (DEM) and geomorphological map. Manning's N values for built-up areas, barren land, forest, river bed, scrub and arable land on a transverse cross- section has been taken from Chow (1959) and Syme (2008). The maximum LU/LC category on a cross-section is 20. In other words, on a cross-section, HECRAS can plot a maximum of 20 Manning's N values.

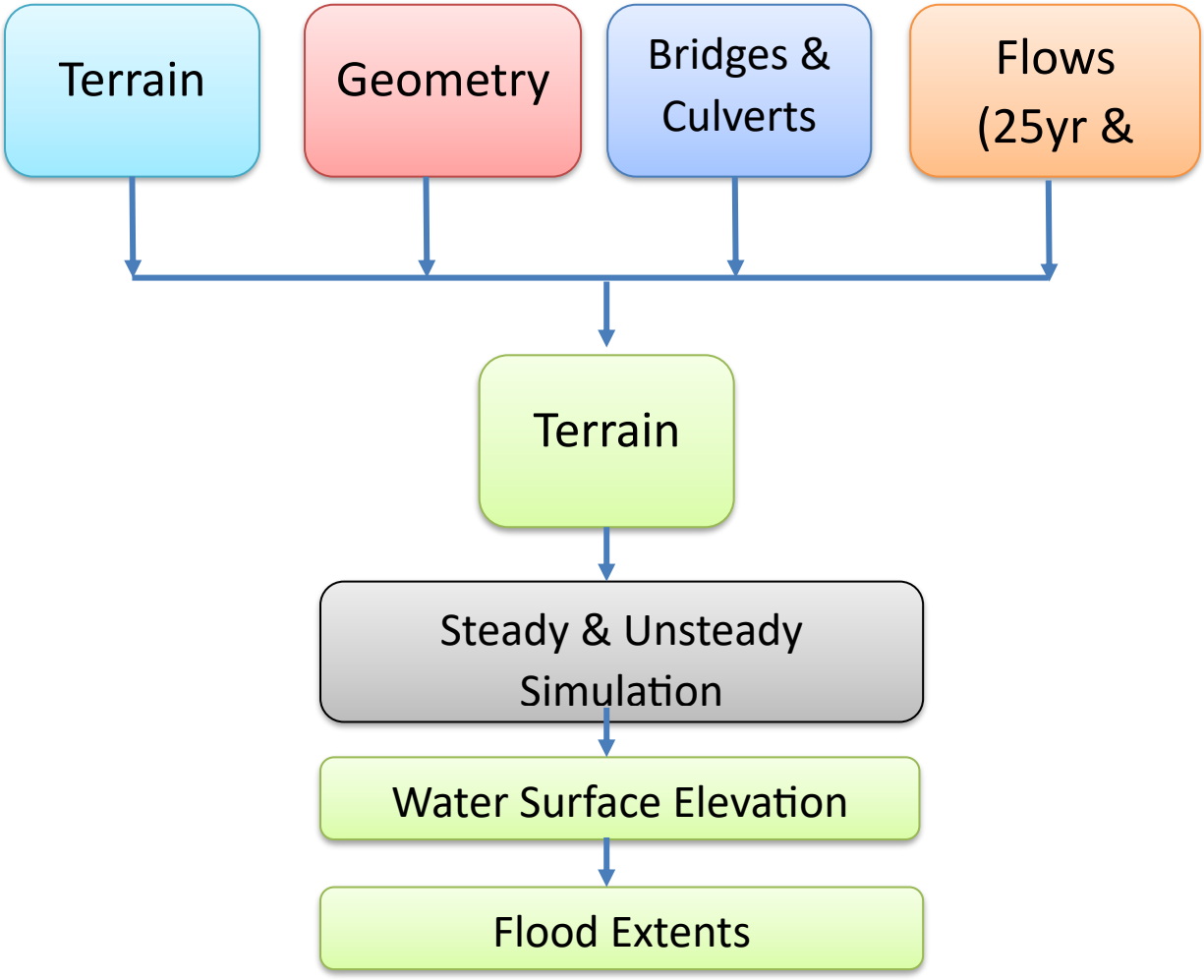


Fig. 18: Flow chart for modelling steps

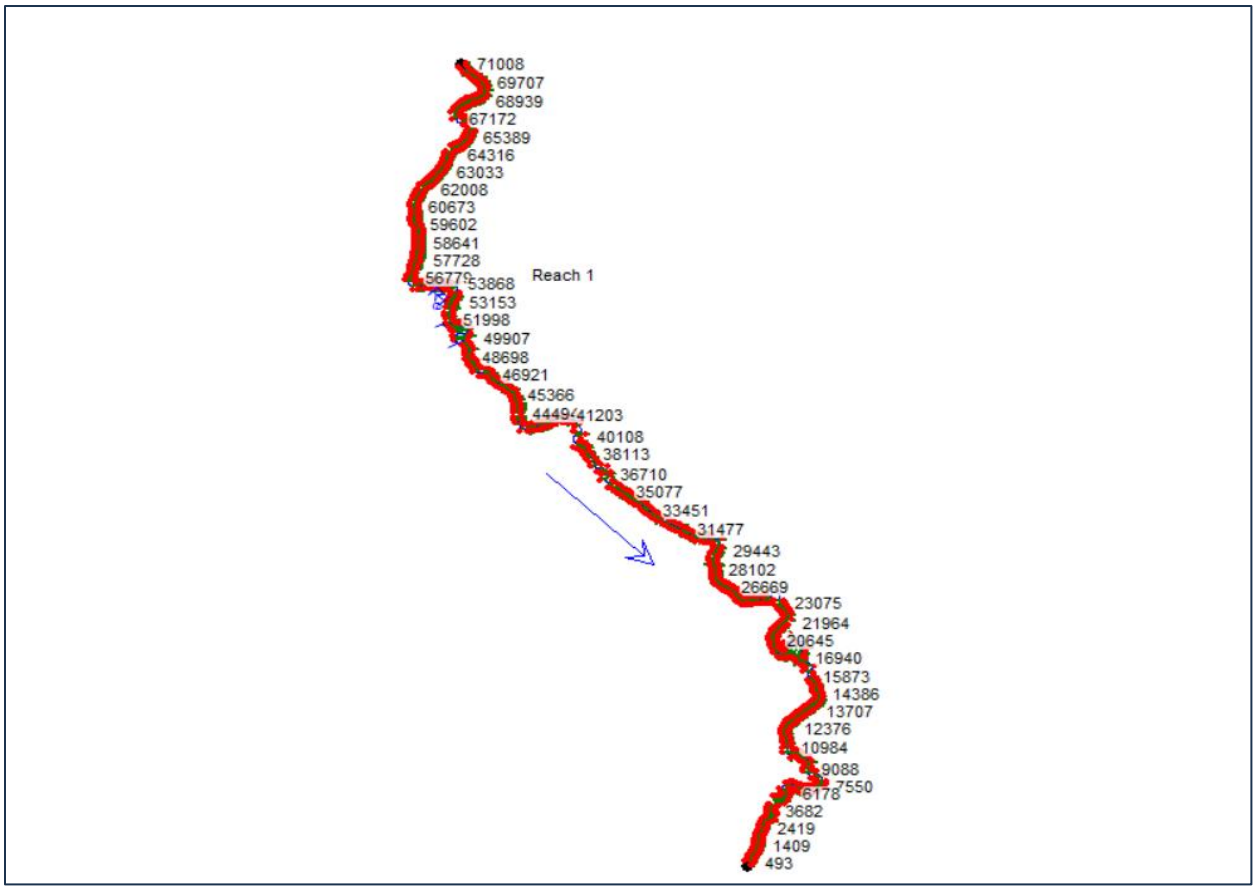


Fig. 19: River geometry with cross section.

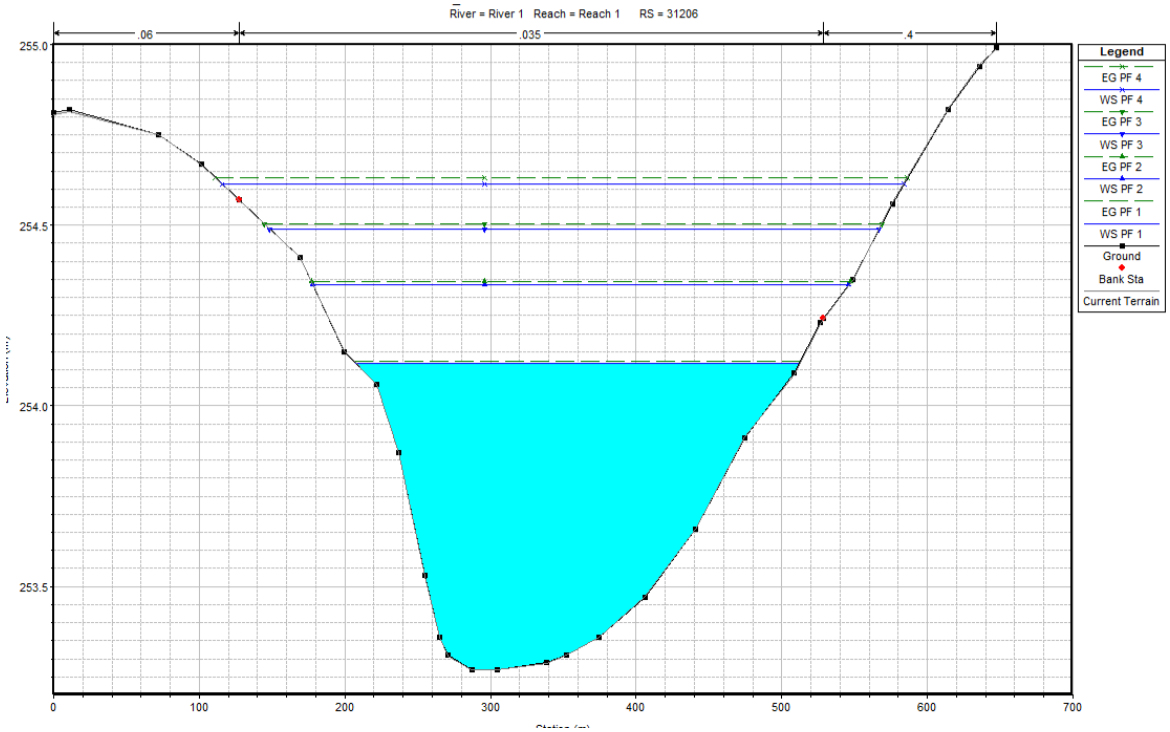


Fig. 20 Transverse cross-section at Roorkee showing N values.

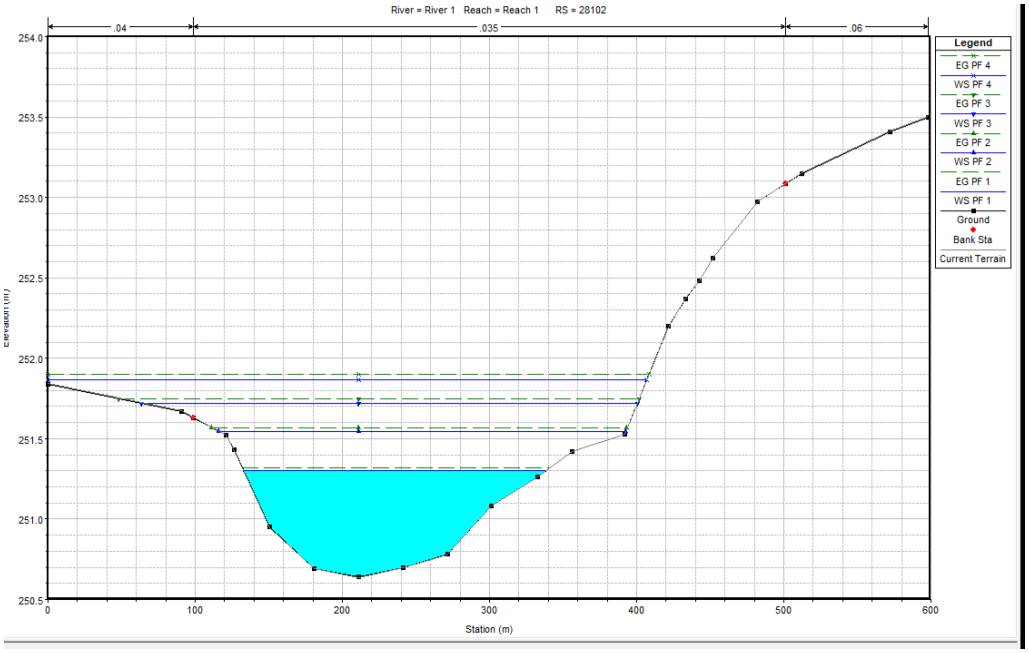


Fig. 21: Transverse cross-section at Roorkee showing N values.

8. RAS Geometry used in HEC-RAS 1D Flow Modelling & Flood Plain Zoning

In HEC RAS, the boundary conditions at downstream cross-sections have been defined on the basis of normal depth. The normal depth method utilizes an energy slope (average bed slope in m/m) to compute flood depth using Manning's N values. The estimated discharges at different return periods (5, 25, 50 and 100 years) for each ungauged watershed have been considered in HEC RAS by adding flow change location from upstream to downstream. Based on the input data (Manning's N values, normal depth, and discharges), the HEC-RAS computed rating curves for entire cross- sections. A sum of 701 cross-sections was drawn for 1D flow modeling. In other words, six cross-sections per kilometer have been made on the basis of channel curvature.

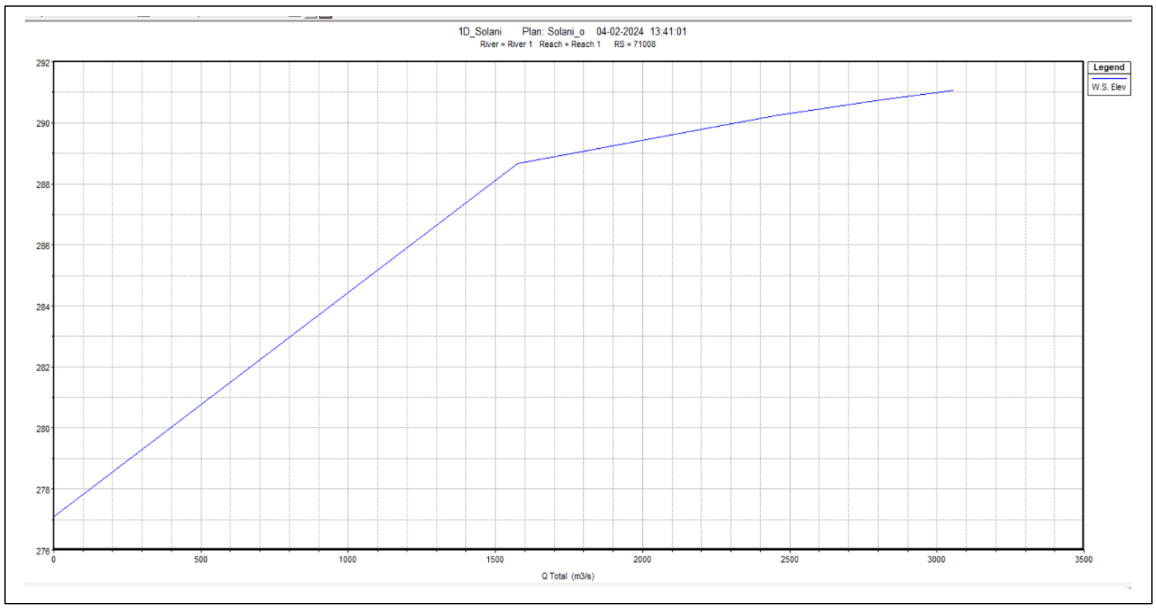


Fig. 22: Rating Curve of Solani River.

Table 38: Discharges (in m^3/sec) at different return periods considered at flow change location in HEC-RAS steady flow modeling.

Identification Name	Catchment Area of Drain(km^2)	Catchment Area (km^2)	Return Period(Year) Flow (cumec)			
			5	25	50	100
Kheri	232	232	387	600	689	750
Hasanpur	35	267	446	691	794	864
Shahpur	144	411	686	1065	1223	1331
Roorkee	107	518	865	1342	1542	1677
Solani Ratmau Conf.	366	884	1476	2290	2631	2862
Outlet	117	1001	1576	2446	2809	3056

Table 39: Cross-section wise flood level (m) above mean sea level at different return periods at some prominent location.

XS	Location	25	50	100
1	Biharigarh	304.62	305.12	305.49
2	Aurangzeb Pur	300.29	300.70	301.09
3	Kheri	290.71	291.12	291.46
4	Chhutmalpur	286.04	286.35	286.87
5	Hasanpur	280.17	280.68	281.02
6	Latifpur	277.31	277.79	278.25
7	Saidpur	273.78	274.01	274.36
8	Bhagwanpur	267.77	268.05	268.66
9	Roorkee	256.5	257.1	257.9
10	Akbarpur	252.82	253.11	253.33
11	After confluence With Ratmau	248.522	248.88	249.17
12	Mohammadpur	237.4	238.24	238.60

9. Results Analysis & Physical Validation

For validation, the floodplain modeling is correlated recent year flood mark. Modeled flood extent is matching with the observed flood extent between at various bridge locations. Mostly crop land and open land will be submerged.

10. Sensitivity Waterway

The analysis incorporates the estimated discharge at a 25-year return period for each location of flow change to determine the necessary channel width or Lacey's Waterway. The provision of waterway width varies based on the riverbed conditions, ranging from 0.25 to 0.9 times Lacey's Waterway, contingent upon the site's topography. In this study, areas where the natural waterway measures less than 0.65 times Lacey's Waterway are classified as sensitive zones. (Reference: Theory and Design of Irrigation Structures by Dr. Varshney)

Table 40: Lacey's Waterway (in m) at 25-year Return flood considered at flow change location.

Identification Name	Catchment Area of Drain(km^2)	Cumulative Catchment Area (km^2)	Q25 (cumec)	Lacey's Waterway(m)	Required Min. Watereway (m)
Kheri	232	232	600	72.35	47.03
Hasanpur	35	267	691	77.62	50.45
Shahpur	144	411	1065	96.30	62.59
Roorkee	107	518	1342	108.11	70.27
Solani Ratmau Conf.	366	884	2290	141.23	91.80
Outlet	117	1001	2446	150.28	97.68

11. Results & Finding: -

The flood inundation area map was created utilizing flood propagation modeling, employing optimized roughness parameters acquired through automated calibration with HEC-RAS within a GIS environment. To address uncertainties in hydrological input, an uncertainty analysis was conducted using a Monte Carlo framework. Notably, the novelty of this approach lies in its consideration of the

return time of flooding rather than solely focusing on the hydrograph. While a deterministic approach typically advocates for the consideration of fixed hydrodynamic variables based on a flood hydrograph with predetermined return periods, our study delved into discharges at specific return periods. Additionally, boundary conditions for each cross-section were established using the average bed slope.

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3. Syme, W.J. (2008) Flooding In Urban Areas-2D Modelling Approaches for Buildings and Fences. In Proceedings of the Engineers Australia, 9th National Conference on Hydraulics in Water Engineering, Darwin, NT, Australia, 23–26 September.

4. Flood Estimation Report for Western Himalayan Zone-7.

5. PMP Atlas for Ganga River Basin Including Yamuna Final Report,2015.

6. “Regional Flood Frequency Estimation in India.” by Rakesh Kumar.2009.

Annexures

ANNEXURE-1

Probability paper based on (Cs, T)

Here mentioning the logarithmic probability paper used for flood frequency & D-index calculations.

Coefficient of skew, C_s	Recurrence interval T in years						
	2	10	25	50	100	200	1000
3.0	–0.396	1.180	2.278	3.152	4.051	4.970	7.250
2.5	–0.360	1.250	2.262	3.048	3.845	4.652	6.600
2.2	–0.330	1.284	2.240	2.970	3.705	4.444	6.200
2.0	–0.307	1.302	2.219	2.912	3.605	4.298	5.910
1.8	–0.282	1.318	2.193	2.848	3.499	4.147	5.660
1.6	–0.254	1.329	2.163	2.780	3.388	3.990	5.390
1.4	–0.225	1.337	2.128	2.706	3.271	3.828	5.110
1.2	–0.195	1.340	2.087	2.626	3.149	3.661	4.820
1.0	–0.164	1.340	2.043	2.542	3.022	3.489	4.540
0.9	–0.148	1.339	2.018	2.498	2.957	3.401	4.395
0.8	–0.132	1.336	1.998	2.453	2.891	3.312	4.250
0.7	–0.116	1.333	1.967	2.407	2.824	3.223	4.105
0.6	–0.099	1.328	1.939	2.359	2.755	3.132	3.960
0.5	–0.083	1.323	1.910	2.311	2.686	3.041	3.815
0.4	–0.066	1.317	1.880	2.261	2.615	2.949	3.670
0.3	–0.050	1.309	1.849	2.211	2.544	2.856	3.525
0.2	–0.033	1.301	1.818	2.159	2.472	2.763	3.380
0.1	–0.017	1.292	1.785	2.107	2.400	2.670	3.235
0.0	**0.000**	**1.282**	**1.751**	**2.054**	**2.326**	**2.576**	**3.090**
–0.1	0.017	1.270	1.716	2.000	2.252	2.482	2.950
–0.2	0.033	1.258	1.680	1.945	2.178	2.388	2.810
–0.3	0.050	1.245	1.643	1.890	2.104	2.294	2.675
–0.4	0.066	1.231	1.606	1.834	2.029	2.201	2.540
–0.5	0.083	1.216	1.567	1.777	1.955	2.108	2.400
–0.6	0.099	1.200	1.528	1.720	1.880	2.016	2.275
–0.7	0.116	1.183	1.488	1.663	1.806	1.926	2.150
–0.8	0.132	1.166	1.448	1.606	1.733	1.837	2.035
–0.9	0.148	1.147	1.407	1.549	1.660	1.749	1.910
–1.0	0.164	1.128	1.366	1.492	1.588	1.664	1.880
–1.4	0.225	1.041	1.198	1.270	1.318	1.351	1.465
–1.8	0.282	0.945	1.035	1.069	1.087	1.097	1.130
–2.2	0.330	0.844	0.888	0.900	0.905	0.907	0.910
–3.0	0.396	0.660	0.666	0.666	0.667	0.667	0.668

[**Note:** C_s = 0 corresponds to log-normal distribution]

ANNEXURE-2

Distribution Table

Annexure 2.1 (The Table is taken from CWC flood estimation report for western Himalayan Zone-7)

ZONE - 7

CATCHMENT AREA (Km²)	DESIGN STORM DURATION (HOURS)																								CATCHMENT AREA (Km²)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
0000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0000
50	94.00	95.20	96.40	96.83	97.27	97.70	97.79	97.88	97.97	98.07	98.16	98.25	98.31	98.38	98.44	98.50	98.56	98.62	98.69	98.75	98.81	98.88	98.94	99.00	50
100	89.00	90.95	92.90	93.73	94.57	95.40	95.58	95.77	95.95	96.13	96.32	96.50	96.62	96.75	96.88	97.00	97.12	97.25	97.38	97.50	97.62	97.75	97.87	98.00	100
150	84.50	87.00	89.50	90.70	91.90	93.10	93.42	93.73	94.05	94.37	94.68	95.00	95.17	95.33	95.50	95.67	95.83	96.00	96.17	96.33	96.50	96.67	96.83	97.00	150
200	80.75	83.47	86.20	87.40	88.60	89.80	90.42	91.03	91.65	92.27	92.88	93.50	93.71	93.92	94.12	94.33	94.54	94.75	94.96	95.17	95.37	95.58	95.79	96.00	200
250	77.25	80.12	83.00	84.03	86.67	88.50	89.08	89.67	90.25	90.83	91.42	92.00	92.27	92.53	92.80	93.07	93.33	93.60	93.87	94.13	94.40	94.67	94.93	95.20	250
300	74.25	77.12	80.00	82.07	84.13	86.20	86.92	87.63	88.35	89.07	89.78	90.50	90.82	91.15	91.47	91.80	92.12	92.45	92.77	93.10	93.42	93.75	94.07	94.40	300
350			77.20	79.43	81.67	83.90	84.77	85.63	86.50	87.37	88.23	89.10	89.48	89.87	90.25	90.63	91.02	91.40	91.78	92.17	92.55	92.93	93.32	93.70	350
400			74.50	76.87	79.23	81.60	82.62	83.65	84.67	85.70	86.72	87.75	88.19	88.62	89.06	89.50	89.94	90.37	90.81	91.25	91.69	92.12	92.56	93.00	400
450			72.00	74.50	77.00	79.50	80.67	81.83	83.00	84.17	85.33	86.50	86.98	87.47	87.95	88.43	88.92	89.40	89.88	90.37	90.85	91.33	91.82	92.30	450
500			70.00	72.40	74.80	77.20	78.56	79.88	81.22	82.57	83.91	85.25	85.78	86.31	86.84	87.37	87.90	88.42	88.95	89.48	90.01	90.54	91.07	91.60	500
600												83.00	83.60	84.21	84.81	85.42	86.02	86.62	87.23	87.83	88.44	89.04	89.65	90.25	600
700												81.00	81.67	82.33	83.00	83.67	84.33	85.00	85.67	86.33	87.00	87.67	88.33	89.00	700
800												79.60	80.30	81.00	81.70	82.40	83.10	83.80	84.50	85.20	85.90	86.60	87.30	88.00	800
900												78.40	79.12	79.83	80.55	81.27	81.98	82.70	83.42	84.13	84.85	85.57	86.28	87.00	900
1000												77.20	77.95	78.71	79.46	80.22	80.97	81.72	82.48	83.23	83.99	84.74	85.50	86.25	1000
1100												76.20	76.97	77.75	78.52	79.30	80.07	80.85	81.62	82.40	83.17	83.95	84.72	85.50	1100
1200												75.50	76.29	77.08	77.87	78.67	79.46	80.25	81.04	81.83	82.62	83.42	84.21	85.00	1200
1300																								84.50	1300
1400																								84.00	1400
1500																								83.50	1500
2000																								82.70	2000

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Annexure 2.2 (The Table is taken from CWC flood estimation report for western Himalayan Zone-7)

INTER-MEDIATE HOURS	DESIGN STORM DURATION (HOURS)																								INTER-MEDIATE HOURS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	1.00	0.85	0.73	0.62	0.56	0.52	0.46	0.43	0.41	0.38	0.37	0.34	0.32	0.30	0.28	0.26	0.25	0.23	0.21	0.20	0.19	0.18	0.17	0.17	1
2		1.00	0.92	0.82	0.75	0.69	0.63	0.60	0.57	0.54	0.52	0.49	0.44	0.43	0.41	0.40	0.39	0.37	0.33	0.32	0.31	0.30	0.28	0.27	2
3			1.00	0.94	0.87	0.82	0.75	0.71	0.68	0.65	0.62	0.60	0.55	0.53	0.51	0.50	0.48	0.46	0.43	0.41	0.39	0.38	0.37	0.36	3
4				1.00	0.96	0.91	0.85	0.81	0.76	0.73	0.71	0.67	0.63	0.61	0.59	0.57	0.56	0.54	0.50	0.48	0.46	0.45	0.44	0.43	4
5					1.00	0.97	0.92	0.88	0.84	0.81	0.77	0.74	0.70	0.68	0.66	0.64	0.62	0.60	0.56	0.54	0.52	0.51	0.50	0.48	5
6						1.00	0.97	0.94	0.90	0.87	0.83	0.81	0.77	0.74	0.72	0.69	0.68	0.66	0.61	0.59	0.57	0.56	0.55	0.53	6
7							1.00	0.97	0.95	0.92	0.88	0.86	0.82	0.79	0.77	0.74	0.73	0.71	0.66	0.64	0.62	0.61	0.60	0.58	7
8								1.00	0.98	0.95	0.93	0.90	0.86	0.84	0.81	0.79	0.77	0.75	0.71	0.69	0.67	0.66	0.65	0.63	8
9									1.00	0.98	0.96	0.94	0.90	0.87	0.85	0.83	0.81	0.79	0.75	0.73	0.71	0.70	0.69	0.67	9
10										1.00	0.98	0.96	0.93	0.90	0.88	0.87	0.85	0.83	0.79	0.77	0.74	0.73	0.72	0.70	10
11											1.00	0.98	0.96	0.93	0.91	0.90	0.88	0.86	0.82	0.80	0.77	0.76	0.75	0.73	11
12												1.00	0.98	0.96	0.94	0.92	0.90	0.88	0.85	0.83	0.80	0.79	0.78	0.76	12
13													1.00	0.98	0.96	0.94	0.92	0.90	0.88	0.86	0.83	0.82	0.81	0.79	13
14														1.00	0.98	0.96	0.94	0.92	0.90	0.89	0.86	0.85	0.83	0.82	14
15															1.00	0.98	0.96	0.94	0.92	0.91	0.89	0.87	0.85	0.84	15
16																1.00	0.98	0.96	0.94	0.93	0.91	0.89	0.87	0.86	16
17																	1.00	0.98	0.96	0.95	0.93	0.91	0.89	0.88	17
18																		1.00	0.98	0.97	0.95	0.93	0.91	0.90	18
19																			1.00	0.99	0.97	0.95	0.93	0.92	19
20																				1.00	0.99	0.97	0.95	0.94	20
21																					1.00	0.99	0.97	0.96	21
22																						1.00	0.99	0.98	22
23																							1.00	0.99	23
24																								1.00	24

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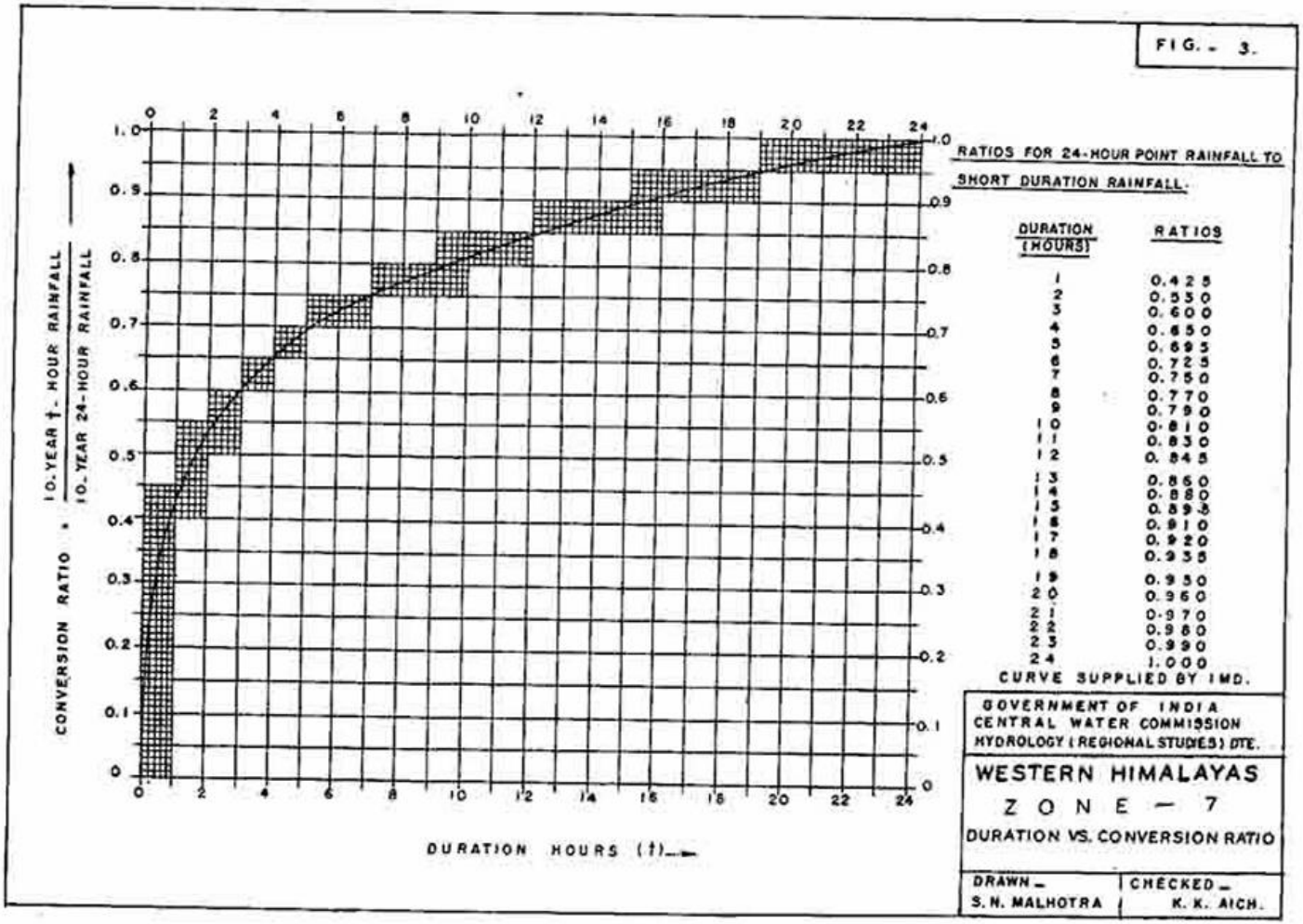
(Time distribution coefficient table for cumulative hourly rainfall)

Annexure 2.3 (The Table is taken from CWC flood estimation report for western Himalayan Zone-7)



ANNEXURE-3

Chow's table for Manning's N

Type of Channel and Description	Minimum	Normal	Maximum
1. Main Channels			
a. clean, straight, full stage, no rifts or deep pools	0.025	0.03	0.033
b. same as above, but more stones and weeds	0.03	0.035	0.04
c. clean, winding, some pools and shoals	0.033	0.04	0.045
d. same as above, but some weeds and stones	0.035	0.045	0.05
e. same as above, lower stages, more ineffective slopes and sections	0.04	0.048	0.055
f. same as "d" with more stones	0.045	0.05	0.06
g. sluggish reaches, weedy, deep pools	0.05	0.07	0.08
h. very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.1	0.15
2. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
a. bottom: gravels, cobbles, and few boulders	0.03	0.04	0.05
b. bottom: cobbles with large boulders	0.04	0.05	0.07
3. Floodplains			
a. Pasture, no brush			
1.short grass	0.025	0.03	0.035
2. high grass	0.03	0.035	0.05
b. Cultivated areas			
1. no crop	0.02	0.03	0.04
2. mature row crops	0.025	0.035	0.045
3. mature field crops	0.03	0.04	0.05
c. Brush			
1. scattered brush, heavy weeds	0.035	0.05	0.07
2. light brush and trees, in winter	0.035	0.05	0.06
3. light brush and trees, in summer	0.04	0.06	0.08
4. medium to dense brush, in winter	0.045	0.07	0.11
5. medium to dense brush, in summer	0.07	0.1	0.16
d. Trees			
1. dense willows, summer, straight	0.11	0.15	0.2
2. cleared land with tree stumps, no sprouts	0.03	0.04	0.05
3. same as above, but with heavy growth of sprouts	0.05	0.06	0.08
4. heavy stand of timber, a few down trees, little undergrowth, flood stage below branches	0.08	0.1	0.12

5. same as 4. with flood stage reaching branches	0.1	0.12	0.16
4. Excavated or Dredged Channels			
a. Earth, straight, and uniform			
1. clean, recently completed	0.016	0.018	0.02
2. clean, after weathering	0.018	0.022	0.025
3. gravel, uniform section, clean	0.022	0.025	0.03
4. with short grass, few weeds	0.022	0.027	0.033
b. Earth winding and sluggish			
1. no vegetation	0.023	0.025	0.03
2. grass, some weeds	0.025	0.03	0.033
3. dense weeds or aquatic plants in deep channels	0.03	0.035	0.04
4. earth bottom and rubble sides	0.028	0.03	0.035
5. stony bottom and weedy banks	0.025	0.035	0.04
6. cobble bottom and clean sides	0.03	0.04	0.05
c. Dragline-excavated or dredged			
1. no vegetation	0.025	0.028	0.033
2. light brush on banks	0.035	0.05	0.06
d. Rock cuts			
1. smooth and uniform	0.025	0.035	0.04
2. jagged and irregular	0.035	0.04	0.05
e. Channels not maintained, weeds and brush uncut			
1. dense weeds, high as flow depth	0.05	0.08	0.12
2. clean bottom, brush on sides	0.04	0.05	0.08
3. same as above, highest stage of flow	0.045	0.07	0.11
4. dense brush, high stage	0.08	0.1	0.14
5. Lined or Constructed Channels			
a. Cement			
1. neat surface	0.01	0.011	0.013
2. mortar	0.011	0.013	0.015
b. Wood			
1. planed, untreated	0.01	0.012	0.014
2. planed, creosoted	0.011	0.012	0.015
3. unplaned	0.011	0.013	0.015
4. plank with battens	0.012	0.015	0.018
5. lined with roofing paper	0.01	0.014	0.017
c. Concrete			

1. trowel finish	0.011	0.013	0.015
2. float finish	0.013	0.015	0.016
3. finished, with gravel on bottom	0.015	0.017	0.02
4. unfinished	0.014	0.017	0.02
5. gunite, good section	0.016	0.019	0.023
6. gunite, wavy section	0.018	0.022	0.025
7. on good excavated rock	0.017	0.02	
8. on irregular excavated rock	0.022	0.027	
d. Concrete bottom float finish with sides of:			
1. dressed stone in mortar	0.015	0.017	0.02
2. random stone in mortar	0.017	0.02	0.024
3. cement rubble masonry, plastered	0.016	0.02	0.024
4. cement rubble masonry	0.02	0.025	0.03
5. dry rubble or riprap	0.02	0.03	0.035
e. Gravel bottom with sides of:			
1. formed concrete	0.017	0.02	0.025
2. random stone mortar	0.02	0.023	0.026
3. dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. glazed	0.011	0.013	0.015
2. in cement mortar	0.012	0.015	0.018
g. Masonry			
1. cemented rubble	0.017	0.025	0.03
2. dry rubble	0.023	0.032	0.035
h. Dressed ashlar/stone paving	0.013	0.015	0.017
i. Asphalt			
1. smooth	0.013	0.013	
2. rough	0.016	0.016	
j. Vegetal lining	0.03		0.5

5 Year HFL Points			
S. No.	Right Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770693.76	3332771.19	301.28
2	770719.85	3332728.56	301.17
3	770742.32	3332683.89	301.00
4	770747.63	3332634.24	300.88
5	770763.93	3332587.73	300.78
6	770793.88	3332547.97	300.81
7	770828.36	3332511.78	301.12
8	770863.82	3332476.53	301.36
9	770901.11	3332443.26	301.51
10	770939.16	3332410.83	301.48
11	770977.21	3332378.39	300.66
12	771015.27	3332345.96	300.84
13	771053.71	3332314.03	301.22
14	771094.89	3332285.68	301.57
15	771136.08	3332257.33	301.42
16	771177.48	3332229.29	301.08
17	771218.87	3332201.24	300.80
18	771259.16	3332171.63	300.54
19	771298.43	3332140.70	300.37
20	771338.24	3332110.57	300.13
21	771381.48	3332085.70	300.14
22	771425.77	3332062.64	299.44
23	771466.44	3332033.74	299.58
24	771502.76	3331999.56	299.53
25	771529.79	3331957.85	299.42
26	771558.93	3331917.35	299.37
27	771582.42	3331873.46	299.44
28	771603.13	3331827.95	299.90
29	771625.84	3331783.41	301.15
30	771647.62	3331738.42	300.33
31	771669.68	3331693.55	301.69
32	771694.54	3331650.21	301.90
33	771720.15	3331607.35	302.12
34	771745.87	3331564.50	302.41
35	771762.72	3331517.87	302.20
36	771754.10	3331469.61	301.84
37	771741.70	3331421.20	300.74
38	771736.48	3331371.47	300.86
39	771725.20	3331323.26	301.10
40	771705.81	3331277.21	302.17
41	771681.56	3331233.48	302.16
42	771651.75	3331193.60	301.22
43	771619.17	3331155.70	299.10
44	771581.81	3331122.47	298.63

45	771544.17	3331089.60	298.28
46	771503.03	3331061.18	297.94
47	771459.26	3331037.79	297.50
48	771412.47	3331020.18	297.23
49	771367.33	3330998.68	297.15
50	771322.21	3330977.12	297.03
51	771277.10	3330955.57	296.97
52	771230.55	3330937.32	296.90
53	771184.83	3330917.22	296.81
54	771140.09	3330894.88	296.72
55	771095.36	3330872.55	296.60
56	771050.53	3330850.40	296.50
57	771005.68	3330828.30	296.43
58	770960.83	3330806.21	296.36
59	770914.69	3330786.99	296.43
60	770868.55	3330767.87	296.43
61	770825.63	3330742.21	296.29
62	770782.72	3330716.55	296.09
63	770739.81	3330690.89	295.97
64	770699.16	3330661.77	295.80
65	770658.85	3330632.28	295.70
66	770626.46	3330594.19	295.68
67	770594.07	3330556.10	295.69
68	770560.98	3330518.63	296.31
69	770527.00	3330481.95	296.60
70	770493.42	3330444.92	297.06
71	770461.58	3330406.37	296.91
72	770429.73	3330367.82	297.17
73	770398.19	3330329.03	297.68
74	770366.71	3330290.18	298.19
75	770344.33	3330245.55	298.22
76	770343.67	3330195.82	297.66
77	770345.04	3330145.84	297.07
78	770352.33	3330096.38	296.81
79	770361.96	3330047.47	296.71
80	770376.99	3329999.87	296.66
81	770379.14	3329949.92	296.62
82	770383.50	3329900.19	296.57
83	770393.40	3329851.18	296.53
84	770429.84	3329824.56	296.20
85	770476.82	3329836.37	295.90
86	770525.08	3329848.19	295.72
87	770574.32	3329856.88	295.27
88	770623.56	3329865.56	295.12
89	770672.95	3329873.30	294.90
90	770722.49	3329878.47	294.92
91	770772.43	3329880.86	294.85

92	770822.37	3329883.24	294.44
93	770872.29	3329884.78	293.59
94	770922.21	3329887.70	293.23
95	770971.91	3329886.28	293.00
96	771021.31	3329878.55	292.88
97	771063.30	3329851.97	292.73
98	771098.73	3329817.99	292.60
99	771117.62	3329771.70	292.48
100	771134.81	3329725.04	292.31
101	771130.47	3329675.23	292.13
102	771126.94	3329625.51	291.95
103	771122.86	3329576.06	291.76
104	771116.95	3329526.41	291.60
105	771111.03	3329476.76	291.47
106	771104.75	3329427.17	291.36
107	771077.36	3329386.05	291.27
108	771047.16	3329346.20	291.20
109	771016.96	3329306.35	291.13
110	770984.54	3329268.29	291.05
111	770951.94	3329230.39	291.02
112	770915.45	3329196.53	290.93
113	770876.16	3329165.62	290.89
114	770836.53	3329135.13	290.85
115	770796.59	3329105.04	290.77
116	770756.63	3329075.20	290.64
117	770714.17	3329048.80	290.51
118	770671.84	3329022.19	290.35
119	770637.39	3328986.30	290.22
120	770601.17	3328951.83	290.10
121	770582.95	3328905.54	290.00
122	770564.83	3328858.94	289.90
123	770546.72	3328812.34	289.80
124	770520.80	3328769.92	289.79
125	770491.96	3328729.08	289.69
126	770464.08	3328687.66	289.63
127	770441.48	3328643.05	289.58
128	770418.88	3328598.45	289.50
129	770396.28	3328553.85	289.42
130	770373.68	3328509.25	289.36
131	770351.08	3328464.65	289.35
132	770318.36	3328427.89	289.29
133	770280.85	3328394.82	289.19
134	770243.35	3328361.75	289.05
135	770212.78	3328322.62	288.95
136	770185.00	3328281.05	288.85
137	770157.23	3328239.47	288.79
138	770132.84	3328196.98	288.76

139	770118.24	3328149.24	288.68
140	770103.22	3328101.55	288.58
141	770088.21	3328053.85	288.48
142	770073.20	3328006.16	288.46
143	770058.19	3327958.47	288.27
144	770042.08	3327911.29	288.16
145	770021.09	3327865.91	288.20
146	770001.38	3327820.27	288.51
147	769973.97	3327778.45	288.16
148	769946.57	3327736.63	287.79
149	769928.47	3327691.02	287.53
150	769914.02	3327643.15	287.38
151	769899.58	3327595.28	287.18
152	769875.82	3327551.95	287.03
153	769847.03	3327511.07	286.94
154	769818.24	3327470.19	286.87
155	769789.45	3327429.31	286.82
156	769760.66	3327388.43	286.72
157	769733.56	3327346.41	286.64
158	769706.47	3327304.39	286.47
159	769678.90	3327262.69	286.33
160	769649.69	3327222.11	286.23
161	769620.46	3327181.54	286.13
162	769590.98	3327141.16	286.10
163	769561.50	3327100.77	286.03
164	769534.38	3327058.81	286.01
165	769508.31	3327016.14	286.08
166	769482.25	3326973.47	286.39
167	769455.08	3326931.52	286.82
168	769426.88	3326890.23	287.11
169	769398.69	3326848.93	287.02
170	769370.79	3326807.45	286.39
171	769343.77	3326765.38	285.99
172	769320.82	3326721.71	285.81
173	769312.01	3326672.49	285.64
174	769303.20	3326623.27	285.66
175	769294.39	3326574.06	285.59
176	769275.20	3326528.82	285.53
177	769248.80	3326486.36	285.45
178	769217.68	3326449.09	285.24
179	769172.88	3326426.89	285.11
180	769128.34	3326404.19	284.98
181	769082.52	3326385.46	284.87
182	769033.17	3326377.47	284.74
183	768984.22	3326367.42	284.69
184	768935.97	3326354.42	284.69
185	768887.55	3326342.39	284.69

186	768839.52	3326330.71	284.75
187	768797.06	3326304.30	285.00
188	768764.22	3326267.87	285.53
189	768737.27	3326225.76	285.30
190	768710.70	3326183.41	284.88
191	768684.13	3326141.05	284.80
192	768657.56	3326098.69	284.74
193	768630.99	3326056.34	284.75
194	768605.34	3326013.42	284.66
195	768579.72	3325970.48	284.56
196	768554.10	3325927.54	284.39
197	768528.49	3325884.61	284.24
198	768506.35	3325839.92	284.14
199	768487.21	3325793.73	284.05
200	768468.06	3325747.54	283.90
201	768448.92	3325701.35	283.78
202	768435.42	3325653.70	283.64
203	768429.74	3325604.02	283.44
204	768424.07	3325554.34	283.23
205	768418.39	3325504.67	283.03
206	768412.72	3325454.99	282.86
207	768407.04	3325405.31	282.74
208	768403.08	3325355.51	282.61
209	768401.44	3325305.54	282.58
210	768399.81	3325255.56	282.59
211	768398.17	3325205.59	282.58
212	768396.54	3325155.62	282.56
213	768397.98	3325105.64	282.52
214	768399.50	3325055.66	282.44
215	768401.02	3325005.69	282.34
216	768402.54	3324955.71	282.24
217	768403.45	3324905.72	282.14
218	768404.21	3324855.73	282.04
219	768399.20	3324806.36	282.00
220	768387.77	3324757.68	282.07
221	768377.55	3324708.78	282.03
222	768370.70	3324659.25	282.24
223	768363.85	3324609.72	282.96
224	768372.60	3324561.14	283.00
225	768385.39	3324512.80	283.13
226	768401.23	3324465.47	283.10
227	768419.48	3324418.91	283.17
228	768437.74	3324372.37	283.05
229	768456.02	3324325.83	282.95
230	768474.30	3324279.29	282.88
231	768494.91	3324233.73	282.38
232	768515.51	3324188.17	281.93

233	768529.30	3324140.62	281.72
234	768536.60	3324091.15	281.58
235	768543.90	3324041.69	281.47
236	768546.70	3323992.09	281.36
237	768542.41	3323942.27	281.26
238	768526.46	3323894.98	281.13
239	768517.78	3323846.12	280.96
240	768518.75	3323796.71	280.75
241	768522.29	3323748.44	280.55
242	768506.94	3323700.85	280.48
243	768491.59	3323653.26	280.42
244	768476.28	3323605.67	280.37
245	768471.59	3323555.89	280.43
246	768466.91	3323506.11	280.38
247	768462.23	3323456.33	280.39
248	768456.90	3323406.62	280.28
249	768451.37	3323356.92	280.33
250	768449.35	3323307.35	280.18
251	768458.20	3323258.14	280.06
252	768467.56	3323209.03	279.99
253	768478.58	3323160.26	279.88
254	768487.45	3323111.12	279.81
255	768493.35	3323061.47	279.75
256	768493.30	3323011.61	279.77
257	768490.26	3322961.75	279.73
258	768480.25	3322912.76	279.68
259	768472.55	3322863.48	279.58
260	768470.19	3322813.54	279.48
261	768465.27	3322763.80	279.42
262	768442.56	3322719.87	279.39
263	768429.03	3322671.96	279.36
264	768416.44	3322623.58	279.32
265	768403.25	3322575.35	279.25
266	768390.06	3322527.12	279.16
267	768376.87	3322478.89	279.06
268	768363.10	3322430.82	279.00
269	768349.07	3322382.83	278.95
270	768335.05	3322334.84	278.90
271	768317.99	3322287.84	278.79
272	768300.83	3322240.88	278.67
273	768291.24	3322192.12	278.59
274	768285.41	3322142.46	278.55
275	768276.30	3322093.35	278.54
276	768264.70	3322044.78	278.51
277	768246.01	3321998.40	278.44
278	768227.31	3321952.03	278.41
279	768210.01	3321905.14	278.47

280	768193.68	3321857.88	278.76
281	768177.36	3321810.62	278.32
282	768170.73	3321761.16	278.61
283	768165.05	3321711.48	278.81
284	768151.79	3321663.46	279.17
285	768136.25	3321615.93	279.53
286	768123.99	3321567.53	278.64
287	768113.74	3321518.59	278.99
288	768105.88	3321469.22	278.40
289	768098.72	3321419.84	278.29
290	768112.08	3321371.66	278.31
291	768130.06	3321325.30	278.29
292	768153.05	3321280.89	278.19
293	768194.36	3321253.47	278.11
294	768244.31	3321251.21	277.93
295	768294.12	3321251.01	277.84
296	768343.34	3321259.83	277.79
297	768392.62	3321268.22	277.69
298	768442.32	3321273.63	277.58
299	768492.03	3321279.04	277.53
300	768541.41	3321286.83	277.47
301	768590.79	3321294.65	277.41
302	768640.45	3321300.40	277.36
303	768690.14	3321306.02	277.35
304	768739.84	3321311.50	277.38
305	768789.60	3321316.34	277.45
306	768839.37	3321321.10	277.46
307	768889.04	3321326.80	277.46
308	768938.68	3321332.79	277.42
309	768988.47	3321336.98	277.33
310	769038.43	3321338.86	277.24
311	769088.27	3321337.83	277.15
312	769137.87	3321331.55	277.07
313	769187.47	3321325.26	277.01
314	769237.08	3321318.98	276.94
315	769286.68	3321312.70	276.90
316	769336.29	3321306.42	276.82
317	769385.87	3321300.01	276.70
318	769433.99	3321286.44	276.63
319	769482.11	3321272.86	276.73
320	769530.23	3321259.28	276.81
321	769578.99	3321248.89	276.83
322	769628.63	3321242.97	276.82
323	769678.28	3321237.04	276.80
324	769727.33	3321228.10	276.77
325	769775.47	3321214.58	276.72
326	769823.61	3321201.06	276.65

327	769873.12	3321194.22	276.58
328	769922.68	3321187.64	276.54
329	769972.54	3321186.80	276.52
330	770019.32	3321197.33	276.49
331	770059.08	3321227.65	276.45
332	770104.09	3321248.33	276.41
333	770151.93	3321262.66	276.38
334	770201.03	3321269.23	276.34
335	770249.35	3321259.85	276.30
336	770295.54	3321240.71	276.26
337	770331.54	3321206.23	276.22
338	770359.93	3321165.43	276.18
339	770377.13	3321119.20	276.15
340	770387.60	3321070.31	276.11
341	770387.01	3321020.67	276.07
342	770384.03	3320970.77	276.03
343	770383.56	3320920.78	275.99
344	770374.61	3320872.08	275.95
345	770360.03	3320824.26	275.91
346	770346.00	3320776.27	275.88
347	770332.96	3320728.00	275.84
348	770319.92	3320679.73	275.80
349	770306.88	3320631.46	275.76
350	770283.50	3320587.83	275.72
351	770258.22	3320544.69	275.68
352	770232.94	3320501.55	275.65
353	770212.71	3320455.91	275.61
354	770193.67	3320409.67	275.57
355	770172.35	3320364.48	275.53
356	770150.03	3320319.74	275.49
357	770127.70	3320275.00	275.45
358	770109.11	3320228.60	275.41
359	770090.81	3320182.07	275.38
360	770075.18	3320134.68	275.34
361	770062.95	3320086.20	275.30
362	770053.22	3320037.20	275.26
363	770045.06	3319987.87	275.22
364	770038.14	3319938.38	274.65
365	770033.69	3319888.58	274.38
366	770033.84	3319838.69	274.34
367	770036.49	3319788.76	274.70
368	770039.14	3319738.83	274.23
369	770036.16	3319688.95	274.26
370	770032.71	3319639.07	274.46
371	770029.37	3319589.19	274.56
372	770029.95	3319539.19	274.31
373	770032.74	3319489.34	274.07

374	770039.35	3319439.85	273.77
375	770057.94	3319393.43	273.46
376	770073.94	3319346.07	273.27
377	770089.61	3319298.59	273.16
378	770111.14	3319254.11	273.06
379	770140.47	3319213.61	272.96
380	770167.29	3319171.53	272.89
381	770194.85	3319130.67	272.84
382	770234.33	3319099.99	272.78
383	770280.82	3319086.56	272.73
384	770330.51	3319081.02	272.73
385	770380.31	3319080.65	272.82
386	770430.19	3319084.09	272.91
387	770476.08	3319101.99	273.09
388	770520.64	3319124.66	273.39
389	770568.32	3319139.34	273.62
390	770617.03	3319147.91	273.77
391	770666.53	3319143.79	273.75
392	770712.12	3319123.34	273.66
393	770750.65	3319091.74	273.60
394	770788.81	3319059.47	273.64
395	770826.43	3319026.53	274.27
396	770858.75	3318988.43	274.23
397	770879.03	3318943.43	273.77
398	770895.15	3318896.10	273.92
399	770910.48	3318848.56	273.47
400	770919.74	3318799.43	272.87
401	770925.78	3318750.21	272.72
402	770919.12	3318700.65	272.62
403	770885.01	3318664.94	272.51
404	770845.07	3318635.02	272.43
405	770797.28	3318623.40	272.36
406	770747.67	3318617.41	272.30
407	770697.83	3318613.47	272.29
408	770648.57	3318605.60	272.20
409	770604.30	3318582.37	272.08
410	770571.70	3318544.90	272.00
411	770581.23	3318498.43	271.94
412	770599.25	3318452.27	271.88
413	770630.48	3318413.22	271.84
414	770661.70	3318374.17	271.83
415	770694.65	3318336.70	271.80
416	770730.85	3318302.21	271.78
417	770760.68	3318262.09	271.77
418	770790.32	3318221.82	271.81
419	770819.61	3318181.29	271.82
420	770846.30	3318139.02	271.85

421	770872.81	3318096.63	271.84
422	770899.52	3318054.37	271.83
423	770929.55	3318014.39	271.85
424	770959.12	3317974.14	271.84
425	770980.77	3317929.07	271.73
426	770993.32	3317880.72	271.60
427	770996.09	3317831.17	271.32
428	770995.33	3317781.18	271.13
429	770995.93	3317731.19	271.02
430	770995.96	3317681.19	270.91
431	770993.92	3317631.38	270.79
432	770978.85	3317583.70	270.70
433	770964.10	3317535.93	270.56
434	770949.79	3317488.02	270.42
435	770953.99	3317439.94	270.29
436	770969.84	3317392.65	270.26
437	770990.37	3317347.09	270.25
438	771020.41	3317307.12	270.27
439	771050.78	3317267.43	270.28
440	771085.59	3317231.54	270.30
441	771119.02	3317194.55	270.33
442	771146.35	3317152.68	270.30
443	771171.12	3317109.53	270.24
444	771188.25	3317062.55	270.18
445	771205.38	3317015.58	270.13
446	771219.78	3316967.79	270.08
447	771230.16	3316919.15	269.99
448	771245.84	3316871.67	269.66
449	771268.09	3316826.96	269.33
450	771299.95	3316789.10	269.12
451	771335.59	3316754.03	269.02
452	771376.55	3316726.18	268.84
453	771420.56	3316702.44	268.59
454	771464.55	3316678.68	268.21
455	771510.87	3316672.46	267.91
456	771559.54	3316683.93	267.73
457	771608.55	3316693.61	267.66
458	771658.01	3316700.49	267.62
459	771707.62	3316694.25	267.59
460	771757.39	3316693.99	267.61
461	771807.38	3316695.04	267.62
462	771856.59	3316686.30	267.52
463	771896.57	3316656.50	267.45
464	771920.19	3316612.88	267.42
465	771944.00	3316568.98	267.44
466	771977.74	3316534.44	267.42
467	772022.49	3316512.13	267.49

468	772067.68	3316490.84	267.46
469	772114.60	3316473.58	267.56
470	772160.58	3316455.28	267.63
471	772198.54	3316425.72	267.75
472	772227.19	3316384.75	267.77
473	772255.85	3316343.77	267.69
474	772287.84	3316305.51	267.50
475	772322.17	3316269.16	267.40
476	772356.50	3316232.81	267.32
477	772393.20	3316198.85	267.26
478	772429.89	3316164.89	267.22
479	772466.79	3316131.16	267.13
480	772505.82	3316099.91	267.09
481	772544.85	3316068.66	267.09
482	772586.66	3316041.28	267.11
483	772628.73	3316014.25	267.15
484	772670.80	3315987.23	267.17
485	772711.75	3315958.56	267.05
486	772752.54	3315929.64	266.89
487	772793.32	3315900.71	266.79
488	772834.85	3315872.91	266.70
489	772877.32	3315846.52	266.60
490	772919.96	3315820.40	266.48
491	772963.34	3315795.55	266.34
492	773006.72	3315770.69	266.18
493	773048.44	3315743.13	265.97
494	773085.84	3315710.59	265.82
495	773118.58	3315672.86	265.62
496	773144.97	3315630.39	265.59
497	773164.15	3315584.60	265.49
498	773179.14	3315536.90	265.42
499	773194.14	3315489.20	265.37
500	773207.83	3315441.12	265.30
501	773221.20	3315392.94	265.24
502	773227.33	3315343.45	265.20
503	773230.20	3315293.57	265.13
504	773230.58	3315243.59	265.08
505	773240.11	3315194.51	265.01
506	773257.20	3315147.82	264.95
507	773277.35	3315102.07	264.87
508	773294.86	3315055.24	264.85
509	773312.37	3315008.41	264.83
510	773329.80	3314961.54	264.76
511	773347.20	3314914.67	264.70
512	773364.41	3314867.72	264.69
513	773381.54	3314820.75	264.61
514	773403.63	3314775.94	264.50

515	773424.90	3314730.76	264.43
516	773442.84	3314684.10	264.34
517	773447.13	3314634.31	264.33
518	773451.68	3314584.52	264.26
519	773452.76	3314534.65	264.20
520	773451.42	3314484.67	264.16
521	773450.19	3314434.69	264.17
522	773451.31	3314384.92	264.07
523	773462.61	3314336.22	264.08
524	773473.92	3314287.52	264.06
525	773474.48	3314237.98	264.12
526	773471.22	3314188.09	264.16
527	773469.08	3314138.14	264.14
528	773468.05	3314088.17	264.17
529	773475.76	3314039.19	264.04
530	773493.28	3313992.65	263.97
531	773517.62	3313948.97	263.77
532	773546.73	3313908.59	263.71
533	773583.99	3313876.95	263.99
534	773629.57	3313856.43	263.97
535	773675.84	3313837.48	263.57
536	773723.99	3313825.62	263.46
537	773773.95	3313827.83	263.35
538	773823.72	3313832.56	263.36
539	773873.49	3313837.37	263.42
540	773923.10	3313843.46	263.45
541	773972.60	3313850.53	263.46
542	774022.10	3313857.60	263.45
543	774071.96	3313855.93	263.47
544	774121.71	3313859.00	263.46
545	774171.38	3313864.76	263.41
546	774220.53	3313873.01	263.38
547	774269.23	3313884.34	263.33
548	774317.93	3313895.66	263.27
549	774366.84	3313905.99	263.23
550	774415.89	3313915.70	263.19
551	774465.34	3313923.05	263.14
552	774514.77	3313930.54	263.11
553	774564.03	3313939.11	263.01
554	774612.41	3313950.96	262.90
555	774659.42	3313967.99	262.80
556	774704.55	3313989.16	262.65
557	774748.27	3314013.42	262.57
558	774793.33	3314035.06	262.52
559	774838.57	3314056.37	262.45
560	774882.72	3314079.80	262.43
561	774926.64	3314103.70	262.44

562	774971.82	3314124.89	262.37
563	775018.32	3314143.29	262.30
564	775064.81	3314161.68	262.17
565	775112.74	3314175.61	262.05
566	775161.26	3314187.68	261.94
567	775209.78	3314199.75	261.88
568	775259.16	3314207.50	261.84
569	775308.60	3314215.02	261.84
570	775358.03	3314222.54	261.88
571	775407.35	3314230.69	261.96
572	775456.52	3314239.79	261.97
573	775505.68	3314248.89	261.98
574	775555.34	3314250.17	261.91
575	775605.27	3314247.40	261.86
576	775655.12	3314243.63	261.82
577	775704.88	3314238.78	261.83
578	775754.46	3314232.66	261.81
579	775803.62	3314223.53	261.78
580	775851.36	3314210.80	261.71
581	775893.52	3314183.92	261.60
582	775933.46	3314154.44	261.48
583	775966.73	3314117.12	261.39
584	776004.11	3314083.91	261.30
585	776041.48	3314050.70	261.24
586	776077.58	3314016.15	261.21
587	776112.48	3313980.34	261.22
588	776147.38	3313944.53	261.26
589	776184.35	3313911.00	261.29
590	776223.26	3313879.61	261.32
591	776260.83	3313846.95	261.24
592	776289.62	3313806.07	261.12
593	776318.41	3313765.19	261.00
594	776344.71	3313722.89	260.90
595	776365.19	3313677.28	260.78
596	776385.57	3313631.64	260.67
597	776394.75	3313582.49	260.52
598	776403.93	3313533.34	260.41
599	776412.55	3313484.09	260.32
600	776421.00	3313434.81	260.27
601	776425.91	3313385.17	260.19
602	776427.27	3313335.19	260.15
603	776397.69	3313299.25	260.16
604	776348.26	3313291.73	260.18
605	776298.73	3313286.52	260.10
606	776248.84	3313289.83	260.01
607	776198.92	3313292.76	259.89
608	776149.44	3313289.76	259.77

609	776101.05	3313277.58	259.63
610	776057.11	3313256.03	259.57
611	776027.81	3313216.49	259.55
612	776014.16	3313168.39	259.57
613	776036.28	3313124.45	259.58
614	776059.21	3313080.02	259.52
615	776082.15	3313035.59	259.49
616	776110.34	3312994.63	259.41
617	776142.14	3312956.04	259.38
618	776177.88	3312921.09	259.36
619	776213.67	3312886.17	259.30
620	776258.49	3312864.60	259.22
621	776305.46	3312848.98	259.11
622	776355.14	3312843.30	258.99
623	776402.32	3312827.95	258.85
624	776447.79	3312807.18	258.72
625	776492.64	3312785.08	258.55
626	776537.49	3312762.97	258.33
627	776582.34	3312740.87	258.21
628	776616.98	3312705.45	258.12
629	776649.43	3312667.42	258.00
630	776678.41	3312627.38	257.94
631	776690.99	3312579.18	257.95
632	776688.31	3312529.65	258.01
633	776695.90	3312480.33	258.01
634	776714.87	3312434.07	257.90
635	776733.84	3312387.81	257.85
636	776757.50	3312343.78	257.78
637	776781.40	3312299.86	257.70
638	776803.18	3312254.85	257.60
639	776827.11	3312211.07	257.70
640	776854.72	3312169.39	257.63
641	776878.45	3312125.52	257.49
642	776899.68	3312080.25	257.45
643	776920.91	3312034.98	257.52
644	776940.24	3311988.88	257.54
645	776959.14	3311942.59	257.54
646	776977.51	3311896.09	257.45
647	776995.53	3311849.45	257.33
648	777018.86	3311805.98	257.39
649	777051.37	3311767.99	257.39
650	777085.22	3311731.24	257.22
651	777120.46	3311695.77	257.18
652	777164.10	3311672.28	257.04
653	777210.05	3311653.12	256.92
654	777259.29	3311644.47	256.72
655	777308.54	3311635.80	256.57

656	777357.73	3311626.84	256.59
657	777406.92	3311617.88	256.59
658	777454.46	3311604.48	256.57
659	777497.56	3311579.14	256.53
660	777540.67	3311553.80	256.42
661	777575.37	3311518.78	256.42
662	777604.09	3311478.37	256.36
663	777619.36	3311430.76	256.40
664	777632.43	3311382.89	256.60
665	777628.52	3311333.04	256.49
666	777624.60	3311283.20	256.22
667	777620.59	3311233.36	256.27
668	777610.48	3311184.68	256.30
669	777596.50	3311136.68	256.21
670	777584.96	3311088.10	256.25
671	777580.46	3311038.56	256.34
672	777591.23	3310990.58	256.40
673	777621.58	3310950.85	256.63
674	777660.65	3310919.86	256.44
675	777698.35	3310887.25	256.22
676	777732.98	3310851.19	256.00
677	777772.74	3310821.70	255.73
678	777816.14	3310796.87	255.79
679	777858.07	3310769.88	256.66
680	777897.09	3310738.62	257.28
681	777935.96	3310707.16	257.39
682	777974.72	3310675.58	257.23
683	778013.49	3310644.00	256.81
684	778053.46	3310614.08	256.40
685	778095.43	3310586.91	256.28
686	778137.40	3310559.74	256.13
687	778175.68	3310527.57	255.99
688	778213.96	3310495.40	255.91
689	778254.43	3310466.08	255.91
690	778295.26	3310437.22	255.85
691	778335.11	3310407.17	255.96
692	778371.06	3310372.42	255.92
693	778411.73	3310344.20	255.83
694	778456.26	3310321.48	255.66
695	778501.89	3310301.05	255.43
696	778544.39	3310274.74	254.96
697	778584.47	3310244.94	254.85
698	778623.85	3310214.13	254.79
699	778663.41	3310183.56	254.77
700	778702.46	3310152.35	254.78
701	778741.59	3310121.35	254.88
702	778783.95	3310094.78	254.89

703	778828.64	3310072.37	254.95
704	778872.39	3310048.25	254.99
705	778915.04	3310022.15	255.04
706	778958.14	3309996.81	255.08
707	778995.37	3309963.76	253.89
708	779032.14	3309929.95	254.23
709	779071.28	3309898.84	253.96
710	779110.64	3309868.01	253.72
711	779150.38	3309837.69	253.74
712	779192.49	3309810.73	253.74
713	779233.76	3309782.55	253.75
714	779274.38	3309753.47	253.92
715	779319.66	3309732.26	254.25
716	779364.61	3309710.39	254.67
717	779408.74	3309686.88	254.50
718	779451.05	3309660.36	254.30
719	779492.40	3309632.25	254.12
720	779529.07	3309599.67	253.37
721	779564.12	3309564.02	253.25
722	779599.69	3309528.88	253.19
723	779635.76	3309494.26	253.15
724	779674.40	3309462.73	253.26
725	779714.96	3309433.50	253.32
726	779754.33	3309402.80	253.38
727	779793.03	3309371.15	253.42
728	779834.64	3309343.54	253.46
729	779879.32	3309321.67	253.54
730	779914.96	3309287.49	253.68
731	779950.96	3309252.88	253.71
732	779991.15	3309223.50	253.85
733	780032.98	3309196.11	253.88
734	780077.22	3309172.94	254.03
735	780118.23	3309145.16	254.20
736	780155.40	3309111.72	254.07
737	780194.49	3309080.58	253.76
738	780234.08	3309050.05	253.59
739	780269.95	3309015.26	253.20
740	780305.72	3308980.32	253.05
741	780341.95	3308945.87	253.02
742	780378.26	3308911.49	252.96
743	780414.71	3308877.27	252.97
744	780450.80	3308842.67	253.00
745	780485.50	3308806.67	253.03
746	780522.98	3308773.72	253.06
747	780562.73	3308743.38	253.09
748	780603.37	3308714.28	252.83
749	780644.66	3308686.14	252.70

750	780688.77	3308662.62	252.59
751	780733.02	3308639.34	252.58
752	780777.63	3308616.76	252.62
753	780824.18	3308598.69	252.48
754	780871.25	3308581.82	252.38
755	780917.73	3308563.60	252.35
756	780961.96	3308540.30	252.24
757	781006.20	3308517.00	252.11
758	781049.18	3308491.50	252.05
759	781091.72	3308465.22	252.02
760	781134.26	3308438.94	252.05
761	781178.02	3308414.76	252.22
762	781221.93	3308390.85	252.62
763	781265.47	3308366.28	252.96
764	781308.82	3308341.37	253.06
765	781352.18	3308316.45	253.34
766	781395.53	3308291.54	253.41
767	781438.88	3308266.63	253.47
768	781482.23	3308241.72	253.34
769	781525.95	3308217.46	253.20
770	781569.82	3308193.48	253.06
771	781614.90	3308172.07	253.02
772	781661.40	3308153.68	252.93
773	781707.89	3308135.28	252.72
774	781755.29	3308119.38	252.36
775	781802.78	3308103.76	252.07
776	781850.28	3308088.14	251.62
777	781897.78	3308072.52	251.17
778	781945.27	3308056.89	250.95
779	781993.28	3308043.16	250.84
780	782042.23	3308032.96	250.82
781	782091.17	3308022.76	250.71
782	782140.34	3308013.75	250.68
783	782189.77	3308006.27	250.65
784	782239.21	3307998.79	250.59
785	782288.65	3307991.30	250.56
786	782338.12	3307984.05	250.66
787	782387.60	3307976.87	250.64
788	782437.08	3307969.69	251.11
789	782486.56	3307962.51	251.09
790	782536.33	3307959.14	251.49
791	782586.33	3307959.01	251.50
792	782636.20	3307961.85	251.65
793	782685.99	3307966.35	251.51
794	782735.79	3307970.85	251.14
795	782784.94	3307979.98	251.02
796	782833.19	3307992.63	251.01

797	782880.61	3308008.42	251.07
798	782929.23	3308020.04	250.97
799	782977.99	3308015.61	250.86
800	783012.09	3307981.95	250.91
801	783037.85	3307939.65	250.97
802	783055.19	3307892.75	250.87
803	783072.53	3307845.85	250.85
804	783080.70	3307796.99	250.89
805	783084.13	3307747.11	250.62
806	783083.25	3307697.32	250.78
807	783077.72	3307647.62	250.73
808	783072.19	3307597.93	250.33
809	783064.04	3307548.69	250.25
810	783052.42	3307500.06	250.28
811	783040.80	3307451.43	250.15
812	783028.43	3307403.07	250.16
813	783006.08	3307358.35	250.27
814	782983.73	3307313.62	250.29
815	782961.38	3307268.89	250.43
816	782939.04	3307224.16	250.97
817	782916.69	3307179.44	251.33
818	782894.34	3307134.71	251.49
819	782874.65	3307088.81	251.94
820	782856.66	3307042.16	251.86
821	782838.59	3306995.53	251.93
822	782820.32	3306948.99	252.10
823	782810.49	3306900.46	252.09
824	782806.01	3306850.66	252.02
825	782803.35	3306800.74	251.94
826	782801.98	3306750.84	251.83
827	782815.13	3306702.60	251.60
828	782828.85	3306654.52	251.62
829	782843.01	3306606.57	251.62
830	782857.67	3306558.77	251.52
831	782872.64	3306511.06	251.41
832	782887.50	3306463.32	251.14
833	782902.23	3306415.54	250.80
834	782916.95	3306367.75	250.53
835	782929.41	3306319.33	250.26
836	782941.83	3306270.90	250.01
837	782948.57	3306221.42	249.94
838	782946.86	3306171.87	249.71
839	782929.78	3306125.36	249.54
840	782923.71	3306076.01	249.31
841	782923.52	3306026.14	249.16
842	782926.76	3305976.25	248.95
843	782930.63	3305926.43	248.79

844	782940.14	3305877.35	248.60
845	782953.11	3305829.09	248.46
846	782967.67	3305781.35	248.38
847	782992.84	3305738.14	248.28
848	783023.18	3305698.64	248.24
849	783056.94	3305661.81	248.17
850	783092.69	3305626.85	248.13
851	783131.14	3305594.95	248.16
852	783172.00	3305566.43	248.18
853	783215.85	3305542.41	248.69
854	783256.72	3305513.91	249.49
855	783295.84	3305482.77	249.73
856	783338.41	3305456.73	249.62
857	783381.91	3305432.08	249.56
858	783424.22	3305405.46	249.42
859	783466.25	3305378.37	249.32
860	783508.64	3305351.88	249.28
861	783551.49	3305326.12	249.16
862	783591.35	3305296.07	249.02
863	783630.19	3305264.59	248.97
864	783669.04	3305233.11	248.94
865	783711.29	3305206.44	248.93
866	783753.91	3305180.31	248.94
867	783793.67	3305150.04	249.03
868	783831.42	3305117.55	249.05
869	783863.38	3305079.10	249.01
870	783894.43	3305039.98	249.00
871	783913.36	3304993.70	248.97
872	783933.76	3304948.06	248.98
873	783954.85	3304902.73	249.02
874	783984.44	3304863.57	249.06
875	784021.00	3304829.45	249.11
876	784055.00	3304792.79	249.14
877	784090.26	3304757.44	249.15
878	784131.78	3304730.83	249.03
879	784179.09	3304716.69	248.82
880	784229.08	3304715.81	248.61
881	784279.08	3304714.85	248.41
882	784329.07	3304713.88	248.21
883	784379.06	3304712.91	248.02
884	784429.00	3304713.49	247.96
885	784478.83	3304717.62	247.69
886	784528.53	3304722.94	247.78
887	784578.16	3304729.03	247.64
888	784627.89	3304734.23	247.59
889	784677.67	3304738.91	247.61
890	784727.45	3304743.59	247.66

891	784776.97	3304750.40	247.77
892	784826.68	3304753.98	247.87
893	784876.67	3304752.94	248.01
894	784926.60	3304750.57	248.01
895	784976.52	3304748.24	247.78
896	785026.48	3304746.17	247.40
897	785076.30	3304743.89	247.21
898	785126.30	3304744.12	247.03
899	785176.29	3304744.48	246.83
900	785226.12	3304747.49	246.61
901	785274.68	3304758.81	246.29
902	785314.75	3304787.10	245.59
903	785343.16	3304827.76	245.14
904	785364.96	3304872.65	244.98
905	785383.96	3304918.86	244.88
906	785399.10	3304966.52	245.78
907	785407.92	3305015.26	245.91
908	785409.64	3305065.23	245.62
909	785415.38	3305114.90	245.45
910	785428.00	3305162.91	244.53
911	785445.53	3305209.74	244.44
912	785473.37	3305250.23	244.95
913	785509.33	3305284.28	244.93
914	785553.30	3305307.70	244.89
915	785603.12	3305311.94	245.04
916	785651.88	3305303.60	244.87
917	785700.19	3305290.71	246.00
918	785744.31	3305268.14	246.02
919	785785.36	3305239.77	246.24
920	785824.27	3305208.36	246.42
921	785859.52	3305173.11	246.63
922	785893.62	3305136.61	246.91
923	785920.71	3305094.59	247.20
924	785947.40	3305052.50	247.31
925	785968.25	3305007.05	247.29
926	785986.83	3304961.02	247.20
927	785990.62	3304911.17	247.17
928	785994.41	3304861.31	247.08
929	785996.88	3304811.41	247.05
930	785996.24	3304761.42	247.08
931	785997.99	3304711.48	247.14
932	786001.15	3304661.58	247.26
933	786004.31	3304611.68	247.34
934	786001.54	3304561.77	247.33
935	786010.95	3304513.46	247.31
936	786029.77	3304467.40	247.11
937	786056.15	3304425.03	246.88

938	786087.38	3304385.99	246.67
939	786123.21	3304351.44	246.52
940	786161.59	3304319.39	246.40
941	786194.52	3304282.40	246.27
942	786222.61	3304241.04	246.43
943	786250.60	3304199.62	246.50
944	786277.30	3304157.34	246.27
945	786303.99	3304115.06	246.15
946	786326.91	3304070.91	246.00
947	786344.28	3304024.03	245.74
948	786361.66	3303977.15	245.58
949	786379.04	3303930.26	245.38
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951	786402.75	3303833.59	245.52
952	786410.68	3303784.23	245.74
953	786404.40	3303734.66	245.85
954	786397.24	3303685.23	245.91
955	786378.35	3303639.38	245.93
956	786357.39	3303594.01	245.92
957	786332.62	3303550.58	245.82
958	786303.63	3303509.97	245.81
959	786262.75	3303487.54	245.75
960	786213.45	3303479.21	245.66
961	786173.87	3303451.53	245.72
962	786140.28	3303415.01	245.79
963	786116.13	3303371.23	246.05
964	786091.98	3303327.45	246.21
965	786067.83	3303283.67	246.35
966	786042.81	3303240.38	246.43
967	786017.62	3303197.19	246.48
968	785992.64	3303153.88	246.53
969	785963.10	3303113.80	246.52
970	785930.47	3303075.91	246.48
971	785897.84	3303038.03	246.47
972	785865.21	3303000.14	246.43
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974	785803.33	3302922.03	246.34
975	785779.25	3302878.21	246.25
976	785758.56	3302833.02	246.21
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979	785719.93	3302688.28	245.97
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981	785704.36	3302589.64	246.05
982	785703.00	3302539.66	245.99
983	785704.72	3302489.92	245.95
984	785713.90	3302440.77	245.87

985	785729.41	3302393.29	245.68
986	785745.52	3302345.96	245.45
987	785761.63	3302298.62	245.33
988	785779.86	3302252.12	245.23
989	785800.29	3302206.48	245.09
990	785820.50	3302160.77	244.91
991	785842.25	3302115.75	244.73
992	785864.01	3302070.73	244.46
993	785885.76	3302025.71	244.41
994	785916.05	3301985.96	244.38
995	785946.57	3301946.36	244.28
996	785980.44	3301909.65	244.12
997	786018.63	3301877.94	243.91
998	786062.51	3301855.83	243.77
999	786112.45	3301853.54	243.72
1000	786161.87	3301860.16	243.68
1001	786211.07	3301868.56	243.38
1002	786260.61	3301875.38	242.87
1003	786298.99	3301902.61	243.12
1004	786325.34	3301943.74	243.22
1005	786337.05	3301992.36	243.35
1006	786331.74	3302041.69	243.29
1007	786323.60	3302091.01	242.93
1008	786314.62	3302140.19	242.29
1009	786305.79	3302189.40	244.23
1010	786297.07	3302238.63	244.34
1011	786288.65	3302287.92	244.46
1012	786280.23	3302337.21	244.62
1013	786275.96	3302386.72	244.69
1014	786279.79	3302436.57	244.80
1015	786285.35	3302485.83	244.91
1016	786309.35	3302529.67	244.86
1017	786338.39	3302569.72	244.75
1018	786375.80	3302602.87	244.59
1019	786418.28	3302627.94	244.01
1020	786464.94	3302645.90	243.90
1021	786514.05	3302647.16	243.80
1022	786563.51	3302645.33	243.74
1023	786613.28	3302640.71	243.62
1024	786663.02	3302635.56	243.46
1025	786712.32	3302627.98	243.21
1026	786760.78	3302615.68	243.05
1027	786809.25	3302603.38	242.95
1028	786857.71	3302591.08	242.90
1029	786906.18	3302578.78	241.78
1030	786950.40	3302556.25	242.85
1031	786993.35	3302530.66	243.11

1032	787031.02	3302497.87	243.18
1033	787068.30	3302464.55	242.98
1034	787103.04	3302428.81	242.86
1035	787134.43	3302389.89	241.64
1036	787155.35	3302344.85	241.66
1037	787170.78	3302297.59	241.70
1038	787176.75	3302247.95	242.47
1039	787183.02	3302198.38	242.42
1040	787182.28	3302148.39	242.45
1041	787169.19	3302101.58	242.45
1042	787145.61	3302057.49	242.67
1043	787119.89	3302015.02	242.97
1044	787094.24	3301972.10	243.18
1045	787070.63	3301928.60	243.29
1046	787042.67	3301887.14	243.37
1047	787015.65	3301845.29	243.34
1048	786992.03	3301801.56	243.33
1049	786970.37	3301757.01	243.59
1050	786959.07	3301708.30	244.23
1051	786961.86	3301659.40	243.62
1052	786970.95	3301610.24	243.48
1053	787002.19	3301572.04	243.40
1054	787036.73	3301535.89	243.53
1055	787081.37	3301514.82	243.57
1056	787127.47	3301495.67	243.46
1057	787172.12	3301473.19	243.25
1058	787218.34	3301455.30	243.05
1059	787267.48	3301446.08	243.07
1060	787315.35	3301432.21	243.00
1061	787358.98	3301409.51	242.88
1062	787401.41	3301383.07	242.74
1063	787443.85	3301356.63	242.74
1064	787486.24	3301330.12	242.79
1065	787528.53	3301303.44	242.73
1066	787571.40	3301277.73	242.72
1067	787614.99	3301253.24	242.59
1068	787642.85	3301214.44	242.65
1069	787659.86	3301167.74	242.67
1070	787668.52	3301118.50	242.76
1071	787666.48	3301068.92	242.79
1072	787652.59	3301021.87	242.72
1073	787628.51	3300978.05	242.48
1074	787599.81	3300937.57	241.89
1075	787565.75	3300900.96	241.69
1076	787531.69	3300864.36	241.07
1077	787498.08	3300827.35	240.80
1078	787465.18	3300789.70	241.07

1079	787435.19	3300749.76	241.58
1080	787414.03	3300705.83	241.55
1081	787406.82	3300656.35	243.02
1082	787430.98	3300620.42	242.41
1083	787471.94	3300591.75	242.61
1084	787512.66	3300562.77	242.69
1085	787555.51	3300537.01	242.75
1086	787595.28	3300507.63	242.73
1087	787623.94	3300466.66	242.68
1088	787652.61	3300425.69	242.70
1089	787681.27	3300384.72	242.77
1090	787709.93	3300343.75	242.79
1091	787738.59	3300302.78	242.80
1092	787757.96	3300256.74	242.91
1093	787776.85	3300210.45	242.94
1094	787789.97	3300162.98	242.97
1095	787789.29	3300112.98	242.94
1096	787789.33	3300063.27	242.90
1097	787790.38	3300013.78	242.91
1098	787799.51	3299964.62	242.73
1099	787808.79	3299915.49	242.47
1100	787818.07	3299866.36	242.14
1101	787827.71	3299817.35	242.03
1102	787849.32	3299772.26	239.39
1103	787870.93	3299727.17	239.51
1104	787885.97	3299679.70	240.58
1105	787898.56	3299631.32	241.68
1106	787908.43	3299582.31	241.54
1107	787904.29	3299532.90	241.47
1108	787896.47	3299483.59	241.26
1109	787879.01	3299436.74	241.04
1110	787861.02	3299390.09	240.15
1111	787843.02	3299343.43	239.57
1112	787818.67	3299300.59	239.21
1113	787786.07	3299262.67	239.70
1114	787751.49	3299226.83	239.11
1115	787712.36	3299195.69	241.63
1116	787673.24	3299164.56	241.81
1117	787634.50	3299132.98	241.89
1118	787597.53	3299099.31	242.06
1119	787560.57	3299065.63	242.15
1120	787522.96	3299032.69	242.24
1121	787485.64	3298999.43	242.33
1122	787447.32	3298967.48	242.37
1123	787409.09	3298935.25	242.35
1124	787369.96	3298904.20	242.20
1125	787328.91	3298875.66	242.08

1126	787287.85	3298847.12	241.93
1127	787247.27	3298817.92	241.91
1128	787206.83	3298788.51	241.65
1129	787166.00	3298759.65	241.19
1130	787125.03	3298731.00	240.60
1131	787084.05	3298702.34	239.49
1132	787044.39	3298671.90	239.47
1133	787004.85	3298641.30	240.36
1134	786965.32	3298610.69	240.94
1135	786926.16	3298579.61	239.71
1136	786887.91	3298547.41	238.33
1137	786849.66	3298515.21	239.21
1138	786811.46	3298483.25	241.27
1139	786774.46	3298449.63	240.49
1140	786737.45	3298416.00	241.37
1141	786700.45	3298382.38	241.39
1142	786663.44	3298348.75	241.45
1143	786627.90	3298313.67	241.41
1144	786594.49	3298276.47	241.46
1145	786561.08	3298239.27	241.45
1146	786526.70	3298202.98	241.44
1147	786491.94	3298167.04	241.45
1148	786453.08	3298136.02	241.40
1149	786412.93	3298106.23	241.41
1150	786380.93	3298069.30	241.35
1151	786351.54	3298028.85	241.21
1152	786327.03	3297985.75	241.13
1153	786306.45	3297940.18	241.09
1154	786284.74	3297895.87	241.10
1155	786259.35	3297852.80	241.08
1156	786244.73	3297806.68	241.03
1157	786238.29	3297757.09	241.00
1158	786231.84	3297707.51	241.02
1159	786228.03	3297657.79	241.08
1160	786229.84	3297607.82	241.14
1161	786231.64	3297557.86	241.17
1162	786235.06	3297508.22	241.14
1163	786249.67	3297460.47	241.08
1164	786262.75	3297412.21	241.02
1165	786280.82	3297365.84	240.86
1166	786299.63	3297319.51	240.71
1167	786318.44	3297273.18	240.52
1168	786334.03	3297225.83	240.44
1169	786345.36	3297177.13	240.51
1170	786355.10	3297128.22	240.61
1171	786356.87	3297078.26	240.70
1172	786353.56	3297028.63	240.71

1173	786345.10	3296979.35	240.64
1174	786334.03	3296930.59	240.52
1175	786327.06	3296881.27	240.39
1176	786324.60	3296831.33	240.34
1177	786322.12	3296781.40	240.12
1178	786319.63	3296731.46	240.35
1179	786326.26	3296682.78	240.51
1180	786348.00	3296639.78	240.56
1181	786392.08	3296617.32	240.67
1182	786441.46	3296625.16	240.49
1183	786489.89	3296637.00	240.42
1184	786538.93	3296646.36	240.45
1185	786588.72	3296650.45	240.52
1186	786638.30	3296655.57	240.58
1187	786688.27	3296655.87	240.63
1188	786735.62	3296670.07	240.60
1189	786782.18	3296688.31	240.56
1190	786828.73	3296706.55	240.43
1191	786877.76	3296708.80	240.21
1192	786927.65	3296705.49	240.10
1193	786977.54	3296702.18	240.07
1194	787023.83	3296689.84	240.02
1195	787062.30	3296657.90	239.98
1196	787100.77	3296625.96	240.02
1197	787139.24	3296594.02	238.68
1198	787160.99	3296549.58	237.87
1199	787180.75	3296503.65	239.80
1200	787200.29	3296457.65	239.95
1201	787212.73	3296409.22	239.94
1202	787225.17	3296360.79	239.93
1203	787237.62	3296312.36	240.01
1204	787272.62	3296280.24	237.79
1205	787314.70	3296253.25	240.35

5 Year HFL Points			
S. No.	Left Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770521.23	3332679.19	301.28
2	770542.97	3332634.17	301.17
3	770564.71	3332589.14	301.00
4	770589.09	3332545.61	300.88
5	770616.70	3332503.93	300.78
6	770656.78	3332478.13	300.81
7	770703.84	3332461.25	301.12
8	770751.83	3332447.20	301.36
9	770794.86	3332422.47	301.51
10	770835.15	3332393.01	301.48
11	770873.36	3332360.76	300.66
12	770911.57	3332328.51	300.84
13	770949.35	3332295.76	301.22
14	770986.82	3332262.66	301.57
15	771025.05	3332230.48	301.42
16	771064.91	3332200.29	301.08
17	771105.33	3332170.92	300.80
18	771147.91	3332144.72	300.54
19	771188.90	3332116.18	300.37
20	771228.91	3332086.19	300.13
21	771268.92	3332056.20	300.14
22	771309.70	3332027.27	299.44
23	771350.50	3331998.37	299.58
24	771389.45	3331967.01	299.53
25	771427.83	3331935.11	299.42
26	771458.10	3331895.31	299.37
27	771483.98	3331853.10	299.44
28	771503.94	3331807.26	299.90
29	771520.89	3331760.22	301.15
30	771537.77	3331713.16	300.33
31	771554.64	3331666.09	301.69
32	771574.62	3331620.29	301.90
33	771595.62	3331574.92	302.12
34	771616.86	3331529.65	302.41
35	771638.15	3331484.42	302.20
36	771646.55	3331435.52	301.84
37	771649.87	3331385.77	300.74
38	771647.02	3331335.85	300.86
39	771631.10	3331290.17	301.10
40	771604.10	3331248.08	302.17
41	771572.00	3331211.16	302.16
42	771529.64	3331184.60	301.22
43	771487.27	3331158.04	299.10
44	771445.77	3331130.19	298.63

45	771404.78	3331101.56	298.28
46	771359.16	3331081.16	297.94
47	771313.39	3331061.02	297.50
48	771267.63	3331040.89	297.23
49	771222.03	3331020.37	297.15
50	771176.47	3330999.77	297.03
51	771130.45	3330980.24	296.97
52	771084.28	3330961.04	296.90
53	771038.34	3330941.35	296.81
54	770993.93	3330918.39	296.72
55	770949.51	3330895.43	296.60
56	770905.05	3330872.57	296.50
57	770858.84	3330853.48	296.43
58	770812.63	3330834.38	296.36
59	770768.81	3330810.56	296.43
60	770726.32	3330784.22	296.43
61	770684.16	3330757.33	296.29
62	770644.55	3330727.20	296.09
63	770608.34	3330692.72	295.97
64	770573.91	3330656.48	295.80
65	770539.77	3330619.95	295.70
66	770505.26	3330583.76	295.68
67	770470.76	3330547.57	295.69
68	770437.59	3330510.19	296.31
69	770405.23	3330472.08	296.60
70	770372.86	3330433.97	297.06
71	770341.98	3330394.69	296.91
72	770312.82	3330354.07	297.17
73	770283.67	3330313.46	297.68
74	770261.07	3330269.67	298.19
75	770247.38	3330221.58	298.22
76	770241.98	3330172.30	297.66
77	770241.63	3330122.31	297.07
78	770241.76	3330072.33	296.81
79	770246.74	3330022.58	296.71
80	770251.72	3329972.83	296.66
81	770256.70	3329923.08	296.62
82	770266.12	3329874.38	296.57
83	770284.15	3329827.75	296.53
84	770302.18	3329781.11	296.20
85	770322.12	3329735.35	295.90
86	770345.79	3329691.31	295.72
87	770368.33	3329646.69	295.27
88	770390.17	3329601.71	295.12
89	770409.93	3329555.84	294.90
90	770427.62	3329509.07	294.92
91	770445.31	3329462.31	294.85

92	770458.80	3329414.23	294.44
93	770470.85	3329365.70	293.59
94	770464.31	3329316.80	293.23
95	770440.10	3329273.60	293.00
96	770406.47	3329236.59	292.88
97	770372.85	3329199.58	292.73
98	770339.23	3329162.58	292.60
99	770305.61	3329125.57	292.48
100	770271.99	3329088.56	292.31
101	770239.53	3329050.59	292.13
102	770209.52	3329010.60	291.95
103	770179.51	3328970.60	291.76
104	770149.50	3328930.61	291.60
105	770122.40	3328888.62	291.47
106	770095.79	3328846.29	291.36
107	770069.18	3328803.96	291.27
108	770042.57	3328761.62	291.20
109	770015.96	3328719.29	291.13
110	769996.17	3328673.38	291.05
111	769976.44	3328627.44	291.02
112	769956.71	3328581.50	290.93
113	769936.99	3328535.55	290.89
114	769917.26	3328489.61	290.85
115	769897.53	3328443.67	290.77
116	769874.13	3328399.48	290.64
117	769850.74	3328355.29	290.51
118	769828.77	3328310.49	290.35
119	769812.98	3328263.05	290.22
120	769797.19	3328215.61	290.10
121	769781.40	3328168.17	290.00
122	769764.73	3328121.03	289.90
123	769747.40	3328074.13	289.80
124	769730.07	3328027.23	289.79
125	769718.68	3327978.58	289.69
126	769707.74	3327929.79	289.63
127	769696.80	3327881.00	289.58
128	769688.83	3327831.69	289.50
129	769682.56	3327782.09	289.42
130	769669.87	3327734.34	289.36
131	769648.64	3327689.07	289.35
132	769627.41	3327643.81	289.29
133	769607.92	3327597.77	289.19
134	769588.60	3327551.65	289.05
135	769569.29	3327505.53	288.95
136	769549.98	3327459.41	288.85
137	769524.18	3327416.71	288.79
138	769497.03	3327374.72	288.76

139	769469.91	3327332.72	288.68
140	769442.83	3327290.69	288.58
141	769415.74	3327248.66	288.48
142	769388.66	3327206.62	288.46
143	769357.76	3327167.61	288.27
144	769323.19	3327131.48	288.16
145	769288.63	3327095.35	288.20
146	769257.74	3327056.22	288.51
147	769229.31	3327015.10	288.16
148	769200.87	3326973.97	287.79
149	769172.44	3326932.84	287.53
150	769144.01	3326891.71	287.38
151	769115.85	3326850.39	287.18
152	769087.69	3326809.08	287.03
153	769059.53	3326767.76	286.94
154	769022.76	3326733.93	286.87
155	768985.78	3326700.27	286.82
156	768947.97	3326667.58	286.72
157	768909.27	3326635.92	286.64
158	768888.20	3326590.94	286.47
159	768868.31	3326545.07	286.33
160	768849.03	3326498.93	286.23
161	768829.76	3326452.79	286.13
162	768785.03	3326433.04	286.10
163	768740.42	3326410.99	286.03
164	768697.92	3326384.64	286.01
165	768655.43	3326358.30	286.08
166	768615.65	3326329.34	286.39
167	768591.04	3326285.82	286.82
168	768569.41	3326241.22	287.11
169	768560.50	3326192.02	287.02
170	768551.59	3326142.82	286.39
171	768535.08	3326096.34	285.99
172	768510.70	3326052.69	285.81
173	768486.28	3326009.06	285.64
174	768460.93	3325965.96	285.66
175	768435.58	3325922.86	285.59
176	768410.23	3325879.76	285.53
177	768383.14	3325837.77	285.45
178	768355.08	3325796.38	285.24
179	768327.03	3325754.99	285.11
180	768301.26	3325712.43	284.98
181	768283.90	3325665.54	284.87
182	768266.54	3325618.65	284.74
183	768254.49	3325570.57	284.69
184	768250.12	3325520.76	284.69
185	768245.74	3325470.95	284.69

186	768241.37	3325421.14	284.75
187	768236.99	3325371.34	285.00
188	768232.95	3325321.51	285.53
189	768232.43	3325271.51	285.30
190	768231.90	3325221.52	284.88
191	768231.38	3325171.52	284.80
192	768230.85	3325121.52	284.74
193	768230.33	3325071.52	284.75
194	768229.81	3325021.53	284.66
195	768229.28	3324971.53	284.56
196	768228.57	3324921.53	284.39
197	768227.85	3324871.54	284.24
198	768227.14	3324821.55	284.14
199	768219.77	3324772.13	284.05
200	768211.85	3324722.76	283.90
201	768204.76	3324673.27	283.78
202	768200.01	3324624.00	283.64
203	768217.12	3324577.02	283.44
204	768234.22	3324530.03	283.23
205	768251.33	3324483.05	283.03
206	768268.22	3324435.99	282.86
207	768284.78	3324388.81	282.74
208	768302.33	3324342.05	282.61
209	768324.47	3324297.22	282.58
210	768346.61	3324252.39	282.59
211	768368.75	3324207.56	282.58
212	768386.56	3324160.88	282.56
213	768403.70	3324113.90	282.52
214	768420.83	3324066.93	282.44
215	768429.94	3324018.24	282.34
216	768433.53	3323968.37	282.24
217	768437.12	3323918.50	282.14
218	768427.76	3323869.47	282.04
219	768417.74	3323820.49	282.00
220	768407.72	3323771.50	282.07
221	768397.70	3323722.51	282.03
222	768384.49	3323674.61	282.24
223	768362.56	3323629.68	282.96
224	768342.59	3323583.92	283.00
225	768325.63	3323536.88	283.13
226	768308.73	3323489.83	283.10
227	768292.05	3323442.69	283.17
228	768288.40	3323395.30	283.05
229	768303.28	3323347.57	282.95
230	768310.55	3323298.27	282.88
231	768309.59	3323248.82	282.38
232	768299.81	3323199.79	281.93

233	768290.88	3323150.60	281.72
234	768282.74	3323101.27	281.58
235	768274.60	3323051.94	281.47
236	768270.35	3323002.16	281.36
237	768267.29	3322952.26	281.26
238	768267.30	3322902.43	281.13
239	768272.91	3322852.75	280.96
240	768291.96	3322806.86	280.75
241	768313.35	3322761.67	280.55
242	768330.77	3322716.36	280.48
243	768325.42	3322666.64	280.42
244	768320.08	3322616.93	280.37
245	768314.73	3322567.22	280.43
246	768302.35	3322519.08	280.38
247	768285.92	3322471.86	280.39
248	768269.49	3322424.64	280.28
249	768254.52	3322376.96	280.33
250	768235.84	3322331.09	280.18
251	768209.36	3322288.68	280.06
252	768185.85	3322244.62	279.99
253	768163.20	3322200.08	279.88
254	768138.82	3322156.48	279.81
255	768119.68	3322110.52	279.75
256	768120.00	3322060.52	279.77
257	768110.86	3322011.80	279.73
258	768089.53	3321967.08	279.68
259	768058.11	3321928.85	279.58
260	768020.91	3321895.44	279.48
261	767998.55	3321851.43	279.42
262	767995.51	3321801.52	279.39
263	768000.30	3321751.94	279.36
264	768008.17	3321702.58	279.32
265	768019.34	3321653.85	279.25
266	768030.02	3321605.22	279.16
267	768015.14	3321560.19	279.06
268	767990.02	3321516.98	279.00
269	767961.06	3321476.60	278.95
270	767928.14	3321438.98	278.90
271	767896.42	3321400.35	278.79
272	767860.36	3321365.71	278.67
273	767824.82	3321330.54	278.59
274	767790.93	3321293.81	278.55
275	767772.80	3321249.11	278.54
276	767786.72	3321202.50	278.51
277	767820.26	3321165.86	278.44
278	767861.23	3321137.26	278.41
279	767907.35	3321117.95	278.47

280	767955.17	3321103.52	278.76
281	768003.34	3321090.11	278.32
282	768053.15	3321088.27	278.61
283	768103.13	3321087.85	278.81
284	768151.94	3321098.74	279.17
285	768200.74	3321109.62	279.53
286	768247.49	3321126.78	278.64
287	768294.78	3321142.83	278.99
288	768342.76	3321156.74	278.40
289	768392.11	3321164.77	278.29
290	768441.51	3321169.68	278.31
291	768491.42	3321172.70	278.29
292	768541.33	3321175.71	278.19
293	768591.24	3321178.72	278.11
294	768641.10	3321182.30	277.93
295	768690.82	3321187.61	277.84
296	768740.53	3321192.93	277.79
297	768790.25	3321198.24	277.69
298	768840.18	3321199.44	277.58
299	768890.17	3321199.22	277.53
300	768940.17	3321199.22	277.47
301	768990.00	3321203.32	277.41
302	769039.79	3321206.69	277.36
303	769088.92	3321197.39	277.35
304	769138.04	3321188.08	277.38
305	769186.79	3321177.11	277.45
306	769235.07	3321164.12	277.46
307	769283.46	3321151.54	277.46
308	769332.40	3321141.32	277.42
309	769381.34	3321131.11	277.33
310	769430.29	3321120.89	277.24
311	769479.20	3321110.51	277.15
312	769528.01	3321099.69	277.07
313	769576.83	3321088.87	277.01
314	769625.64	3321078.04	276.94
315	769674.18	3321066.18	276.90
316	769722.01	3321051.59	276.82
317	769769.98	3321037.88	276.70
318	769819.94	3321035.80	276.63
319	769869.89	3321036.14	276.73
320	769919.83	3321038.62	276.81
321	769969.76	3321041.10	276.83
322	770019.53	3321045.80	276.82
323	770069.30	3321050.52	276.80
324	770119.18	3321053.96	276.77
325	770169.05	3321052.97	276.72
326	770199.60	3321016.35	276.65

327	770212.17	3320969.22	276.58
328	770217.58	3320919.51	276.54
329	770208.30	3320871.21	276.52
330	770193.60	3320823.42	276.49
331	770178.91	3320775.62	276.45
332	770164.21	3320727.83	276.41
333	770149.51	3320680.04	276.38
334	770133.56	3320632.75	276.34
335	770111.71	3320587.77	276.30
336	770089.86	3320542.80	276.26
337	770068.01	3320497.83	276.22
338	770046.16	3320452.85	276.18
339	770024.70	3320407.74	276.15
340	770011.67	3320359.46	276.11
341	769998.64	3320311.19	276.07
342	769985.83	3320262.86	276.03
343	769974.09	3320214.26	275.99
344	769962.35	3320165.66	275.95
345	769950.61	3320117.06	275.91
346	769938.86	3320068.45	275.88
347	769934.52	3320018.66	275.84
348	769930.38	3319968.83	275.80
349	769926.25	3319919.00	275.76
350	769923.71	3319869.12	275.72
351	769924.67	3319819.13	275.68
352	769925.63	3319769.14	275.65
353	769926.15	3319719.18	275.61
354	769918.23	3319669.81	275.57
355	769910.30	3319620.44	275.53
356	769902.38	3319571.08	275.49
357	769902.36	3319521.27	275.45
358	769904.78	3319471.33	275.41
359	769909.26	3319421.79	275.38
360	769925.68	3319374.56	275.34
361	769940.88	3319326.99	275.30
362	769951.59	3319278.15	275.26
363	769964.01	3319229.97	275.22
364	769988.82	3319186.56	274.65
365	770013.99	3319143.38	274.38
366	770043.53	3319103.04	274.34
367	770073.08	3319062.71	274.70
368	770112.52	3319033.31	274.23
369	770155.62	3319007.97	274.26
370	770200.57	3318988.09	274.46
371	770250.20	3318982.05	274.56
372	770299.97	3318977.44	274.31
373	770349.87	3318974.29	274.07

374	770399.77	3318971.19	273.77
375	770449.35	3318977.68	273.46
376	770499.04	3318983.09	273.27
377	770548.84	3318984.59	273.16
378	770598.65	3318980.20	273.06
379	770644.24	3318961.74	272.96
380	770683.37	3318931.33	272.89
381	770716.81	3318894.97	272.84
382	770733.73	3318847.92	272.78
383	770723.77	3318800.68	272.73
384	770698.36	3318764.71	272.73
385	770648.73	3318758.62	272.82
386	770599.07	3318753.11	272.91
387	770549.09	3318754.23	273.09
388	770499.35	3318751.80	273.39
389	770450.02	3318743.63	273.62
390	770400.69	3318735.46	273.77
391	770354.07	3318720.45	273.75
392	770312.46	3318692.72	273.66
393	770270.86	3318664.98	273.60
394	770238.41	3318631.66	273.64
395	770232.72	3318581.99	274.27
396	770244.29	3318533.74	274.23
397	770262.03	3318487.58	273.77
398	770290.92	3318446.77	273.92
399	770319.81	3318405.96	273.47
400	770354.39	3318371.03	272.87
401	770396.10	3318343.46	272.72
402	770437.81	3318315.88	272.62
403	770479.46	3318288.22	272.51
404	770518.18	3318256.59	272.43
405	770556.91	3318224.96	272.36
406	770594.56	3318192.47	272.30
407	770629.44	3318156.64	272.29
408	770664.31	3318120.81	272.20
409	770699.19	3318084.98	272.08
410	770729.26	3318045.39	272.00
411	770755.69	3318002.95	271.94
412	770782.13	3317960.51	271.88
413	770807.20	3317917.27	271.84
414	770831.07	3317873.34	271.83
415	770838.71	3317825.58	271.80
416	770836.57	3317775.63	271.78
417	770833.51	3317725.72	271.77
418	770830.45	3317675.82	271.81
419	770827.38	3317625.91	271.82
420	770824.06	3317576.02	271.85

421	770820.36	3317526.16	271.84
422	770820.74	3317476.24	271.83
423	770823.08	3317426.29	271.85
424	770833.76	3317378.19	271.84
425	770852.64	3317331.89	271.73
426	770876.60	3317288.18	271.60
427	770902.92	3317245.67	271.32
428	770929.25	3317203.16	271.13
429	770957.92	3317162.24	271.02
430	770987.65	3317122.04	270.91
431	771017.38	3317081.84	270.79
432	771046.73	3317041.36	270.70
433	771075.98	3317000.80	270.56
434	771107.64	3316962.19	270.42
435	771132.32	3316919.85	270.29
436	771148.66	3316872.60	270.26
437	771166.70	3316825.97	270.25
438	771184.75	3316779.34	270.27
439	771202.79	3316732.71	270.28
440	771232.41	3316692.76	270.30
441	771263.74	3316653.79	270.33
442	771297.79	3316617.21	270.30
443	771332.41	3316581.14	270.24
444	771372.37	3316552.04	270.18
445	771416.24	3316528.06	270.13
446	771461.15	3316506.22	270.08
447	771508.74	3316499.45	269.99
448	771557.01	3316512.05	269.66
449	771603.07	3316531.40	269.33
450	771650.59	3316544.95	269.12
451	771699.73	3316542.25	269.02
452	771746.56	3316525.80	268.84
453	771785.13	3316494.07	268.59
454	771820.65	3316458.93	268.21
455	771851.65	3316419.84	267.91
456	771876.91	3316376.81	267.73
457	771896.85	3316331.02	267.66
458	771924.54	3316289.61	267.62
459	771953.13	3316248.91	267.59
460	771976.07	3316204.49	267.61
461	771999.93	3316160.72	267.62
462	772034.90	3316124.98	267.52
463	772069.86	3316089.25	267.45
464	772108.19	3316057.37	267.42
465	772148.49	3316027.78	267.44
466	772188.79	3315998.19	267.42
467	772225.31	3315964.11	267.49

468	772261.20	3315929.30	267.46
469	772301.18	3315899.60	267.56
470	772343.42	3315872.84	267.63
471	772380.28	3315839.26	267.75
472	772415.65	3315803.92	267.77
473	772454.95	3315773.41	267.69
474	772497.00	3315746.36	267.50
475	772539.71	3315720.48	267.40
476	772582.41	3315694.45	267.32
477	772625.10	3315668.43	267.26
478	772667.62	3315642.13	267.22
479	772709.48	3315614.79	267.13
480	772751.35	3315587.45	267.09
481	772794.05	3315561.44	267.09
482	772837.51	3315536.80	267.11
483	772881.75	3315513.52	267.15
484	772923.54	3315486.46	267.17
485	772962.87	3315455.58	267.05
486	773000.71	3315423.02	266.89
487	773034.69	3315386.65	266.79
488	773060.65	3315343.92	266.70
489	773085.66	3315300.67	266.60
490	773107.37	3315255.63	266.48
491	773128.15	3315210.15	266.34
492	773143.45	3315162.73	266.18
493	773149.19	3315113.69	265.97
494	773145.80	3315063.81	265.82
495	773142.40	3315013.92	265.62
496	773139.01	3314964.04	265.59
497	773137.53	3314914.07	265.49
498	773136.54	3314864.08	265.42
499	773135.54	3314814.09	265.37
500	773136.35	3314764.12	265.30
501	773138.30	3314714.16	265.24
502	773140.26	3314664.19	265.20
503	773142.21	3314614.23	265.13
504	773144.17	3314564.27	265.08
505	773151.86	3314514.87	265.01
506	773159.59	3314465.47	264.95
507	773167.31	3314416.07	264.87
508	773175.21	3314366.70	264.85
509	773183.51	3314317.39	264.83
510	773191.80	3314268.08	264.76
511	773200.09	3314218.78	264.70
512	773211.67	3314170.20	264.69
513	773225.08	3314122.03	264.61
514	773238.48	3314073.86	264.50

515	773248.84	3314024.97	264.43
516	773258.29	3313975.87	264.34
517	773268.57	3313926.99	264.33
518	773283.44	3313879.25	264.26
519	773299.52	3313832.06	264.20
520	773325.90	3313789.59	264.16
521	773354.81	3313749.78	264.17
522	773398.53	3313725.50	264.07
523	773444.39	3313708.40	264.08
524	773494.25	3313704.67	264.06
525	773544.11	3313700.93	264.12
526	773594.06	3313701.45	264.16
527	773644.03	3313703.03	264.14
528	773694.01	3313704.60	264.17
529	773743.98	3313706.18	264.04
530	773793.96	3313707.76	263.97
531	773843.16	3313715.50	263.77
532	773891.99	3313726.29	263.71
533	773940.81	3313737.08	263.99
534	773989.63	3313747.87	263.97
535	774038.68	3313757.43	263.57
536	774088.06	3313765.30	263.46
537	774137.44	3313773.17	263.35
538	774186.92	3313779.31	263.36
539	774236.88	3313777.30	263.42
540	774286.84	3313775.29	263.45
541	774336.70	3313771.80	263.46
542	774386.53	3313767.61	263.45
543	774436.35	3313763.41	263.47
544	774486.17	3313759.21	263.46
545	774536.00	3313755.01	263.41
546	774585.82	3313752.48	263.38
547	774635.63	3313756.85	263.33
548	774685.44	3313761.22	263.27
549	774734.74	3313768.97	263.23
550	774783.63	3313779.43	263.19
551	774832.80	3313788.06	263.14
552	774882.61	3313792.44	263.11
553	774932.42	3313796.82	263.01
554	774982.22	3313801.21	262.90
555	775032.08	3313804.85	262.80
556	775082.03	3313807.10	262.65
557	775131.98	3313809.36	262.57
558	775181.93	3313811.62	262.52
559	775231.71	3313815.99	262.45
560	775281.40	3313821.54	262.43
561	775331.11	3313826.92	262.44

562	775380.92	3313831.26	262.37
563	775430.73	3313835.61	262.30
564	775480.54	3313839.96	262.17
565	775530.35	3313844.30	262.05
566	775580.29	3313846.03	261.94
567	775630.29	3313846.38	261.88
568	775680.28	3313846.74	261.84
569	775730.28	3313847.09	261.84
570	775780.28	3313847.38	261.88
571	775830.28	3313847.66	261.96
572	775879.13	3313839.25	261.97
573	775927.35	3313826.01	261.98
574	775970.38	3313800.95	261.91
575	776013.55	3313775.72	261.86
576	776047.95	3313739.49	261.82
577	776082.20	3313703.06	261.83
578	776108.36	3313661.00	261.81
579	776128.11	3313615.38	261.78
580	776136.86	3313566.27	261.71
581	776124.61	3313518.83	261.60
582	776094.52	3313478.89	261.48
583	776050.37	3313455.48	261.39
584	776009.41	3313426.93	261.30
585	775971.97	3313393.90	261.24
586	775935.62	3313359.57	261.21
587	775899.43	3313325.11	261.22
588	775874.37	3313281.85	261.26
589	775849.30	3313238.59	261.29
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591	775837.85	3313142.90	261.24
592	775847.73	3313094.06	261.12
593	775859.97	3313045.58	261.00
594	775875.39	3312998.09	260.90
595	775892.76	3312951.20	260.78
596	775915.33	3312907.37	260.67
597	775947.73	3312869.29	260.52
598	775979.77	3312830.91	260.41
599	776010.88	3312791.76	260.32
600	776042.13	3312752.77	260.27
601	776084.21	3312725.77	260.19
602	776126.59	3312699.38	260.15
603	776173.65	3312682.50	260.16
604	776220.44	3312664.97	260.18
605	776265.22	3312642.72	260.10
606	776310.00	3312620.47	260.01
607	776352.55	3312594.46	259.89
608	776393.14	3312565.42	259.77

609	776425.49	3312527.30	259.63
610	776456.71	3312488.25	259.57
611	776487.48	3312448.84	259.55
612	776518.10	3312409.31	259.57
613	776548.72	3312369.78	259.58
614	776579.46	3312330.36	259.52
615	776610.82	3312291.41	259.49
616	776642.18	3312252.47	259.41
617	776673.47	3312213.47	259.38
618	776703.57	3312173.55	259.36
619	776733.68	3312133.63	259.30
620	776746.81	3312085.39	259.22
621	776760.11	3312037.20	259.11
622	776776.36	3311989.92	258.99
623	776792.62	3311942.63	258.85
624	776808.87	3311895.35	258.72
625	776820.63	3311846.90	258.55
626	776829.47	3311797.68	258.33
627	776838.54	3311748.52	258.21
628	776849.41	3311699.71	258.12
629	776865.88	3311653.37	258.00
630	776894.45	3311612.33	257.94
631	776923.01	3311571.29	257.95
632	776951.57	3311530.25	258.01
633	776984.67	3311493.28	258.01
634	777022.44	3311460.53	257.90
635	777060.21	3311427.77	257.85
636	777097.12	3311394.05	257.78
637	777133.69	3311359.94	257.70
638	777170.25	3311325.84	257.60
639	777206.81	3311291.73	257.70
640	777242.11	3311256.36	257.63
641	777276.34	3311219.91	257.49
642	777310.57	3311183.47	257.45
643	777341.49	3311144.20	257.52
644	777372.11	3311104.67	257.54
645	777406.75	3311068.63	257.54
646	777438.50	3311030.14	257.45
647	777459.33	3310985.49	257.33
648	777473.49	3310937.54	257.39
649	777489.00	3310890.86	257.39
650	777518.68	3310850.62	257.22
651	777548.35	3310810.37	257.18
652	777585.17	3310777.07	257.04
653	777624.94	3310746.89	256.92
654	777669.79	3310724.79	256.72
655	777714.64	3310702.70	256.57

656	777756.17	3310674.92	256.59
657	777797.39	3310646.62	256.59
658	777838.73	3310618.50	256.57
659	777881.28	3310592.25	256.53
660	777923.84	3310566.00	256.42
661	777967.27	3310541.22	256.42
662	778010.71	3310516.46	256.36
663	778053.09	3310489.99	256.40
664	778094.62	3310462.15	256.60
665	778134.57	3310432.11	256.49
666	778171.88	3310399.00	256.22
667	778207.08	3310363.48	256.27
668	778242.42	3310328.12	256.30
669	778277.89	3310292.87	256.21
670	778319.88	3310265.77	256.25
671	778362.12	3310239.02	256.34
672	778404.65	3310212.73	256.40
673	778448.45	3310188.95	256.63
674	778494.82	3310170.26	256.44
675	778540.34	3310149.60	256.22
676	778585.35	3310127.82	256.00
677	778627.02	3310100.73	255.73
678	778660.93	3310064.85	255.79
679	778687.88	3310022.74	256.66
680	778717.96	3309982.91	257.28
681	778750.17	3309944.66	257.39
682	778786.95	3309911.30	257.23
683	778828.00	3309882.77	256.81
684	778869.64	3309855.10	256.40
685	778911.29	3309827.43	256.28
686	778952.94	3309799.76	256.13
687	778995.74	3309774.18	255.99
688	779041.29	3309753.56	255.91
689	779077.42	3309719.21	255.91
690	779112.71	3309683.79	255.85
691	779147.89	3309648.26	255.96
692	779183.64	3309613.31	255.92
693	779220.25	3309579.29	255.83
694	779258.40	3309546.97	255.66
695	779296.02	3309514.09	255.43
696	779330.37	3309477.76	254.96
697	779364.72	3309441.43	254.85
698	779400.73	3309406.76	254.79
699	779437.20	3309372.56	254.77
700	779473.77	3309338.49	254.78
701	779509.50	3309303.52	254.88
702	779545.76	3309269.09	254.89

703	779582.15	3309234.80	254.95
704	779621.17	3309203.55	254.99
705	779659.74	3309171.76	255.04
706	779696.79	3309138.19	255.08
707	779735.47	3309106.79	253.89
708	779778.21	3309080.85	254.23
709	779821.70	3309056.57	253.96
710	779869.52	3309042.00	253.72
711	779917.35	3309027.42	253.74
712	779959.83	3309002.27	253.74
713	779998.31	3308970.58	253.75
714	780037.73	3308939.82	253.92
715	780077.15	3308909.06	254.25
716	780119.77	3308883.71	254.67
717	780165.97	3308864.58	254.50
718	780209.49	3308841.28	254.30
719	780253.66	3308818.08	254.12
720	780296.09	3308791.63	253.37
721	780338.53	3308765.19	253.25
722	780383.80	3308744.92	253.19
723	780429.82	3308726.14	253.15
724	780472.85	3308700.68	253.26
725	780515.06	3308673.88	253.32
726	780559.80	3308651.70	253.38
727	780602.88	3308626.55	253.42
728	780644.71	3308599.16	253.46
729	780688.00	3308574.31	253.54
730	780732.73	3308551.96	253.68
731	780776.71	3308528.26	253.71
732	780819.59	3308502.54	253.85
733	780861.82	3308475.81	253.88
734	780903.11	3308447.61	254.03
735	780944.98	3308420.33	254.20
736	780988.12	3308395.05	254.07
737	781031.26	3308369.78	253.76
738	781074.40	3308344.50	253.59
739	781117.54	3308319.22	253.20
740	781160.26	3308293.24	253.05
741	781202.62	3308266.69	253.02
742	781244.99	3308240.14	252.96
743	781287.36	3308213.58	252.97
744	781329.81	3308188.31	253.00
745	781373.93	3308164.78	253.03
746	781418.05	3308141.25	253.06
747	781462.17	3308117.73	253.09
748	781506.29	3308094.20	252.83
749	781550.41	3308070.67	252.70

750	781593.06	3308044.74	252.59
751	781634.23	3308016.35	252.58
752	781675.42	3307988.03	252.62
753	781719.70	3307964.80	252.48
754	781763.83	3307941.29	252.38
755	781807.94	3307917.75	252.35
756	781854.82	3307900.56	252.24
757	781902.08	3307884.23	252.11
758	781947.37	3307863.06	252.05
759	781994.11	3307846.16	252.02
760	782042.94	3307835.40	252.05
761	782090.27	3307819.44	252.22
762	782137.33	3307802.55	252.62
763	782184.21	3307785.18	252.96
764	782231.83	3307769.92	253.06
765	782279.45	3307754.67	253.34
766	782327.06	3307739.42	253.41
767	782374.68	3307724.17	253.47
768	782424.01	3307717.65	253.34
769	782473.86	3307713.74	253.20
770	782523.71	3307709.83	253.06
771	782573.56	3307705.92	253.02
772	782615.05	3307680.72	252.93
773	782654.26	3307649.70	252.72
774	782693.47	3307618.67	252.36
775	782732.68	3307587.65	252.07
776	782761.32	3307546.87	251.62
777	782789.11	3307505.30	251.17
778	782802.73	3307458.70	250.95
779	782807.34	3307408.92	250.84
780	782803.39	3307359.47	250.82
781	782794.64	3307310.27	250.71
782	782773.19	3307265.11	250.68
783	782751.74	3307219.94	250.65
784	782729.87	3307174.98	250.59
785	782707.52	3307130.25	250.56
786	782684.87	3307085.68	250.66
787	782666.79	3307039.08	250.64
788	782648.95	3306992.37	251.11
789	782631.87	3306945.46	251.09
790	782625.10	3306895.92	251.49
791	782615.94	3306846.80	251.50
792	782612.39	3306797.75	251.65
793	782620.77	3306748.46	251.51
794	782630.68	3306699.47	251.14
795	782641.58	3306650.67	251.02
796	782651.39	3306601.66	251.01

797	782659.62	3306552.34	251.07
798	782671.60	3306503.96	250.97
799	782687.65	3306456.61	250.86
800	782703.71	3306409.26	250.91
801	782717.48	3306361.32	250.97
802	782726.21	3306312.09	250.87
803	782734.94	3306262.86	250.85
804	782741.68	3306213.32	250.89
805	782742.95	3306164.12	250.62
806	782729.57	3306115.94	250.78
807	782717.93	3306067.39	250.73
808	782710.26	3306017.98	250.33
809	782703.53	3305968.44	250.25
810	782697.06	3305918.86	250.28
811	782702.09	3305869.31	250.15
812	782710.88	3305820.17	250.16
813	782723.12	3305771.69	250.27
814	782735.94	3305723.36	250.29
815	782748.76	3305675.03	250.43
816	782761.57	3305626.70	250.97
817	782774.39	3305578.37	251.33
818	782795.74	3305533.71	251.49
819	782821.99	3305491.15	251.94
820	782848.24	3305448.60	251.86
821	782875.52	3305406.80	251.93
822	782908.15	3305368.91	252.10
823	782940.77	3305331.02	252.09
824	782973.39	3305293.13	252.02
825	783007.79	3305257.86	251.94
826	783047.90	3305228.01	251.83
827	783088.02	3305198.16	251.60
828	783128.13	3305168.31	251.62
829	783166.11	3305136.15	251.62
830	783202.95	3305102.34	251.52
831	783239.79	3305068.54	251.41
832	783276.63	3305034.73	251.14
833	783316.30	3305004.89	250.80
834	783360.25	3304981.06	250.53
835	783404.21	3304957.23	250.26
836	783448.16	3304933.39	250.01
837	783492.12	3304909.56	249.94
838	783537.74	3304889.38	249.71
839	783584.56	3304871.85	249.54
840	783631.20	3304853.88	249.31
841	783676.62	3304832.97	249.16
842	783722.04	3304812.07	248.95
843	783767.46	3304791.16	248.79

844	783810.51	3304765.85	248.60
845	783847.95	3304733.61	248.46
846	783880.00	3304695.24	248.38
847	783914.40	3304659.64	248.28
848	783952.89	3304627.73	248.24
849	783991.38	3304595.82	248.17
850	784029.87	3304563.91	248.13
851	784075.85	3304547.34	248.16
852	784124.69	3304536.66	248.18
853	784173.31	3304525.04	248.69
854	784221.60	3304512.92	249.49
855	784271.36	3304517.79	249.73
856	784321.12	3304522.66	249.62
857	784370.49	3304530.29	249.56
858	784419.61	3304539.63	249.42
859	784469.54	3304539.76	249.32
860	784519.53	3304539.17	249.28
861	784569.53	3304538.57	249.16
862	784619.53	3304537.98	249.02
863	784669.51	3304537.00	248.97
864	784719.47	3304534.81	248.94
865	784769.14	3304537.17	248.93
866	784818.45	3304545.43	248.94
867	784868.05	3304551.20	249.03
868	784917.96	3304554.19	249.05
869	784967.87	3304557.05	249.01
870	785017.83	3304559.13	249.00
871	785067.79	3304561.20	248.97
872	785117.71	3304559.52	248.98
873	785167.61	3304556.46	249.02
874	785217.51	3304559.42	249.06
875	785267.41	3304562.58	249.11
876	785317.32	3304565.73	249.14
877	785367.26	3304568.02	249.15
878	785417.21	3304570.32	249.03
879	785467.16	3304572.62	248.82
880	785516.56	3304580.25	248.61
881	785565.93	3304588.16	248.41
882	785614.19	3304600.97	248.21
883	785662.19	3304614.98	248.02
884	785709.39	3304599.58	247.96
885	785756.56	3304582.99	247.69
886	785789.42	3304547.89	247.78
887	785817.37	3304506.43	247.64
888	785832.75	3304460.12	247.59
889	785839.89	3304410.63	247.61
890	785841.90	3304360.77	247.66

891	785842.05	3304310.77	247.77
892	785842.20	3304260.77	247.87
893	785848.00	3304211.68	248.01
894	785863.55	3304164.16	248.01
895	785882.44	3304118.05	247.78
896	785905.69	3304073.78	247.40
897	785928.94	3304029.52	247.21
898	785954.16	3303986.35	247.03
899	785979.81	3303943.44	246.83
900	786018.24	3303911.55	246.61
901	786056.27	3303879.10	246.29
902	786090.21	3303843.55	245.59
903	786108.49	3303797.01	245.14
904	786108.89	3303748.35	244.98
905	786102.00	3303698.83	244.88
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908	786067.82	3303553.50	245.62
909	786046.41	3303508.44	245.45
910	786021.86	3303464.89	244.53
911	785993.91	3303423.89	244.44
912	785958.80	3303388.28	244.95
913	785923.70	3303352.68	244.93
914	785886.08	3303319.77	244.89
915	785851.73	3303283.84	245.04
916	785821.76	3303243.81	244.87
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923	785600.67	3302977.25	247.20
924	785576.88	3302933.27	247.31
925	785559.12	3302886.55	247.29
926	785541.20	3302839.88	247.20
927	785521.36	3302793.98	247.17
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929	785505.04	3302696.06	247.05
930	785501.21	3302646.28	247.08
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933	785509.47	3302496.64	247.34
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942	785636.58	3302068.03	246.43
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946	785727.83	3301890.06	246.00
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948	785784.20	3301808.04	245.58
949	785815.22	3301768.83	245.38
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951	785899.17	3301715.64	245.52
952	785943.80	3301693.09	245.74
953	785992.59	3301684.64	245.85
954	786042.33	3301679.57	245.91
955	786092.16	3301675.45	245.93
956	786141.99	3301671.32	245.92
957	786191.95	3301669.22	245.82
958	786241.90	3301667.13	245.81
959	786291.50	3301672.13	245.75
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961	786380.07	3301714.84	245.72
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988	786823.42	3301463.15	245.23
989	786861.06	3301430.82	245.09
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991	786941.23	3301371.05	244.73
992	786980.50	3301340.10	244.46
993	787023.03	3301314.01	244.41
994	787066.52	3301289.34	244.38
995	787111.06	3301267.50	244.28
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1039	787722.81	3299594.29	242.42
1040	787725.25	3299544.48	242.45
1041	787721.60	3299495.15	242.45
1042	787704.55	3299448.15	242.67
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1052	787336.88	3299111.76	243.48
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1062	786959.14	3298784.18	242.74
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1067	786766.81	3298624.48	242.59
1068	786728.32	3298592.56	242.65
1069	786689.83	3298560.65	242.67
1070	786651.34	3298528.73	242.76
1071	786613.57	3298495.97	242.79
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1073	786538.51	3298429.90	242.48
1074	786500.98	3298396.87	241.89
1075	786463.44	3298363.83	241.69
1076	786425.91	3298330.79	241.07
1077	786388.38	3298297.76	240.80
1078	786350.85	3298264.72	241.07

1079	786315.71	3298229.47	241.58
1080	786285.61	3298189.55	241.55
1081	786256.87	3298148.66	243.02
1082	786229.65	3298106.72	242.41
1083	786202.43	3298064.78	242.61
1084	786178.21	3298021.11	242.69
1085	786155.41	3297976.61	242.75
1086	786132.60	3297932.11	242.73
1087	786109.80	3297887.62	242.68
1088	786086.89	3297843.17	242.70
1089	786063.75	3297798.85	242.77
1090	786040.60	3297754.53	242.79
1091	786016.77	3297710.58	242.80
1092	785992.77	3297666.71	242.91
1093	785985.32	3297618.07	242.94
1094	785982.20	3297568.16	242.97
1095	785981.66	3297518.30	242.94
1096	785986.70	3297468.55	242.90
1097	785991.73	3297418.81	242.91
1098	785999.80	3297369.84	242.73
1099	786026.14	3297327.36	242.47
1100	786052.62	3297284.94	242.14
1101	786081.44	3297244.42	242.03
1102	786117.28	3297209.55	239.39
1103	786145.05	3297169.09	239.51
1104	786165.16	3297123.31	240.58
1105	786181.46	3297076.42	241.68
1106	786189.31	3297027.04	241.54
1107	786184.80	3296977.48	241.47
1108	786175.63	3296928.48	241.26
1109	786161.30	3296880.58	241.04
1110	786151.09	3296831.76	240.15
1111	786143.85	3296782.29	239.57
1112	786151.55	3296733.27	239.21
1113	786161.78	3296684.32	239.70
1114	786171.01	3296635.19	239.11
1115	786184.63	3296587.54	241.63
1116	786206.76	3296542.71	241.81
1117	786233.92	3296500.92	241.89
1118	786261.27	3296459.07	242.06
1119	786288.62	3296417.21	242.15
1120	786320.99	3296382.16	242.24
1121	786369.06	3296368.43	242.33
1122	786417.14	3296354.70	242.37
1123	786465.55	3296342.67	242.35
1124	786515.28	3296337.52	242.20
1125	786565.02	3296332.36	242.08

1126	786614.75	3296327.20	241.93
1127	786664.63	3296324.23	241.91
1128	786714.61	3296322.68	241.65
1129	786764.58	3296321.14	241.19
1130	786813.34	3296314.31	240.60
1131	786858.98	3296293.87	239.49
1132	786899.40	3296266.28	239.47
1133	786932.91	3296229.16	240.36
1134	786966.41	3296192.05	240.94
1135	786999.92	3296154.94	239.71
1136	787025.48	3296112.47	238.33
1137	787047.29	3296067.48	239.21
1138	787069.10	3296022.49	241.27
1139	787090.91	3295977.49	240.49
1140	787107.77	3295930.74	241.37
1141	787119.29	3295882.08	241.39
1142	787130.81	3295833.43	241.45
1143	787137.55	3295784.02	241.41
1144	787141.59	3295734.18	241.46
1145	787145.62	3295684.35	241.45
1146	787146.96	3295634.39	241.44
1147	787147.40	3295584.39	241.45
1148	787149.59	3295534.68	241.40
1149	787159.71	3295485.73	241.41
1150	787169.63	3295436.72	241.35
1151	787179.54	3295387.72	241.21
1152	787199.92	3295343.18	241.13
1153	787232.81	3295305.52	241.09
1154	787265.70	3295267.86	241.10
1155	787306.04	3295240.95	241.08
1156	787352.84	3295223.33	241.03
1157	787399.63	3295205.71	241.00
1158	787448.37	3295198.17	241.02
1159	787498.36	3295197.11	241.08
1160	787547.68	3295191.40	241.14
1161	787595.95	3295178.36	241.17
1162	787644.22	3295165.32	241.14
1163	787678.96	3295131.44	241.08
1164	787710.51	3295092.66	241.02
1165	787722.19	3295047.52	240.86
1166	787718.97	3294997.63	240.71
1167	787709.49	3294951.44	240.52
1168	787667.24	3294924.70	240.44
1169	787624.99	3294897.97	240.51
1170	787582.74	3294871.23	240.61
1171	787540.48	3294844.50	240.70
1172	787496.26	3294821.47	240.71

1173	787450.45	3294801.44	240.64
1174	787404.64	3294781.40	240.52
1175	787358.50	3294762.16	240.39
1176	787312.14	3294743.46	240.34
1177	787266.57	3294723.29	240.12
1178	787217.00	3294729.84	240.35
1179	787168.79	3294741.99	240.51
1180	787121.72	3294758.84	240.56
1181	787074.64	3294775.69	240.67
1182	787027.57	3294792.54	240.49
1183	786981.31	3294811.30	240.42
1184	786936.67	3294833.82	240.45
1185	786891.82	3294855.90	240.52
1186	786846.64	3294877.33	240.58
1187	786801.46	3294898.75	240.63
1188	786756.28	3294920.18	240.60
1189	786710.05	3294938.95	240.56
1190	786662.48	3294954.33	240.43
1191	786614.90	3294969.72	240.21
1192	786567.22	3294984.68	240.10
1193	786518.40	3294995.51	240.07
1194	786469.40	3295005.38	240.02
1195	786420.11	3295013.80	239.98
1196	786370.63	3295019.77	240.02
1197	786320.64	3295019.24	238.68
1198	786270.64	3295018.71	237.87
1199	786222.51	3295005.26	239.80
1200	786174.43	3294991.53	239.95
1201	786127.03	3294975.64	239.94
1202	786079.91	3294959.05	239.93
1203	786035.16	3294936.74	240.01
1204	785995.86	3294909.30	237.79
1205	785976.27	3294863.30	240.35

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RASTERVA X Y

25 Year HFL Points			
S. No.	Right Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770600.74	3332762.78	301.61
2	770588.85	3332756.20	301.98
3	770544.91	3332732.49	303.96
4	770502.93	3332705.33	303.85
5	770495.06	3332668.64	303.89
6	770511.01	3332622.14	304.66
7	770534.87	3332578.77	303.66
8	770558.45	3332534.74	303.33
9	770582.66	3332491.85	304.12
10	770618.15	3332457.83	301.02
11	770657.52	3332427.76	302.26
12	770705.27	3332427.55	303.13
13	770754.20	3332423.22	302.05
14	770796.70	3332397.12	301.88
15	770836.54	3332367.17	301.81
16	770876.52	3332337.16	302.19
17	770905.11	3332296.14	301.62
18	770934.72	3332256.17	301.33
19	770976.38	3332228.51	301.34
20	771018.03	3332200.86	300.90
21	771059.37	3332172.73	300.74
22	771100.65	3332144.51	300.97
23	771140.83	3332114.77	301.24
24	771180.78	3332084.70	301.54
25	771220.64	3332054.53	301.82
26	771260.49	3332024.33	301.80
27	771300.20	3331993.94	301.96
28	771338.90	3331962.28	302.08
29	771377.60	3331930.63	301.88
30	771416.31	3331898.97	301.66
31	771452.52	3331865.09	301.50
32	771470.35	3331820.02	301.09
33	771483.95	3331773.95	300.56
34	771504.53	3331728.66	300.06
35	771519.36	3331681.18	300.03
36	771542.34	3331637.45	299.63
37	771568.04	3331596.94	301.87
38	771585.22	3331549.98	301.76
39	771605.78	3331507.84	300.80
40	771621.60	3331460.94	301.18
41	771621.91	3331411.06	300.41
42	771620.97	3331361.07	300.04
43	771616.52	3331311.58	300.35
44	771600.89	3331264.56	301.08

45	771571.06	3331224.43	300.90
46	771526.78	3331202.07	300.56
47	771479.89	3331184.96	300.51
48	771432.76	3331168.51	300.98
49	771388.09	3331146.05	300.84
50	771343.43	3331123.58	300.31
51	771298.76	3331101.11	299.46
52	771254.09	3331078.64	298.38
53	771209.42	3331056.17	298.07
54	771164.58	3331034.09	297.64
55	771118.94	3331013.65	297.46
56	771072.71	3330994.66	297.45
57	771026.09	3330976.59	297.30
58	770979.83	3330957.92	297.19
59	770936.60	3330932.80	297.16
60	770893.36	3330907.69	297.18
61	770850.13	3330882.57	296.85
62	770808.47	3330854.94	296.69
63	770767.04	3330826.96	296.55
64	770725.60	3330798.97	296.43
65	770684.17	3330770.99	296.29
66	770644.55	3330740.64	296.17
67	770606.97	3330707.66	296.05
68	770571.08	3330672.97	295.89
69	770537.62	3330635.81	295.80
70	770504.17	3330598.66	295.70
71	770471.24	3330561.04	295.62
72	770438.66	3330523.11	295.55
73	770406.20	3330485.08	295.51
74	770373.91	3330446.90	295.49
75	770341.70	3330408.66	295.48
76	770310.17	3330369.85	295.52
77	770278.97	3330330.81	295.70
78	770252.06	3330288.67	296.43
79	770236.65	3330241.71	297.30
80	770227.60	3330192.68	296.34
81	770225.82	3330142.72	296.48
82	770225.43	3330092.79	296.34
83	770230.22	3330043.02	296.80
84	770235.12	3329993.26	297.41
85	770240.57	3329943.56	297.36
86	770249.22	3329894.45	297.38
87	770262.02	3329846.12	296.08
88	770279.08	3329799.29	294.64
89	770299.31	3329753.57	294.40
90	770318.32	3329707.33	294.41
91	770347.01	3329666.67	294.43

92	770367.29	3329621.17	294.47
93	770385.13	3329574.48	294.49
94	770401.93	3329527.42	294.47
95	770416.58	3329479.63	294.42
96	770433.58	3329432.61	294.44
97	770450.75	3329385.75	294.50
98	770447.69	3329336.25	294.64
99	770424.03	3329293.81	294.69
100	770392.69	3329254.86	294.71
101	770359.74	3329217.28	294.68
102	770325.77	3329180.60	294.64
103	770291.80	3329143.90	294.68
104	770257.89	3329107.17	294.69
105	770223.97	3329070.43	294.83
106	770192.51	3329031.61	294.80
107	770161.82	3328992.14	294.45
108	770132.46	3328951.74	294.41
109	770104.14	3328910.53	294.19
110	770076.02	3328869.19	294.07
111	770048.81	3328827.24	294.05
112	770023.11	3328784.43	294.17
113	770000.43	3328739.86	294.37
114	769979.17	3328694.64	294.46
115	769959.47	3328648.68	294.52
116	769939.77	3328602.73	294.51
117	769920.60	3328556.55	294.37
118	769902.18	3328510.07	294.24
119	769882.13	3328464.35	294.11
120	769858.15	3328420.48	293.97
121	769834.17	3328376.60	293.79
122	769816.70	3328329.79	293.60
123	769799.66	3328282.78	293.49
124	769782.61	3328235.78	293.44
125	769765.57	3328188.77	293.34
126	769748.52	3328141.77	293.18
127	769729.87	3328095.38	293.02
128	769711.07	3328049.05	292.85
129	769699.80	3328000.43	292.74
130	769689.66	3327951.47	292.63
131	769679.52	3327902.51	292.51
132	769669.22	3327853.59	292.38
133	769657.64	3327804.94	292.20
134	769646.07	3327756.30	292.02
135	769634.49	3327707.66	291.89
136	769616.01	3327661.28	291.69
137	769596.59	3327615.20	291.48
138	769576.33	3327569.50	291.37

139	769555.27	3327524.15	291.27
140	769534.21	3327478.80	291.18
141	769510.36	3327434.88	291.09
142	769485.91	3327391.27	290.99
143	769461.45	3327347.66	290.86
144	769432.60	3327306.97	290.77
145	769401.91	3327267.49	290.68
146	769371.23	3327228.01	290.57
147	769340.74	3327188.39	290.50
148	769310.53	3327148.55	290.38
149	769280.67	3327108.44	290.23
150	769250.98	3327068.21	290.09
151	769220.47	3327028.66	289.89
152	769186.47	3326991.99	289.76
153	769154.58	3326953.52	289.63
154	769123.86	3326914.10	289.60
155	769095.94	3326872.61	289.58
156	769067.23	3326831.70	289.43
157	769037.08	3326791.81	289.26
158	768990.63	3326780.71	289.10
159	768944.48	3326763.81	288.93
160	768907.45	3326732.59	288.79
161	768879.93	3326690.85	288.68
162	768854.49	3326647.80	288.60
163	768837.51	3326601.06	288.54
164	768824.76	3326552.85	288.51
165	768819.84	3326503.09	288.48
166	768789.06	3326465.42	288.42
167	768744.73	3326444.22	288.34
168	768698.69	3326424.93	288.25
169	768653.97	3326402.57	288.18
170	768614.09	3326372.58	288.09
171	768576.33	3326340.61	287.97
172	768561.83	3326292.76	287.85
173	768548.25	3326244.64	287.77
174	768534.66	3326196.52	287.72
175	768520.14	3326148.68	287.66
176	768504.67	3326101.17	287.62
177	768486.05	3326054.76	287.63
178	768467.00	3326008.54	287.67
179	768446.77	3325962.81	287.68
180	768421.85	3325919.86	287.67
181	768391.58	3325880.06	287.62
182	768362.07	3325839.71	287.53
183	768333.12	3325798.94	287.43
184	768304.67	3325757.83	287.32
185	768274.72	3325717.83	287.18

186	768246.96	3325676.48	287.09
187	768226.56	3325631.10	287.01
188	768213.72	3325582.97	286.93
189	768213.37	3325532.97	286.84
190	768213.02	3325482.97	286.74
191	768212.68	3325432.98	286.56
192	768212.33	3325382.98	286.32
193	768211.98	3325332.98	286.17
194	768211.64	3325282.98	286.09
195	768211.29	3325232.98	286.02
196	768210.90	3325182.98	285.95
197	768209.46	3325133.01	285.88
198	768210.18	3325083.04	285.82
199	768208.79	3325033.06	285.75
200	768208.31	3324983.06	285.65
201	768208.75	3324933.09	285.56
202	768208.42	3324883.10	285.45
203	768207.37	3324833.15	285.34
204	768182.64	3324791.69	285.24
205	768177.28	3324741.99	285.14
206	768174.12	3324692.10	285.04
207	768172.70	3324642.12	284.96
208	768184.08	3324594.46	284.91
209	768200.14	3324547.26	284.84
210	768212.77	3324498.89	284.79
211	768228.00	3324451.33	284.69
212	768249.50	3324406.19	284.60
213	768273.28	3324362.25	284.49
214	768298.34	3324318.98	284.38
215	768318.71	3324273.40	284.29
216	768337.83	3324227.20	284.22
217	768357.27	3324181.13	284.10
218	768374.92	3324134.38	284.00
219	768391.20	3324087.10	283.93
220	768405.60	3324039.27	283.84
221	768411.07	3323989.57	283.74
222	768414.87	3323939.93	283.63
223	768405.99	3323890.72	283.55
224	768400.07	3323841.10	283.48
225	768393.48	3323791.57	283.46
226	768384.57	3323742.37	283.46
227	768369.75	3323695.06	283.45
228	768348.43	3323649.84	283.39
229	768328.63	3323603.94	283.27
230	768309.60	3323557.70	283.15
231	768292.60	3323510.78	283.04
232	768279.67	3323462.48	283.06

233	768274.65	3323413.81	283.25
234	768283.04	3323364.52	283.50
235	768286.67	3323314.73	283.62
236	768284.82	3323265.04	283.63
237	768275.91	3323215.84	283.55
238	768268.14	3323166.46	283.52
239	768261.47	3323116.91	283.48
240	768254.89	3323067.34	283.36
241	768248.35	3323017.77	283.15
242	768245.99	3322967.84	282.93
243	768243.62	3322917.91	282.75
244	768239.97	3322868.04	282.52
245	768257.45	3322822.18	282.42
246	768279.12	3322777.13	282.28
247	768305.16	3322736.25	282.11
248	768312.59	3322690.60	281.93
249	768307.76	3322640.83	281.86
250	768301.81	3322591.26	281.80
251	768289.88	3322542.70	281.78
252	768277.03	3322494.43	281.85
253	768259.67	3322447.54	281.86
254	768242.32	3322400.65	281.86
255	768224.97	3322353.76	281.83
256	768203.65	3322308.78	281.65
257	768177.84	3322265.95	281.52
258	768152.15	3322223.09	281.44
259	768122.03	3322183.19	281.38
260	768106.55	3322138.46	281.33
261	768107.11	3322088.47	281.29
262	768095.45	3322040.14	281.52
263	768081.47	3321992.14	281.52
264	768054.73	3321951.08	281.77
265	768018.99	3321916.78	281.80
266	767980.93	3321886.24	281.81
267	767964.51	3321840.73	281.77
268	767971.86	3321791.27	281.91
269	767980.76	3321742.12	281.86
270	767993.01	3321693.65	281.66
271	768005.26	3321645.17	281.50
272	768007.61	3321595.34	281.40
273	767989.90	3321550.11	281.42
274	767964.11	3321507.36	281.27
275	767933.83	3321467.57	281.13
276	767902.70	3321428.49	281.06
277	767868.88	3321391.67	280.95
278	767833.76	3321356.21	280.79
279	767795.16	3321324.44	280.59

280	767756.55	3321292.66	280.41
281	767746.89	3321244.62	280.24
282	767763.35	3321197.66	280.10
283	767793.95	3321158.34	279.99
284	767835.21	3321130.11	279.91
285	767879.72	3321107.47	279.82
286	767925.83	3321088.23	279.77
287	767973.24	3321072.88	279.73
288	768022.52	3321066.49	279.67
289	768072.36	3321070.46	279.62
290	768122.19	3321074.56	279.60
291	768170.98	3321085.46	279.52
292	768219.37	3321097.92	279.41
293	768267.49	3321111.39	279.29
294	768316.13	3321122.81	279.16
295	768362.54	3321140.37	279.01
296	768412.29	3321145.33	278.85
297	768461.84	3321151.99	278.72
298	768511.66	3321155.52	278.66
299	768561.63	3321157.31	278.63
300	768611.60	3321155.73	278.66
301	768661.58	3321154.14	278.66
302	768711.55	3321152.54	278.61
303	768761.53	3321150.94	278.49
304	768811.50	3321149.35	278.41
305	768861.47	3321147.70	278.30
306	768910.91	3321140.20	278.20
307	768960.34	3321132.70	278.13
308	769009.77	3321125.20	278.06
309	769058.92	3321116.61	277.98
310	769105.59	3321098.66	277.96
311	769152.25	3321080.71	277.88
312	769198.92	3321062.76	277.83
313	769245.58	3321044.80	277.76
314	769292.25	3321026.85	277.67
315	769338.92	3321008.90	277.58
316	769386.13	3320992.61	277.48
317	769434.33	3320979.31	277.43
318	769482.53	3320966.01	277.41
319	769530.72	3320952.71	277.41
320	769578.92	3320939.40	277.40
321	769627.12	3320926.10	277.39
322	769675.32	3320912.80	277.32
323	769718.89	3320888.59	277.26
324	769761.94	3320863.16	277.22
325	769804.98	3320837.73	277.17
326	769843.37	3320805.94	277.14

327	769880.55	3320772.51	277.17
328	769912.20	3320735.05	277.22
329	769931.89	3320689.29	277.44
330	769930.91	3320639.34	277.50
331	769930.72	3320589.34	277.44
332	769930.52	3320539.34	277.32
333	769929.68	3320489.36	277.23
334	769927.97	3320439.39	277.17
335	769926.25	3320389.42	277.20
336	769924.54	3320339.44	277.36
337	769922.10	3320289.52	277.62
338	769918.13	3320239.67	278.19
339	769914.17	3320189.83	278.62
340	769910.20	3320139.99	281.20
341	769906.14	3320090.15	280.96
342	769902.08	3320040.32	278.72
343	769903.22	3319990.37	279.34
344	769905.02	3319940.40	278.47
345	769903.99	3319890.46	278.37
346	769901.83	3319840.50	278.25
347	769898.14	3319790.64	278.20
348	769894.44	3319740.78	278.48
349	769890.12	3319690.97	278.36
350	769884.64	3319641.27	278.17
351	769879.16	3319591.57	278.23
352	769878.41	3319541.84	278.36
353	769874.27	3319492.30	277.95
354	769878.40	3319442.52	276.66
355	769895.33	3319395.81	276.32
356	769912.35	3319349.20	276.23
357	769914.10	3319299.59	276.25
358	769924.55	3319251.13	276.25
359	769950.94	3319208.66	276.20
360	769978.25	3319167.90	276.11
361	770003.08	3319124.51	275.95
362	770031.17	3319083.16	275.67
363	770064.02	3319045.47	275.30
364	770101.32	3319012.34	275.08
365	770146.82	3318992.51	274.96
366	770193.91	3318975.75	274.90
367	770242.27	3318963.85	274.86
368	770281.53	3318940.40	274.85
369	770307.58	3318898.00	274.85
370	770326.46	3318851.81	274.88
371	770336.15	3318803.19	274.95
372	770330.87	3318753.53	274.97
373	770296.61	3318720.76	274.96

374	770254.81	3318693.37	274.92
375	770222.50	3318655.81	274.87
376	770212.56	3318608.11	274.84
377	770206.87	3318559.17	274.81
378	770218.61	3318511.01	274.78
379	770235.95	3318465.72	274.67
380	770265.56	3318425.43	274.61
381	770297.15	3318386.98	274.54
382	770335.48	3318354.89	274.50
383	770375.83	3318325.36	274.50
384	770416.42	3318296.16	274.54
385	770457.27	3318267.34	274.60
386	770501.13	3318243.99	274.80
387	770543.11	3318218.79	275.31
388	770578.75	3318184.09	274.79
389	770614.37	3318149.09	274.07
390	770649.54	3318113.68	273.90
391	770682.73	3318076.71	273.76
392	770709.25	3318034.89	273.71
393	770738.15	3317994.91	273.62
394	770768.28	3317955.65	273.53
395	770796.65	3317914.48	273.43
396	770813.25	3317869.39	273.39
397	770814.37	3317819.40	273.41
398	770816.04	3317769.43	273.43
399	770817.68	3317719.46	273.49
400	770819.55	3317669.52	273.45
401	770804.94	3317624.76	273.40
402	770793.40	3317577.48	273.31
403	770797.28	3317527.65	273.19
404	770799.08	3317477.68	273.06
405	770800.88	3317427.71	272.93
406	770806.56	3317378.47	272.87
407	770826.96	3317333.29	272.77
408	770847.38	3317288.10	272.72
409	770870.29	3317243.73	272.77
410	770896.00	3317201.22	272.86
411	770929.68	3317165.68	272.97
412	770963.90	3317129.34	272.99
413	770991.49	3317087.64	272.96
414	771019.09	3317045.94	272.95
415	771052.94	3317010.40	272.99
416	771086.63	3316975.05	273.04
417	771115.14	3316935.08	272.95
418	771126.64	3316886.42	272.87
419	771142.27	3316838.99	272.84
420	771159.25	3316791.96	272.83

421	771178.10	3316745.65	272.79
422	771202.67	3316702.50	272.74
423	771232.79	3316662.68	272.67
424	771267.95	3316627.13	272.60
425	771303.30	3316591.78	272.53
426	771339.01	3316556.83	272.48
427	771381.26	3316530.08	272.45
428	771424.79	3316505.73	272.43
429	771471.64	3316488.74	272.46
430	771521.06	3316485.24	272.43
431	771565.88	3316501.34	272.39
432	771612.37	3316512.51	272.25
433	771659.58	3316528.70	272.08
434	771708.54	3316529.24	271.91
435	771750.37	3316501.98	271.77
436	771786.94	3316468.09	271.69
437	771819.55	3316430.25	271.68
438	771847.27	3316388.93	271.67
439	771869.33	3316344.10	271.70
440	771888.02	3316297.72	271.71
441	771909.69	3316252.69	271.69
442	771932.93	3316208.42	271.63
443	771956.17	3316164.14	271.45
444	771985.50	3316123.73	271.30
445	772015.59	3316083.80	271.24
446	772050.74	3316048.38	271.11
447	772086.97	3316013.92	271.00
448	772123.79	3315980.11	270.90
449	772161.26	3315947.00	270.76
450	772198.97	3315914.18	270.62
451	772237.75	3315882.61	270.47
452	772277.78	3315852.79	270.38
453	772318.99	3315824.48	270.32
454	772359.05	3315794.68	270.29
455	772396.57	3315761.64	270.26
456	772435.10	3315729.80	270.14
457	772474.25	3315698.69	270.03
458	772512.37	3315666.34	269.91
459	772555.47	3315641.37	269.79
460	772599.71	3315618.06	269.66
461	772643.95	3315594.76	269.56
462	772688.18	3315571.45	269.45
463	772732.42	3315548.14	269.40
464	772776.65	3315524.83	269.33
465	772820.89	3315501.53	269.25
466	772865.12	3315478.22	269.14
467	772909.36	3315454.91	269.02

468	772953.59	3315431.61	268.90
469	772993.00	3315401.47	268.80
470	773029.74	3315367.55	268.62
471	773054.39	3315324.71	268.53
472	773075.96	3315279.60	268.69
473	773095.68	3315233.70	268.79
474	773124.84	3315193.56	268.85
475	773129.30	3315145.49	268.75
476	773122.73	3315095.95	268.62
477	773116.69	3315046.32	268.53
478	773111.64	3314996.58	268.41
479	773107.90	3314946.73	268.37
480	773106.31	3314896.75	268.36
481	773106.89	3314846.79	268.34
482	773108.94	3314796.83	268.30
483	773110.99	3314746.87	268.21
484	773113.04	3314696.92	268.10
485	773115.09	3314646.96	267.98
486	773117.14	3314597.00	267.85
487	773120.49	3314547.15	267.71
488	773126.49	3314497.51	267.56
489	773132.76	3314447.91	267.44
490	773141.77	3314398.73	267.41
491	773150.79	3314349.55	267.30
492	773159.23	3314300.27	267.20
493	773167.03	3314250.88	267.10
494	773174.83	3314201.49	266.98
495	773188.44	3314153.44	266.84
496	773202.94	3314105.59	266.71
497	773217.44	3314057.74	266.60
498	773230.46	3314009.51	266.52
499	773240.90	3313960.61	266.50
500	773251.34	3313911.71	266.42
501	773265.22	3313864.03	266.39
502	773287.88	3313819.46	266.35
503	773310.53	3313774.88	266.44
504	773342.96	3313738.31	266.42
505	773383.20	3313709.08	266.38
506	773429.74	3313690.80	266.61
507	773477.96	3313677.68	267.13
508	773526.97	3313670.54	266.94
509	773576.95	3313670.01	266.89
510	773626.86	3313671.46	267.13
511	773676.69	3313675.54	267.71
512	773726.47	3313680.17	266.86
513	773776.17	3313685.68	266.87
514	773825.86	3313691.20	266.88

515	773874.73	3313701.64	266.87
516	773923.50	3313712.66	266.76
517	773972.88	3313720.29	266.75
518	774022.44	3313726.86	266.86
519	774071.37	3313737.18	266.76
520	774120.32	3313747.35	266.60
521	774169.50	3313756.38	266.50
522	774219.33	3313760.00	266.40
523	774268.90	3313753.56	266.29
524	774318.74	3313749.88	266.17
525	774368.67	3313747.28	266.04
526	774418.66	3313746.92	265.96
527	774468.56	3313744.42	265.93
528	774518.38	3313740.13	265.90
529	774568.13	3313735.18	265.87
530	774617.85	3313729.92	265.81
531	774667.05	3313738.14	265.70
532	774716.28	3313746.84	265.62
533	774765.71	3313754.35	265.57
534	774815.55	3313758.08	265.55
535	774865.19	3313763.62	265.53
536	774914.57	3313771.47	265.50
537	774964.16	3313775.27	265.47
538	775014.08	3313772.52	265.45
539	775063.95	3313770.61	265.36
540	775113.42	3313777.88	265.27
541	775163.16	3313782.39	265.11
542	775213.10	3313784.78	264.92
543	775262.98	3313787.98	264.80
544	775312.66	3313793.59	264.65
545	775362.35	3313799.20	264.49
546	775412.31	3313800.91	264.39
547	775462.14	3313803.73	264.14
548	775511.17	3313813.52	264.03
549	775560.76	3313817.08	263.84
550	775610.75	3313816.33	263.66
551	775660.75	3313816.58	263.58
552	775710.75	3313816.83	263.51
553	775760.72	3313815.84	263.44
554	775810.66	3313813.31	263.52
555	775860.21	3313806.77	263.64
556	775909.03	3313797.22	263.68
557	775953.91	3313776.03	263.68
558	775991.22	3313742.74	263.63
559	776021.40	3313704.24	263.50
560	776041.61	3313658.52	263.48
561	776057.25	3313611.03	263.46

562	776064.18	3313562.67	263.57
563	776043.25	3313518.56	263.66
564	776012.25	3313479.34	263.70
565	775974.17	3313447.94	263.71
566	775939.20	3313414.01	263.70
567	775904.73	3313378.01	263.70
568	775870.43	3313341.72	263.67
569	775836.89	3313304.76	263.64
570	775816.50	3313260.21	263.64
571	775799.53	3313215.90	263.70
572	775798.65	3313165.91	263.75
573	775809.81	3313117.83	263.74
574	775826.12	3313070.57	263.68
575	775842.42	3313023.30	263.61
576	775858.72	3312976.03	263.59
577	775875.02	3312928.76	263.58
578	775901.20	3312888.32	263.54
579	775931.76	3312848.84	263.52
580	775961.27	3312808.48	263.50
581	775991.54	3312768.83	263.46
582	776030.10	3312737.01	263.19
583	776068.67	3312705.18	263.15
584	776113.21	3312684.04	263.43
585	776160.51	3312667.83	263.60
586	776207.81	3312651.63	263.71
587	776255.11	3312635.42	263.75
588	776292.95	3312605.95	263.24
589	776334.32	3312578.08	262.94
590	776374.32	3312548.08	262.46
591	776413.21	3312516.95	262.39
592	776443.07	3312477.00	262.42
593	776471.43	3312435.82	262.38
594	776504.06	3312397.93	262.23
595	776536.69	3312360.05	262.06
596	776569.33	3312322.17	262.03
597	776598.19	3312281.35	262.03
598	776627.00	3312240.48	262.13
599	776657.52	3312200.94	262.29
600	776690.06	3312162.98	262.41
601	776713.53	3312119.73	262.60
602	776730.57	3312072.72	262.74
603	776747.02	3312025.51	262.82
604	776762.94	3311978.11	262.77
605	776778.87	3311930.72	262.74
606	776789.81	3311881.98	262.56
607	776799.89	3311833.00	262.18
608	776809.85	3311784.01	261.91

609	776819.79	3311735.00	261.62
610	776832.00	3311686.69	261.42
611	776850.87	3311640.38	261.36
612	776873.86	3311596.43	261.28
613	776904.10	3311556.61	261.10
614	776935.24	3311517.52	261.09
615	776967.98	3311479.74	261.16
616	777003.49	3311444.54	261.23
617	777039.15	3311409.50	261.24
618	777076.50	3311376.31	261.19
619	777114.91	3311344.31	261.12
620	777153.97	3311313.11	261.03
621	777193.59	3311282.61	260.94
622	777229.33	3311247.96	260.86
623	777262.32	3311210.40	260.85
624	777289.81	3311168.63	260.95
625	777324.60	3311132.99	261.09
626	777360.14	3311097.88	261.22
627	777392.99	3311060.18	261.25
628	777425.84	3311022.49	261.21
629	777445.09	3310976.68	261.12
630	777454.55	3310927.76	260.98
631	777471.65	3310880.77	260.79
632	777500.20	3310840.19	260.67
633	777531.34	3310801.07	260.55
634	777567.69	3310767.39	260.39
635	777608.09	3310737.93	260.23
636	777651.71	3310713.71	260.09
637	777696.28	3310691.05	259.93
638	777739.62	3310666.20	259.77
639	777782.16	3310639.93	259.58
640	777824.71	3310613.67	259.51
641	777867.89	3310588.46	259.39
642	777909.85	3310561.41	259.32
643	777949.92	3310531.51	259.28
644	777992.12	3310504.92	259.26
645	778036.02	3310480.98	259.23
646	778079.14	3310455.81	259.18
647	778119.85	3310426.78	259.08
648	778157.03	3310393.69	258.98
649	778190.60	3310356.76	258.87
650	778221.54	3310318.22	258.75
651	778259.41	3310285.57	258.67
652	778301.79	3310259.04	258.60
653	778344.60	3310233.23	258.59
654	778387.89	3310208.22	258.64
655	778431.79	3310184.29	258.75

656	778476.07	3310161.07	258.83
657	778521.77	3310140.81	258.85
658	778568.41	3310122.86	258.86
659	778608.31	3310092.81	258.89
660	778643.39	3310057.57	259.09
661	778669.75	3310015.74	259.25
662	778689.92	3309971.16	259.40
663	778726.01	3309936.79	259.46
664	778761.48	3309901.78	259.43
665	778795.49	3309866.67	259.40
666	778838.29	3309840.83	259.32
667	778880.99	3309814.82	259.21
668	778923.95	3309789.25	259.11
669	778967.36	3309764.45	258.91
670	779010.95	3309739.97	258.71
671	779053.78	3309714.16	258.49
672	779091.30	3309681.49	258.27
673	779127.19	3309646.67	258.09
674	779163.24	3309612.02	257.95
675	779199.39	3309577.49	258.35
676	779236.63	3309544.12	259.38
677	779273.37	3309510.23	258.00
678	779308.67	3309474.82	257.12
679	779343.97	3309439.41	257.00
680	779382.51	3309407.63	256.91
681	779416.89	3309371.35	256.83
682	779452.27	3309336.05	256.79
683	779488.62	3309301.72	256.77
684	779525.85	3309268.37	256.79
685	779563.73	3309235.72	256.91
686	779601.77	3309203.28	256.87
687	779640.48	3309171.66	256.74
688	779677.84	3309138.68	256.67
689	779711.52	3309102.25	256.59
690	779752.13	3309073.08	256.60
691	779793.33	3309045.06	256.58
692	779839.18	3309026.06	256.57
693	779880.84	3308998.43	256.55
694	779923.14	3308971.77	256.51
695	779965.25	3308944.82	256.44
696	780007.24	3308917.66	256.33
697	780049.35	3308890.71	256.19
698	780089.99	3308861.82	256.17
699	780127.50	3308828.76	256.15
700	780170.78	3308804.50	256.13
701	780218.31	3308790.43	256.27
702	780266.15	3308776.08	256.32

703	780313.51	3308760.06	256.36
704	780355.38	3308733.58	256.36
705	780397.96	3308707.91	256.38
706	780443.35	3308686.92	256.23
707	780488.13	3308664.70	256.07
708	780532.85	3308642.33	255.89
709	780576.03	3308617.15	255.86
710	780618.97	3308591.54	255.82
711	780662.79	3308567.45	255.70
712	780706.60	3308543.36	255.74
713	780750.00	3308518.52	255.71
714	780793.32	3308493.56	255.61
715	780836.56	3308468.45	255.50
716	780879.59	3308443.00	255.44
717	780922.67	3308417.62	255.39
718	780965.90	3308392.50	255.39
719	781008.95	3308367.08	255.30
720	781051.39	3308340.64	255.26
721	781093.83	3308314.21	255.32
722	781136.44	3308288.05	255.53
723	781179.39	3308262.44	257.04
724	781221.53	3308235.57	257.06
725	781263.78	3308208.89	256.51
726	781307.50	3308184.64	256.29
727	781350.55	3308159.21	256.32
728	781393.54	3308133.68	256.18
729	781436.42	3308107.96	256.16
730	781479.06	3308081.86	256.31
731	781522.87	3308057.89	256.20
732	781567.86	3308036.07	256.57
733	781610.77	3308010.52	256.94
734	781653.09	3307983.88	261.25
735	781696.64	3307959.49	256.71
736	781741.97	3307938.41	255.64
737	781786.98	3307916.73	255.57
738	781833.09	3307897.39	255.09
739	781879.47	3307878.71	254.97
740	781925.85	3307860.03	256.40
741	781972.23	3307841.36	257.16
742	782019.33	3307824.60	255.59
743	782066.61	3307808.35	255.61
744	782113.90	3307792.09	256.51
745	782157.46	3307767.91	256.66
746	782200.20	3307741.95	256.37
747	782242.94	3307716.00	255.44
748	782284.19	3307687.82	255.18
749	782324.56	3307658.33	255.10

750	782364.94	3307628.84	254.95
751	782404.15	3307597.90	254.38
752	782441.49	3307564.64	254.27
753	782475.30	3307527.92	254.31
754	782507.98	3307490.08	254.60
755	782535.62	3307448.75	254.21
756	782559.50	3307404.82	254.01
757	782577.92	3307358.40	253.91
758	782595.46	3307311.57	253.90
759	782612.99	3307264.75	254.30
760	782627.86	3307217.11	254.24
761	782639.39	3307168.46	254.22
762	782638.85	3307119.69	253.98
763	782628.26	3307070.83	253.81
764	782615.89	3307022.38	253.68
765	782604.04	3306973.81	253.60
766	782592.27	3306925.21	253.45
767	782580.50	3306876.62	253.22
768	782569.91	3306827.87	253.43
769	782569.15	3306777.88	253.24
770	782568.39	3306727.88	253.20
771	782567.62	3306677.89	253.04
772	782575.43	3306628.75	253.02
773	782586.07	3306579.90	252.95
774	782596.70	3306531.04	252.97
775	782607.55	3306482.23	252.93
776	782618.59	3306433.46	252.94
777	782629.63	3306384.70	252.83
778	782640.67	3306335.93	252.79
779	782651.71	3306287.17	253.06
780	782654.27	3306237.29	253.32
781	782656.12	3306187.33	253.58
782	782656.52	3306137.40	253.64
783	782652.44	3306087.56	253.66
784	782648.36	3306037.73	253.50
785	782648.61	3305987.86	253.43
786	782651.85	3305937.96	253.21
787	782655.65	3305888.17	252.99
788	782669.16	3305840.02	252.82
789	782682.66	3305791.88	252.59
790	782695.93	3305743.69	252.41
791	782703.62	3305694.29	252.26
792	782711.32	3305644.88	252.16
793	782726.10	3305597.26	252.10
794	782742.63	3305550.07	252.07
795	782759.17	3305502.88	252.06
796	782775.70	3305455.69	251.87

797	782795.99	3305410.16	251.85
798	782819.61	3305366.09	251.82
799	782843.24	3305322.03	251.80
800	782870.50	3305280.87	251.80
801	782908.33	3305248.17	251.82
802	782946.15	3305215.47	251.80
803	782983.98	3305182.77	251.75
804	783021.80	3305150.07	251.66
805	783059.63	3305117.37	251.65
806	783096.75	3305083.91	251.69
807	783132.42	3305048.87	251.64
808	783168.10	3305013.84	251.63
809	783203.77	3304978.81	252.03
810	783245.34	3304951.26	252.82
811	783287.76	3304924.78	253.25
812	783330.17	3304898.30	253.38
813	783372.58	3304871.82	253.52
814	783415.59	3304846.33	253.66
815	783457.35	3304819.10	253.97
816	783495.85	3304787.20	254.07
817	783540.22	3304768.61	254.07
818	783589.74	3304761.73	254.03
819	783639.47	3304756.76	253.90
820	783689.34	3304753.14	253.83
821	783736.24	3304737.50	253.68
822	783779.29	3304712.87	253.62
823	783818.51	3304681.86	253.63
824	783853.80	3304647.12	253.65
825	783882.74	3304606.34	253.62
826	783912.99	3304566.53	253.60
827	783949.33	3304533.41	253.54
828	783993.14	3304509.62	253.56
829	784039.19	3304490.14	253.53
830	784085.24	3304470.65	253.51
831	784131.29	3304451.17	253.47
832	784177.34	3304431.69	253.37
833	784225.31	3304417.76	253.32
834	784273.53	3304404.55	253.25
835	784322.38	3304394.64	253.20
836	784372.10	3304389.36	253.13
837	784421.14	3304391.21	253.08
838	784468.97	3304405.79	253.03
839	784517.03	3304418.99	253.05
840	784566.99	3304420.84	253.10
841	784616.92	3304422.37	253.15
842	784666.84	3304425.20	253.18
843	784716.76	3304428.03	253.04

844	784766.68	3304430.87	252.88
845	784816.60	3304433.70	252.50
846	784866.52	3304436.53	252.12
847	784916.44	3304439.37	251.53
848	784966.36	3304442.20	251.34
849	785016.28	3304445.02	251.18
850	785066.24	3304447.03	251.11
851	785116.20	3304449.03	251.04
852	785166.16	3304451.03	250.99
853	785216.12	3304453.03	250.96
854	785266.08	3304455.04	250.90
855	785315.86	3304459.67	250.88
856	785365.65	3304464.31	250.95
857	785415.45	3304467.64	250.98
858	785465.32	3304464.07	251.04
859	785515.16	3304460.13	250.97
860	785564.90	3304455.03	250.95
861	785614.64	3304449.94	250.96
862	785652.24	3304420.50	250.97
863	785686.24	3304383.84	250.97
864	785708.25	3304339.11	250.93
865	785729.38	3304293.80	250.94
866	785748.13	3304247.58	250.93
867	785762.17	3304199.60	250.90
868	785776.97	3304151.87	250.94
869	785795.53	3304105.44	250.91
870	785815.89	3304059.93	250.82
871	785842.25	3304017.44	250.74
872	785868.61	3303974.95	250.72
873	785889.89	3303929.85	250.67
874	785909.16	3303883.71	250.53
875	785923.70	3303835.89	250.37
876	785937.81	3303787.93	250.25
877	785940.32	3303738.51	250.09
878	785938.40	3303688.55	250.10
879	785936.81	3303638.58	250.08
880	785935.41	3303588.60	250.06
881	785931.29	3303538.87	250.01
882	785923.41	3303489.50	249.95
883	785898.05	3303446.69	249.82
884	785867.96	3303407.00	249.61
885	785834.35	3303369.98	249.44
886	785794.14	3303340.68	249.30
887	785761.91	3303303.09	249.19
888	785732.08	3303262.96	248.99
889	785705.25	3303220.93	248.83
890	785681.47	3303176.94	248.61

891	785657.38	3303133.13	248.52
892	785633.91	3303088.99	248.05
893	785611.75	3303044.18	247.73
894	785589.97	3302999.17	247.59
895	785568.75	3302953.90	245.50
896	785547.54	3302908.62	247.01
897	785526.32	3302863.34	247.24
898	785505.11	3302818.07	247.20
899	785495.87	3302769.36	245.42
900	785489.93	3302719.72	245.42
901	785483.98	3302670.07	247.44
902	785478.04	3302620.43	247.70
903	785476.55	3302570.75	248.56
904	785481.77	3302521.02	248.67
905	785486.98	3302471.29	248.73
906	785492.20	3302421.57	248.70
907	785497.42	3302371.84	248.71
908	785503.13	3302322.25	248.80
909	785523.66	3302276.66	248.94
910	785544.19	3302231.07	249.09
911	785564.72	3302185.48	249.18
912	785585.26	3302139.88	249.24
913	785605.79	3302094.29	249.20
914	785626.32	3302048.70	249.16
915	785646.85	3302003.11	249.18
916	785670.49	3301959.07	249.19
917	785694.41	3301915.16	249.14
918	785718.33	3301871.26	249.38
919	785742.26	3301827.35	249.56
920	785766.18	3301783.44	249.46
921	785792.43	3301740.97	249.36
922	785820.81	3301699.81	249.28
923	785849.20	3301658.64	249.18
924	785877.58	3301617.48	249.04
925	785905.96	3301576.32	248.78
926	785934.35	3301535.16	248.53
927	785973.49	3301504.44	248.47
928	786013.78	3301474.82	248.46
929	786054.06	3301445.20	248.58
930	786097.98	3301421.45	248.63
931	786142.43	3301398.55	248.51
932	786186.87	3301375.64	248.44
933	786232.32	3301355.28	248.28
934	786280.44	3301341.69	248.14
935	786328.56	3301328.10	248.12
936	786376.67	3301314.51	248.20
937	786424.79	3301300.92	248.18

938	786472.59	3301286.25	248.22
939	786520.31	3301271.32	248.19
940	786568.03	3301256.40	248.29
941	786615.51	3301240.74	248.30
942	786662.86	3301224.67	248.24
943	786710.20	3301208.59	248.16
944	786757.55	3301192.52	248.09
945	786805.91	3301179.91	248.00
946	786854.46	3301167.96	248.01
947	786902.74	3301155.00	247.95
948	786950.86	3301141.41	247.96
949	786994.06	3301119.42	247.91
950	787029.43	3301084.09	247.86
951	787042.41	3301035.81	247.85
952	787055.40	3300987.52	247.81
953	787066.08	3300938.88	247.80
954	787068.49	3300888.94	247.70
955	787070.90	3300839.00	247.73
956	787069.87	3300789.07	247.75
957	787067.08	3300739.14	247.76
958	787061.18	3300689.49	247.76
959	787055.29	3300639.84	247.78
960	787072.61	3300592.98	247.76
961	787090.11	3300546.14	247.66
962	787111.96	3300501.30	247.47
963	787135.96	3300457.43	247.23
964	787159.96	3300413.57	247.05
965	787196.11	3300380.48	247.03
966	787236.79	3300351.42	247.03
967	787278.01	3300323.27	246.99
968	787323.26	3300301.98	246.91
969	787368.50	3300280.69	246.80
970	787412.05	3300256.24	246.66
971	787454.98	3300230.60	246.41
972	787484.98	3300194.66	246.14
973	787500.42	3300147.11	245.88
974	787515.86	3300099.55	245.86
975	787531.29	3300051.99	245.07
976	787544.92	3300004.08	243.92
977	787548.58	3299954.21	245.77
978	787552.24	3299904.35	246.73
979	787555.89	3299854.48	246.85
980	787557.88	3299804.53	246.95
981	787558.66	3299754.59	247.00
982	787547.16	3299705.93	247.08
983	787535.66	3299657.27	247.14
984	787524.16	3299608.61	247.14

985	787512.66	3299559.95	246.90
986	787492.07	3299514.96	246.70
987	787466.63	3299471.92	246.37
988	787441.18	3299428.87	246.07
989	787415.74	3299385.83	246.05
990	787390.30	3299342.79	246.09
991	787364.85	3299299.75	246.19
992	787331.70	3299263.17	246.27
993	787293.75	3299230.61	246.31
994	787255.81	3299198.05	246.45
995	787217.86	3299165.49	246.50
996	787179.91	3299132.93	246.50
997	787141.97	3299100.38	246.41
998	787104.02	3299067.82	246.24
999	787066.08	3299035.26	246.26
1000	787028.13	3299002.70	246.32
1001	786990.19	3298970.13	246.38
1002	786953.23	3298936.46	246.42
1003	786916.27	3298902.79	246.41
1004	786879.30	3298869.11	246.46
1005	786842.34	3298835.44	246.53
1006	786805.38	3298801.77	246.58
1007	786768.42	3298768.10	246.61
1008	786731.45	3298734.43	246.59
1009	786694.49	3298700.76	246.48
1010	786657.36	3298667.27	246.26
1011	786619.33	3298634.81	245.92
1012	786581.30	3298602.36	245.57
1013	786543.27	3298569.90	245.34
1014	786505.24	3298537.44	245.19
1015	786467.20	3298504.98	244.99
1016	786429.17	3298472.52	244.89
1017	786391.14	3298440.06	243.42
1018	786353.11	3298407.60	243.42
1019	786315.08	3298375.14	245.11
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1021	786238.95	3298310.30	246.32
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1023	786162.81	3298245.47	246.37
1024	786131.28	3298206.95	246.47
1025	786101.53	3298166.76	246.58
1026	786071.78	3298126.57	246.71
1027	786042.04	3298086.38	246.85
1028	786012.29	3298046.20	247.03
1029	785984.80	3298004.50	247.30
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1031	785933.02	3297918.94	247.15

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1033	785891.46	3297829.07	247.24
1034	785878.84	3297780.69	247.30
1035	785868.98	3297731.91	247.43
1036	785867.25	3297681.94	247.48
1037	785865.51	3297631.97	247.49
1038	785863.78	3297582.00	247.39
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1040	785882.14	3297484.04	246.39
1041	785892.83	3297435.19	246.03
1042	785912.71	3297390.33	245.81
1043	785941.00	3297349.10	245.51
1044	785970.08	3297308.44	245.09
1045	786000.33	3297268.63	245.00
1046	786025.41	3297226.10	244.79
1047	786041.09	3297178.62	244.92
1048	786051.65	3297129.90	244.84
1049	786059.48	3297080.52	244.67
1050	786066.17	3297031.02	244.29
1051	786068.54	3296981.08	243.42
1052	786072.09	3296931.25	244.23
1053	786079.33	3296881.77	244.32
1054	786086.56	3296832.30	244.99
1055	786093.80	3296782.83	245.58
1056	786101.04	3296733.35	245.78
1057	786108.27	3296683.88	246.10
1058	786121.45	3296635.66	246.25
1059	786134.80	3296587.47	246.28
1060	786148.15	3296539.29	246.25
1061	786161.50	3296491.10	246.23
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1063	786199.86	3296399.72	246.24
1064	786225.49	3296356.79	246.13
1065	786251.12	3296313.86	245.92
1066	786288.72	3296282.12	245.69
1067	786329.83	3296253.66	245.36
1068	786370.94	3296225.19	245.24
1069	786412.34	3296197.20	245.10
1070	786456.07	3296172.96	245.09
1071	786499.80	3296148.72	244.91
1072	786543.53	3296124.48	244.73
1073	786585.61	3296097.73	244.65
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1075	786664.63	3296036.45	244.18
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1077	786726.63	3295958.75	243.97
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1079	786783.84	3295876.81	243.85
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1085	786932.97	3295616.52	244.03
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1087	786982.08	3295529.43	244.32
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1090	787046.83	3295394.13	245.04
1091	787062.19	3295346.55	244.95
1092	787077.54	3295298.96	244.99
1093	787084.23	3295250.03	244.94
1094	787085.64	3295200.05	244.79
1095	787091.54	3295150.74	244.72
1096	787104.79	3295102.53	243.23
1097	787118.04	3295054.32	242.98
1098	787097.86	3295010.39	244.18
1099	787072.89	3294967.07	244.42
1100	787028.74	3294950.50	244.68
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1102	786930.08	3294934.90	244.57
1103	786880.51	3294932.28	244.51
1104	786832.26	3294945.40	244.46
1105	786784.01	3294958.51	244.52
1106	786735.61	3294971.02	244.45
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1108	786638.08	3294993.13	244.33
1109	786589.32	3295004.18	244.14
1110	786540.56	3295015.24	243.85
1111	786491.80	3295026.30	243.40
1112	786442.09	3295031.66	243.21
1113	786392.37	3295037.00	243.14
1114	786342.66	3295042.33	243.30
1115	786293.06	3295039.51	244.17
1116	786243.53	3295032.69	244.03
1117	786194.83	3295021.54	243.99
1118	786146.27	3295009.60	244.08
1119	786097.91	3294997.09	244.12
1120	786051.94	3294977.42	244.19
1121	786007.83	3294953.94	244.27
1122	785972.31	3294919.02	244.42
1123	785948.60	3294876.41	244.55
1124	785951.35	3294826.64	244.52
1125	785962.50	3294777.90	244.64

1126	785973.69	3294729.17	244.76
1127	785985.34	3294680.54	244.40
1128	785997.68	3294632.10	243.86
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1130	786005.14	3294535.15	243.49
1131	785991.44	3294487.42	243.53
1132	785969.51	3294442.49	243.50
1133	785947.57	3294397.56	243.60
1134	785914.79	3294360.21	243.61
1135	785880.15	3294324.15	244.13
1136	785836.73	3294300.20	243.25
1137	785789.02	3294288.91	242.89
1138	785739.60	3294282.97	242.81
1139	785691.29	3294270.11	242.72
1140	785644.78	3294251.99	242.75
1141	785598.82	3294232.30	242.79
1142	785561.52	3294200.46	242.81
1143	785527.90	3294163.45	242.81
1144	785494.28	3294126.44	242.84
1145	785465.48	3294085.85	242.76
1146	785439.64	3294043.04	242.68
1147	785413.80	3294000.23	242.62
1148	785387.96	3293957.43	242.60
1149	785366.07	3293912.62	242.62
1150	785346.86	3293866.46	242.70
1151	785327.65	3293820.30	242.66
1152	785308.81	3293774.02	242.63
1153	785296.93	3293725.45	242.49
1154	785285.05	3293676.88	242.32
1155	785265.23	3293631.45	242.13
1156	785240.65	3293587.92	241.97
1157	785222.76	3293541.78	241.73
1158	785211.56	3293493.05	241.58
1159	785200.37	3293444.32	241.46
1160	785189.17	3293395.59	241.36
1161	785177.05	3293347.08	241.32
1162	785164.72	3293298.63	241.31
1163	785152.38	3293250.17	241.31
1164	785140.80	3293201.53	241.33
1165	785129.31	3293152.87	241.32
1166	785116.62	3293104.51	241.34
1167	785103.77	3293056.19	241.39
1168	785090.86	3293007.89	241.43
1169	785077.73	3292959.64	241.53
1170	785064.60	3292911.40	241.57
1171	785051.47	3292863.15	241.66
1172	785037.65	3292815.12	241.68

1173	785020.78	3292768.05	241.60
1174	785003.92	3292720.98	241.53
1175	784987.05	3292673.91	241.44
1176	784970.19	3292626.84	241.38
1177	784953.32	3292579.77	241.34
1178	784936.46	3292532.70	241.31
1179	784921.13	3292485.13	241.23
1180	784906.83	3292437.22	241.23
1181	784892.53	3292389.31	241.22
1182	784878.23	3292341.40	241.19
1183	784863.93	3292293.48	241.17
1184	784849.63	3292245.57	241.14
1185	784834.84	3292197.81	241.11
1186	784819.99	3292150.07	241.11
1187	784805.14	3292102.32	241.14
1188	784790.28	3292054.58	241.13
1189	784775.43	3292006.84	241.05
1190	784760.58	3291959.09	241.01
1191	784744.08	3291911.94	241.05
1192	784725.56	3291865.49	241.09
1193	784707.04	3291819.05	241.15
1194	784688.52	3291772.60	241.14
1195	784670.01	3291726.16	241.21
1196	784646.66	3291682.44	241.05
1197	784616.37	3291642.67	240.92
1198	784586.07	3291602.89	240.70
1199	784555.77	3291563.12	240.50
1200	784519.68	3291528.58	240.53
1201	784483.17	3291494.41	240.82
1202	784447.54	3291459.53	240.94
1203	784421.19	3291417.04	240.82
1204	784394.83	3291374.55	240.84
1205	784372.47	3291330.03	240.83

25 Year HFL Points			
S. No.	Left Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770600.74	3332762.78	302.19
2	770644.48	3332787.01	302.57
3	770688.21	3332811.24	304.54
4	770715.72	3332779.88	304.43
5	770744.36	3332738.90	304.48
6	770771.78	3332697.10	305.25
7	770799.43	3332655.44	304.25
8	770827.74	3332614.23	303.91
9	770855.28	3332572.54	304.71
10	770872.41	3332526.10	301.60
11	770900.83	3332488.70	302.84
12	770941.03	3332459.16	303.72
13	770980.73	3332428.77	302.64
14	771020.44	3332398.38	302.46
15	771060.14	3332367.99	302.39
16	771098.19	3332335.57	302.78
17	771135.95	3332302.79	302.20
18	771175.03	3332271.65	301.91
19	771214.86	3332241.42	301.93
20	771254.69	3332211.19	301.48
21	771294.77	3332181.33	301.32
22	771336.87	3332154.36	301.55
23	771378.98	3332127.40	301.83
24	771421.92	3332101.78	302.12
25	771465.03	3332076.47	302.40
26	771508.19	3332053.23	302.38
27	771537.43	3332013.46	302.55
28	771565.04	3331972.70	302.66
29	771591.10	3331932.44	302.47
30	771611.65	3331889.17	302.25
31	771634.84	3331847.12	302.08
32	771656.02	3331802.86	301.67
33	771671.13	3331756.84	301.15
34	771689.39	3331710.29	300.65
35	771713.92	3331669.36	300.61
36	771743.47	3331630.94	300.22
37	771766.42	3331586.52	302.45
38	771783.34	3331539.79	302.35
39	771787.96	3331490.06	301.38
40	771779.95	3331440.82	301.76
41	771761.37	3331394.54	300.99
42	771747.80	3331346.86	300.63
43	771732.59	3331299.45	300.94
44	771715.10	3331252.71	301.66

45	771688.13	3331211.35	301.48
46	771656.72	3331173.91	301.14
47	771628.36	3331132.75	301.09
48	771591.81	3331099.03	301.56
49	771552.16	3331068.57	301.42
50	771510.32	3331042.43	300.90
51	771463.18	3331025.75	300.04
52	771416.05	3331009.08	298.97
53	771370.49	3330988.60	298.65
54	771325.46	3330966.87	298.23
55	771279.74	3330946.67	298.04
56	771233.63	3330927.34	298.03
57	771188.10	3330906.68	297.88
58	771142.58	3330886.00	297.77
59	771097.25	3330864.90	297.75
60	771051.92	3330843.79	297.77
61	771008.14	3330819.66	297.43
62	770964.55	3330795.17	297.27
63	770920.75	3330771.06	297.14
64	770876.92	3330747.01	297.01
65	770833.24	3330722.68	296.88
66	770789.92	3330697.70	296.76
67	770746.61	3330672.72	296.64
68	770706.16	3330643.53	296.47
69	770667.03	3330612.41	296.38
70	770631.44	3330577.64	296.28
71	770599.18	3330539.44	296.20
72	770566.99	3330501.18	296.14
73	770534.84	3330462.88	296.10
74	770502.55	3330424.71	296.08
75	770469.54	3330387.16	296.06
76	770436.53	3330349.60	296.10
77	770403.52	3330312.05	296.29
78	770370.81	3330274.44	297.02
79	770353.12	3330227.79	297.89
80	770359.05	3330178.15	296.92
81	770364.99	3330128.50	297.07
82	770371.18	3330078.90	296.92
83	770383.60	3330030.47	297.39
84	770396.03	3329982.04	297.99
85	770404.15	3329932.93	297.95
86	770431.72	3329892.58	297.97
87	770479.37	3329880.81	296.66
88	770528.67	3329887.71	295.23
89	770576.48	3329902.36	294.99
90	770621.73	3329923.54	294.99
91	770668.21	3329941.90	295.01

92	770715.45	3329957.82	295.05
93	770764.79	3329965.92	295.08
94	770814.63	3329967.27	295.05
95	770864.63	3329966.93	295.00
96	770914.61	3329965.78	295.02
97	770964.58	3329964.35	295.08
98	771014.51	3329961.70	295.23
99	771059.02	3329940.07	295.28
100	771098.49	3329910.76	295.29
101	771133.53	3329875.32	295.27
102	771160.25	3329833.65	295.23
103	771184.41	3329790.07	295.26
104	771189.76	3329742.31	295.28
105	771202.87	3329695.98	295.41
106	771207.25	3329647.66	295.38
107	771192.85	3329599.99	295.03
108	771192.16	3329550.00	295.00
109	771179.04	3329502.22	294.77
110	771163.32	3329454.99	294.66
111	771138.15	3329411.79	294.64
112	771124.23	3329364.29	294.76
113	771110.06	3329316.34	294.95
114	771095.89	3329268.38	295.05
115	771081.72	3329220.43	295.11
116	771065.75	3329173.07	295.09
117	771048.95	3329125.98	294.95
118	771032.16	3329078.88	294.82
119	771010.43	3329034.08	294.69
120	770985.25	3328990.88	294.55
121	770960.07	3328947.69	294.38
122	770934.89	3328904.49	294.19
123	770907.93	3328862.40	294.07
124	770880.39	3328820.67	294.02
125	770852.85	3328778.94	293.93
126	770825.31	3328737.20	293.76
127	770795.55	3328697.10	293.60
128	770763.97	3328658.34	293.43
129	770732.38	3328619.58	293.32
130	770700.53	3328581.05	293.21
131	770667.08	3328543.88	293.09
132	770633.64	3328506.71	292.97
133	770600.20	3328469.54	292.78
134	770559.20	3328441.62	292.60
135	770516.09	3328416.30	292.47
136	770472.97	3328390.98	292.28
137	770431.62	3328362.94	292.07
138	770390.87	3328333.97	291.95

139	770358.84	3328297.45	291.85
140	770336.04	3328252.96	291.77
141	770314.42	3328207.95	291.67
142	770297.43	3328160.92	291.57
143	770280.17	3328114.00	291.44
144	770262.08	3328067.38	291.36
145	770238.55	3328023.85	291.26
146	770207.91	3327984.33	291.15
147	770177.27	3327944.82	291.08
148	770144.11	3327907.42	290.97
149	770110.60	3327870.32	290.82
150	770078.56	3327831.95	290.67
151	770047.14	3327793.05	290.48
152	770018.22	3327752.80	290.35
153	770002.58	3327705.31	290.21
154	770008.58	3327656.23	290.18
155	770012.01	3327610.97	290.17
156	769988.00	3327567.31	290.01
157	769960.26	3327525.84	289.84
158	769935.80	3327482.24	289.69
159	769905.54	3327442.48	289.52
160	769876.56	3327401.81	289.37
161	769850.08	3327359.40	289.26
162	769811.80	3327330.51	289.19
163	769774.63	3327297.58	289.13
164	769738.73	3327262.78	289.10
165	769703.84	3327227.10	289.06
166	769674.65	3327186.51	289.01
167	769645.45	3327145.92	288.92
168	769616.25	3327105.33	288.84
169	769585.26	3327066.14	288.76
170	769552.98	3327027.95	288.67
171	769520.70	3326989.77	288.55
172	769496.44	3326946.33	288.44
173	769474.30	3326901.50	288.36
174	769448.67	3326858.82	288.30
175	769418.60	3326818.87	288.25
176	769388.52	3326778.92	288.20
177	769371.24	3326733.36	288.21
178	769362.14	3326684.19	288.25
179	769353.03	3326635.03	288.27
180	769338.56	3326587.24	288.25
181	769322.91	3326539.75	288.20
182	769298.83	3326497.19	288.12
183	769265.12	3326460.27	288.01
184	769230.86	3326423.94	287.90
185	769191.28	3326393.38	287.76

186	769149.19	3326368.34	287.67
187	769100.14	3326358.64	287.60
188	769051.09	3326348.94	287.52
189	769004.96	3326330.39	287.42
190	768959.76	3326309.03	287.32
191	768913.22	3326291.22	287.15
192	768864.58	3326280.28	286.90
193	768816.82	3326271.14	286.76
194	768784.60	3326232.91	286.67
195	768754.38	3326193.22	286.60
196	768728.13	3326150.67	286.53
197	768704.65	3326106.54	286.47
198	768681.25	3326062.37	286.40
199	768652.55	3326021.43	286.33
200	768623.84	3325980.49	286.23
201	768598.69	3325937.32	286.14
202	768574.37	3325893.64	286.03
203	768550.05	3325849.95	285.92
204	768528.88	3325804.70	285.82
205	768508.25	3325759.17	285.72
206	768485.38	3325714.71	285.62
207	768471.95	3325666.70	285.54
208	768459.91	3325618.17	285.49
209	768452.86	3325568.69	285.42
210	768446.90	3325519.06	285.37
211	768442.53	3325469.25	285.27
212	768438.16	3325419.44	285.18
213	768433.79	3325369.63	285.08
214	768429.43	3325319.82	284.96
215	768425.06	3325270.01	284.88
216	768420.69	3325220.20	284.80
217	768420.83	3325170.22	284.69
218	768421.17	3325120.22	284.59
219	768421.29	3325070.22	284.51
220	768421.68	3325020.22	284.43
221	768422.12	3324970.23	284.32
222	768422.75	3324920.23	284.22
223	768422.86	3324870.23	284.13
224	768422.63	3324820.23	284.06
225	768408.37	3324775.43	284.05
226	768400.24	3324726.10	284.04
227	768392.11	3324676.76	284.04
228	768392.93	3324627.12	283.97
229	768397.70	3324577.35	283.85
230	768402.86	3324527.62	283.74
231	768411.10	3324478.51	283.63
232	768425.84	3324430.74	283.64

233	768447.91	3324385.88	283.83
234	768470.81	3324341.46	284.09
235	768496.92	3324298.82	284.21
236	768520.66	3324254.82	284.22
237	768534.37	3324207.17	284.13
238	768545.62	3324158.45	284.11
239	768557.01	3324109.77	284.07
240	768564.75	3324060.40	283.94
241	768568.98	3324010.73	283.73
242	768567.89	3323960.74	283.51
243	768551.16	3323914.39	283.33
244	768540.91	3323865.63	283.11
245	768538.17	3323815.71	283.00
246	768545.67	3323766.84	282.86
247	768536.20	3323718.64	282.70
248	768522.95	3323670.42	282.52
249	768510.36	3323622.04	282.45
250	768498.04	3323573.59	282.39
251	768489.92	3323524.25	282.37
252	768481.80	3323474.92	282.43
253	768474.59	3323425.46	282.45
254	768469.15	3323375.75	282.44
255	768466.02	3323326.13	282.42
256	768475.12	3323276.97	282.24
257	768486.11	3323228.28	282.10
258	768501.52	3323180.72	282.02
259	768516.93	3323133.15	281.97
260	768517.13	3323083.85	281.92
261	768512.80	3323034.04	281.87
262	768508.48	3322984.23	282.10
263	768504.16	3322934.41	282.11
264	768499.83	3322884.60	282.35
265	768495.51	3322834.79	282.39
266	768491.19	3322784.97	282.40
267	768480.97	3322736.76	282.35
268	768460.90	3322690.97	282.49
269	768443.59	3322644.15	282.44
270	768428.94	3322596.34	282.24
271	768414.64	3322548.44	282.09
272	768401.10	3322500.30	281.98
273	768387.49	3322452.19	282.00
274	768372.79	3322404.40	281.86
275	768358.03	3322356.63	281.72
276	768343.05	3322308.93	281.64
277	768327.24	3322261.49	281.54
278	768315.66	3322212.94	281.37
279	768305.99	3322163.89	281.18

280	768296.17	3322114.86	280.99
281	768285.88	3322065.93	280.82
282	768274.47	3322017.35	280.69
283	768255.75	3321971.00	280.58
284	768239.57	3321923.69	280.49
285	768221.93	3321876.91	280.41
286	768208.69	3321828.84	280.36
287	768197.81	3321780.03	280.31
288	768186.77	3321731.27	280.26
289	768174.51	3321682.80	280.21
290	768161.74	3321634.46	280.18
291	768150.76	3321585.68	280.10
292	768140.12	3321536.83	280.00
293	768136.65	3321487.09	279.87
294	768135.05	3321437.11	279.74
295	768130.12	3321388.24	279.60
296	768142.93	3321339.91	279.43
297	768171.05	3321299.58	279.31
298	768217.88	3321282.05	279.24
299	768267.07	3321273.58	279.21
300	768316.94	3321274.58	279.24
301	768366.54	3321280.53	279.25
302	768416.01	3321287.77	279.19
303	768465.49	3321295.00	279.07
304	768514.96	3321302.23	279.00
305	768564.53	3321308.70	278.88
306	768614.27	3321313.73	278.79
307	768664.02	3321318.76	278.72
308	768713.77	3321323.78	278.65
309	768763.52	3321328.75	278.56
310	768813.27	3321333.73	278.55
311	768862.94	3321339.38	278.47
312	768912.34	3321347.08	278.41
313	768961.74	3321354.78	278.34
314	769011.48	3321356.48	278.26
315	769061.44	3321354.33	278.16
316	769111.39	3321352.18	278.06
317	769161.37	3321350.79	278.02
318	769211.36	3321350.29	278.00
319	769261.36	3321349.80	278.00
320	769311.29	3321348.84	277.99
321	769359.52	3321335.65	277.98
322	769407.75	3321322.45	277.91
323	769455.98	3321309.26	277.84
324	769504.21	3321296.08	277.80
325	769552.45	3321282.92	277.75
326	769600.68	3321269.77	277.73

327	769649.63	3321259.54	277.76
328	769698.57	3321249.32	277.81
329	769747.52	3321239.10	278.02
330	769796.72	3321230.24	278.08
331	769845.97	3321221.62	278.03
332	769895.30	3321213.77	277.91
333	769945.29	3321212.95	277.81
334	769995.00	3321213.08	277.75
335	770036.17	3321241.46	277.79
336	770077.33	3321269.83	277.94
337	770121.12	3321292.98	278.20
338	770168.58	3321307.86	278.77
339	770217.90	3321299.62	279.20
340	770265.78	3321286.23	281.79
341	770311.38	3321266.40	281.54
342	770348.31	3321232.75	279.30
343	770388.25	3321202.67	279.92
344	770415.59	3321161.05	279.05
345	770422.48	3321112.42	278.96
346	770425.23	3321062.52	278.83
347	770424.03	3321012.59	278.79
348	770419.06	3320962.91	279.06
349	770411.46	3320914.10	278.95
350	770393.88	3320867.31	278.76
351	770392.25	3320817.78	278.82
352	770390.84	3320767.93	278.95
353	770379.32	3320720.66	278.54
354	770358.84	3320675.06	277.24
355	770338.33	3320629.46	276.91
356	770317.82	3320583.86	276.82
357	770293.03	3320540.51	276.83
358	770267.04	3320497.80	276.84
359	770245.71	3320452.60	276.79
360	770223.02	3320408.10	276.69
361	770197.49	3320365.11	276.54
362	770173.62	3320321.20	276.25
363	770150.49	3320276.87	275.89
364	770133.10	3320230.02	275.67
365	770116.23	3320182.95	275.55
366	770099.81	3320135.72	275.49
367	770085.11	3320087.96	275.44
368	770071.60	3320039.82	275.43
369	770063.18	3319990.72	275.43
370	770058.30	3319940.96	275.47
371	770056.52	3319891.01	275.53
372	770055.27	3319841.02	275.56
373	770053.89	3319791.04	275.55

374	770052.50	3319741.06	275.50
375	770051.81	3319691.07	275.45
376	770050.98	3319641.08	275.42
377	770050.30	3319591.08	275.39
378	770050.07	3319541.08	275.36
379	770049.11	3319491.09	275.26
380	770062.64	3319446.37	275.20
381	770080.84	3319399.80	275.13
382	770097.36	3319352.65	275.09
383	770111.95	3319304.82	275.08
384	770133.10	3319259.89	275.13
385	770158.56	3319216.86	275.18
386	770195.58	3319185.11	275.39
387	770237.99	3319158.63	275.90
388	770282.36	3319135.59	275.38
389	770330.50	3319122.69	274.66
390	770379.33	3319113.07	274.48
391	770428.69	3319116.71	274.35
392	770470.93	3319142.36	274.29
393	770518.93	3319149.30	274.20
394	770559.08	3319178.09	274.11
395	770609.05	3319179.63	274.01
396	770659.05	3319178.92	273.98
397	770704.55	3319163.73	274.00
398	770745.87	3319135.57	274.01
399	770787.20	3319107.42	274.07
400	770825.20	3319075.80	274.04
401	770854.60	3319035.38	273.98
402	770881.11	3318993.03	273.90
403	770903.11	3318948.13	273.78
404	770925.18	3318903.27	273.65
405	770941.86	3318856.24	273.51
406	770945.08	3318806.47	273.46
407	770946.82	3318756.50	273.35
408	770945.71	3318706.59	273.31
409	770918.58	3318666.61	273.36
410	770884.53	3318630.02	273.45
411	770848.58	3318595.26	273.56
412	770801.41	3318587.33	273.58
413	770751.61	3318583.43	273.54
414	770702.40	3318575.31	273.53
415	770654.19	3318562.07	273.57
416	770622.03	3318523.87	273.63
417	770625.07	3318476.05	273.53
418	770655.23	3318436.17	273.45
419	770685.39	3318396.30	273.43
420	770715.56	3318356.42	273.41

421	770745.72	3318316.54	273.38
422	770778.35	3318278.70	273.33
423	770811.84	3318241.57	273.25
424	770841.00	3318201.15	273.19
425	770867.87	3318158.99	273.12
426	770894.75	3318116.82	273.07
427	770921.62	3318074.66	273.03
428	770948.50	3318032.50	273.02
429	770974.93	3317990.09	273.05
430	770996.31	3317944.97	273.01
431	771014.49	3317901.21	272.98
432	771016.30	3317851.25	272.84
433	771018.33	3317801.30	272.66
434	771019.86	3317751.32	272.50
435	771020.90	3317701.33	272.36
436	771020.99	3317651.34	272.28
437	771004.59	3317607.83	272.26
438	770988.69	3317560.47	272.26
439	770983.62	3317510.95	272.28
440	770997.50	3317463.54	272.29
441	771016.74	3317417.53	272.28
442	771041.38	3317374.20	272.21
443	771062.47	3317328.89	272.03
444	771088.85	3317286.44	271.88
445	771119.42	3317246.88	271.83
446	771146.59	3317204.91	271.69
447	771177.22	3317165.39	271.58
448	771205.46	3317124.46	271.48
449	771221.61	3317077.43	271.34
450	771230.86	3317028.29	271.20
451	771238.90	3316978.95	271.05
452	771246.44	3316929.52	270.96
453	771261.31	3316882.06	270.90
454	771279.50	3316835.48	270.87
455	771306.81	3316796.80	270.84
456	771350.28	3316772.08	270.72
457	771393.87	3316747.59	270.61
458	771437.67	3316723.48	270.50
459	771481.47	3316699.36	270.37
460	771530.80	3316698.95	270.25
461	771577.46	3316716.82	270.15
462	771624.83	3316731.10	270.03
463	771674.82	3316731.67	269.98
464	771724.81	3316732.13	269.92
465	771774.80	3316733.16	269.84
466	771824.53	3316733.20	269.73
467	771869.91	3316719.78	269.60

468	771910.55	3316690.74	269.48
469	771939.02	3316649.64	269.38
470	771949.90	3316601.13	269.21
471	771981.14	3316562.77	269.12
472	772024.71	3316538.25	269.27
473	772071.68	3316523.52	269.37
474	772120.97	3316515.26	269.44
475	772168.66	3316501.02	269.33
476	772204.77	3316467.52	269.21
477	772229.21	3316424.33	269.11
478	772260.16	3316385.09	268.99
479	772289.40	3316344.57	268.96
480	772317.24	3316303.03	268.95
481	772348.60	3316264.15	268.93
482	772382.89	3316227.80	268.88
483	772420.50	3316194.94	268.80
484	772459.65	3316164.03	268.68
485	772500.33	3316134.98	268.56
486	772541.15	3316106.13	268.44
487	772582.22	3316077.63	268.29
488	772623.69	3316049.73	268.14
489	772664.22	3316020.55	268.03
490	772703.85	3315990.05	267.99
491	772743.67	3315959.82	267.88
492	772783.92	3315930.16	267.78
493	772824.80	3315901.49	267.68
494	772868.78	3315877.71	267.56
495	772912.37	3315853.22	267.43
496	772955.32	3315827.62	267.29
497	772999.51	3315804.35	267.18
498	773043.51	3315780.78	267.11
499	773085.09	3315753.12	267.08
500	773117.73	3315716.33	267.00
501	773146.19	3315675.31	266.97
502	773172.73	3315633.10	266.94
503	773196.99	3315589.38	267.03
504	773215.69	3315543.18	267.00
505	773232.03	3315495.93	266.97
506	773241.32	3315446.88	267.20
507	773247.77	3315397.45	267.71
508	773245.96	3315347.48	267.53
509	773245.08	3315297.56	267.48
510	773251.42	3315247.96	267.71
511	773258.34	3315198.53	268.30
512	773275.90	3315151.84	267.45
513	773295.29	3315105.75	267.46
514	773314.90	3315059.76	267.47

515	773331.37	3315012.55	267.45
516	773347.71	3314965.30	267.34
517	773364.73	3314918.30	267.34
518	773383.92	3314872.13	267.45
519	773402.84	3314825.86	267.34
520	773419.86	3314778.94	267.19
521	773442.10	3314734.16	267.08
522	773469.45	3314692.44	266.98
523	773500.13	3314652.98	266.87
524	773526.64	3314610.78	266.76
525	773529.60	3314561.14	266.63
526	773516.06	3314513.17	266.55
527	773497.12	3314467.28	266.52
528	773495.22	3314417.32	266.49
529	773496.95	3314367.48	266.46
530	773503.16	3314317.87	266.40
531	773506.91	3314268.01	266.28
532	773506.33	3314218.10	266.21
533	773503.73	3314168.17	266.15
534	773501.13	3314118.24	266.13
535	773492.71	3314069.02	266.12
536	773507.21	3314023.15	266.09
537	773530.96	3313979.17	266.06
538	773557.36	3313936.80	266.04
539	773599.47	3313910.27	265.95
540	773644.03	3313887.60	265.85
541	773687.83	3313863.60	265.69
542	773735.42	3313850.09	265.51
543	773785.27	3313854.04	265.38
544	773835.11	3313857.98	265.23
545	773884.96	3313861.93	265.07
546	773934.80	3313865.88	264.97
547	773984.53	3313871.04	264.72
548	774034.21	3313876.67	264.62
549	774083.89	3313882.30	264.42
550	774133.57	3313887.92	264.25
551	774183.12	3313894.47	264.16
552	774232.37	3313903.13	264.10
553	774281.61	3313911.79	264.02
554	774330.86	3313920.43	264.11
555	774380.12	3313928.98	264.22
556	774429.39	3313937.52	264.26
557	774478.65	3313946.07	264.27
558	774527.89	3313954.72	264.21
559	774575.68	3313969.41	264.09
560	774623.48	3313984.10	264.07
561	774671.27	3313998.79	264.05

562	774715.91	3314020.75	264.15
563	774759.28	3314045.63	264.25
564	774802.66	3314070.50	264.29
565	774846.53	3314094.43	264.29
566	774891.63	3314116.00	264.29
567	774936.74	3314137.57	264.28
568	774982.94	3314156.60	264.26
569	775029.63	3314174.50	264.22
570	775076.39	3314192.18	264.23
571	775124.64	3314205.29	264.29
572	775172.89	3314218.39	264.34
573	775221.36	3314230.48	264.32
574	775270.70	3314238.59	264.26
575	775320.04	3314246.71	264.19
576	775369.38	3314254.82	264.18
577	775418.71	3314262.94	264.16
578	775468.05	3314271.05	264.12
579	775517.57	3314275.06	264.10
580	775567.43	3314271.36	264.08
581	775617.30	3314267.66	264.04
582	775667.11	3314263.57	263.77
583	775716.58	3314256.24	263.73
584	775766.04	3314248.91	264.02
585	775814.81	3314238.73	264.18
586	775862.25	3314222.92	264.29
587	775909.68	3314207.11	264.33
588	775947.35	3314175.02	263.82
589	775983.60	3314140.59	263.53
590	776019.81	3314106.11	263.04
591	776055.49	3314071.08	262.98
592	776091.17	3314036.06	263.01
593	776126.93	3314001.11	262.96
594	776162.74	3313966.22	262.82
595	776198.56	3313931.33	262.64
596	776234.24	3313896.31	262.61
597	776269.81	3313861.16	262.61
598	776305.37	3313826.01	262.71
599	776340.54	3313790.57	262.87
600	776365.80	3313747.41	263.00
601	776391.05	3313704.26	263.18
602	776406.37	3313657.15	263.32
603	776417.64	3313608.44	263.40
604	776430.22	3313560.13	263.36
605	776448.07	3313513.42	263.33
606	776463.34	3313465.98	263.15
607	776472.95	3313416.91	262.76
608	776476.27	3313367.78	262.49

609	776459.25	3313321.14	262.21
610	776429.44	3313281.21	262.01
611	776384.51	3313263.09	261.94
612	776335.37	3313254.25	261.87
613	776285.59	3313253.53	261.68
614	776236.05	3313260.34	261.68
615	776186.22	3313263.94	261.74
616	776136.52	3313264.09	261.81
617	776090.96	3313245.85	261.83
618	776071.02	3313202.67	261.78
619	776067.55	3313153.00	261.71
620	776078.42	3313104.66	261.62
621	776094.89	3313057.45	261.52
622	776117.69	3313013.27	261.45
623	776148.03	3312974.12	261.44
624	776185.47	3312940.98	261.54
625	776225.85	3312911.73	261.67
626	776268.01	3312884.86	261.81
627	776314.45	3312868.73	261.84
628	776363.56	3312859.36	261.79
629	776411.91	3312847.48	261.70
630	776457.89	3312827.84	261.56
631	776503.89	3312808.25	261.38
632	776550.01	3312788.93	261.26
633	776594.18	3312766.15	261.13
634	776634.36	3312736.45	260.98
635	776670.25	3312701.64	260.82
636	776702.11	3312663.36	260.67
637	776720.03	3312618.75	260.52
638	776722.34	3312568.81	260.35
639	776725.07	3312519.08	260.17
640	776736.93	3312470.51	260.09
641	776749.71	3312422.19	259.97
642	776764.30	3312374.36	259.90
643	776778.89	3312326.54	259.86
644	776804.76	3312284.21	259.84
645	776833.39	3312243.21	259.81
646	776862.02	3312202.22	259.77
647	776886.37	3312158.60	259.67
648	776910.01	3312114.54	259.56
649	776933.65	3312070.48	259.45
650	776951.49	3312023.89	259.34
651	776967.73	3311976.60	259.26
652	776985.37	3311929.86	259.19
653	777005.68	3311884.17	259.18
654	777029.82	3311840.76	259.22
655	777060.28	3311801.11	259.33

656	777088.20	3311759.65	259.42
657	777129.31	3311733.59	259.43
658	777174.54	3311712.27	259.44
659	777220.99	3311694.40	259.47
660	777269.56	3311682.55	259.68
661	777318.14	3311670.70	259.84
662	777366.83	3311659.36	259.99
663	777415.72	3311648.89	260.04
664	777458.20	3311622.54	260.02
665	777503.57	3311601.57	259.98
666	777547.35	3311577.86	259.91
667	777587.80	3311548.53	259.80
668	777622.72	3311512.74	259.69
669	777644.43	3311468.78	259.50
670	777659.13	3311421.22	259.29
671	777660.77	3311371.25	259.08
672	777666.87	3311321.81	258.85
673	777663.34	3311271.97	258.67
674	777644.12	3311226.38	258.53
675	777628.89	3311179.04	258.94
676	777613.62	3311132.69	259.96
677	777607.23	3311083.40	258.58
678	777603.18	3311033.88	257.70
679	777620.81	3310987.80	257.59
680	777654.20	3310950.77	257.50
681	777687.91	3310914.61	257.41
682	777723.51	3310881.10	257.38
683	777763.87	3310851.95	257.35
684	777809.26	3310834.36	257.38
685	777850.55	3310806.44	257.49
686	777887.86	3310773.15	257.45
687	777925.16	3310739.85	257.32
688	777962.46	3310706.55	257.25
689	778000.87	3310674.61	257.18
690	778040.76	3310644.47	257.19
691	778080.66	3310614.33	257.17
692	778120.55	3310584.19	257.15
693	778161.15	3310555.02	257.13
694	778202.21	3310526.48	257.10
695	778243.26	3310497.94	257.03
696	778283.79	3310468.70	256.91
697	778322.51	3310437.08	256.77
698	778361.24	3310405.45	256.75
699	778400.25	3310374.18	256.74
700	778439.51	3310343.23	256.71
701	778485.83	3310324.42	256.86
702	778530.78	3310302.99	256.90

703	778573.58	3310277.18	256.95
704	778613.51	3310247.66	256.95
705	778650.44	3310213.97	256.97
706	778689.19	3310182.38	256.81
707	778727.95	3310150.78	256.65
708	778771.24	3310126.00	256.48
709	778815.32	3310102.41	256.44
710	778859.41	3310078.82	256.40
711	778903.49	3310055.23	256.29
712	778944.18	3310026.44	256.33
713	778983.47	3309995.51	256.29
714	779022.76	3309964.59	256.19
715	779062.05	3309933.67	256.09
716	779101.34	3309902.74	256.02
717	779140.53	3309871.70	255.98
718	779178.78	3309839.50	255.97
719	779218.11	3309808.91	255.88
720	779262.45	3309785.81	255.84
721	779306.78	3309762.68	255.91
722	779350.20	3309737.87	256.11
723	779393.61	3309713.07	257.62
724	779437.02	3309688.27	257.64
725	779478.72	3309660.80	257.10
726	779519.19	3309631.44	256.88
727	779559.66	3309602.08	256.91
728	779593.82	3309565.64	256.77
729	779627.37	3309528.71	256.75
730	779668.80	3309500.72	256.90
731	779708.09	3309469.83	256.78
732	779748.53	3309440.44	257.15
733	779789.09	3309411.25	257.52
734	779830.12	3309382.68	261.84
735	779870.97	3309353.85	257.29
736	779911.08	3309323.99	256.23
737	779950.96	3309293.84	256.16
738	779990.48	3309263.21	255.68
739	780030.33	3309233.01	255.55
740	780070.55	3309203.31	256.99
741	780110.91	3309173.79	257.75
742	780151.08	3309144.02	256.18
743	780191.73	3309114.91	256.20
744	780231.50	3309084.64	257.09
745	780269.11	3309051.76	257.24
746	780304.76	3309016.70	256.95
747	780339.86	3308981.11	256.03
748	780375.10	3308945.64	255.77
749	780410.93	3308910.76	255.68

750	780446.29	3308875.41	255.54
751	780481.96	3308840.39	254.96
752	780518.57	3308806.33	254.85
753	780553.87	3308770.93	254.89
754	780595.26	3308743.06	255.19
755	780635.87	3308713.90	254.79
756	780676.88	3308685.30	254.59
757	780718.27	3308657.25	254.49
758	780764.00	3308637.40	254.49
759	780810.48	3308618.99	254.88
760	780857.12	3308600.98	254.82
761	780903.92	3308583.36	254.81
762	780948.22	3308560.46	254.57
763	780991.58	3308535.56	254.39
764	781036.50	3308513.81	254.26
765	781079.81	3308489.00	254.19
766	781122.65	3308463.25	254.03
767	781166.39	3308439.03	253.81
768	781209.59	3308413.90	254.01
769	781251.46	3308386.57	253.82
770	781293.33	3308359.25	253.79
771	781336.81	3308334.65	253.62
772	781381.06	3308311.36	253.60
773	781424.35	3308286.39	253.53
774	781467.06	3308260.39	253.56
775	781510.52	3308235.69	253.52
776	781554.36	3308211.66	253.53
777	781598.76	3308188.82	253.41
778	781645.60	3308171.33	253.38
779	781692.64	3308154.43	253.65
780	781740.13	3308138.76	253.90
781	781787.68	3308123.30	254.17
782	781835.16	3308107.67	254.23
783	781882.00	3308090.18	254.24
784	781929.69	3308075.42	254.08
785	781978.17	3308063.17	254.02
786	782026.38	3308049.94	253.79
787	782075.03	3308039.19	253.58
788	782124.71	3308033.53	253.40
789	782166.11	3308058.97	253.17
790	782196.11	3308098.45	252.99
791	782226.43	3308138.19	252.84
792	782257.01	3308177.75	252.75
793	782288.06	3308216.95	252.68
794	782319.12	3308256.13	252.66
795	782350.17	3308295.32	252.64
796	782383.54	3308331.42	252.45

797	782429.87	3308350.22	252.43
798	782478.60	3308348.94	252.41
799	782527.99	3308341.20	252.39
800	782576.97	3308331.15	252.38
801	782625.95	3308321.10	252.40
802	782674.83	3308310.61	252.38
803	782723.70	3308300.02	252.33
804	782771.57	3308286.48	252.24
805	782816.88	3308265.34	252.24
806	782856.20	3308234.54	252.27
807	782895.26	3308203.33	252.23
808	782934.32	3308172.12	252.22
809	782973.42	3308140.94	252.61
810	783012.63	3308109.93	253.40
811	783051.85	3308078.91	253.83
812	783072.79	3308033.62	253.97
813	783093.41	3307988.06	254.10
814	783114.02	3307942.51	254.24
815	783132.24	3307895.96	254.56
816	783150.16	3307849.28	254.66
817	783168.08	3307802.60	254.65
818	783186.00	3307755.92	254.62
819	783203.71	3307709.16	254.49
820	783221.34	3307662.37	254.41
821	783238.96	3307615.58	254.27
822	783257.54	3307569.21	254.21
823	783279.84	3307524.46	254.21
824	783302.14	3307479.70	254.23
825	783325.69	3307435.63	254.20
826	783349.20	3307391.50	254.19
827	783372.71	3307347.38	254.13
828	783396.22	3307303.25	254.14
829	783423.49	3307261.42	254.11
830	783452.08	3307220.40	254.10
831	783480.67	3307179.38	254.05
832	783509.26	3307138.36	253.96
833	783537.85	3307097.34	253.90
834	783566.44	3307056.32	253.83
835	783587.10	3307010.91	253.78
836	783606.68	3306964.91	253.72
837	783626.26	3306918.90	253.66
838	783641.36	3306871.75	253.62
839	783646.12	3306821.98	253.64
840	783650.88	3306772.21	253.68
841	783655.65	3306722.43	253.73
842	783659.14	3306672.57	253.77
843	783661.86	3306622.64	253.63

844	783664.58	3306572.71	253.47
845	783667.31	3306522.79	253.08
846	783670.02	3306472.86	252.70
847	783672.40	3306422.92	252.12
848	783674.78	3306372.98	251.92
849	783679.90	3306323.56	251.77
850	783696.39	3306276.36	251.70
851	783712.88	3306229.16	251.62
852	783729.37	3306181.96	251.58
853	783742.26	3306133.95	251.54
854	783747.47	3306084.22	251.48
855	783752.68	3306034.49	251.46
856	783757.90	3305984.77	251.54
857	783763.11	3305935.04	251.56
858	783766.03	3305885.14	251.62
859	783768.36	3305835.19	251.55
860	783769.26	3305785.20	251.54
861	783769.84	3305735.21	251.55
862	783770.46	3305685.21	251.55
863	783774.23	3305635.35	251.55
864	783778.00	3305585.50	251.52
865	783786.35	3305536.54	251.52
866	783801.76	3305488.97	251.51
867	783817.16	3305441.40	251.48
868	783836.83	3305395.44	251.53
869	783856.52	3305349.48	251.49
870	783877.07	3305303.90	251.40
871	783898.18	3305258.58	251.33
872	783919.30	3305213.26	251.31
873	783949.06	3305173.14	251.26
874	783979.23	3305133.26	251.11
875	784012.52	3305096.33	250.96
876	784050.49	3305063.79	250.83
877	784088.90	3305031.92	250.67
878	784133.30	3305008.92	250.68
879	784177.69	3304985.92	250.66
880	784222.09	3304962.92	250.64
881	784269.86	3304948.45	250.59
882	784317.97	3304934.81	250.53
883	784366.07	3304921.17	250.41
884	784414.35	3304908.34	250.19
885	784463.68	3304900.18	250.02
886	784513.01	3304892.02	249.89
887	784562.34	3304883.86	249.78
888	784611.67	3304875.70	249.57
889	784661.00	3304867.54	249.42
890	784710.85	3304864.75	249.19

891	784760.83	3304863.29	249.10
892	784810.81	3304861.84	248.64
893	784860.78	3304860.60	248.32
894	784910.57	3304865.21	248.17
895	784960.35	3304869.83	246.08
896	785010.14	3304874.44	247.59
897	785059.93	3304879.06	247.83
898	785107.24	3304893.49	247.79
899	785153.27	3304913.02	246.00
900	785199.30	3304932.55	246.00
901	785238.77	3304962.04	248.03
902	785274.93	3304996.58	248.29
903	785308.34	3305033.32	249.14
904	785334.18	3305076.12	249.25
905	785360.03	3305118.92	249.31
906	785379.67	3305164.39	249.28
907	785392.95	3305212.59	249.29
908	785412.43	3305257.06	249.38
909	785447.74	3305290.53	249.52
910	785483.94	3305323.48	249.67
911	785529.19	3305340.61	249.76
912	785575.92	3305356.87	249.82
913	785625.46	3305350.06	249.78
914	785674.99	3305343.26	249.74
915	785720.00	3305321.82	249.77
916	785764.74	3305299.50	249.77
917	785802.92	3305267.35	249.73
918	785840.67	3305234.56	249.97
919	785878.42	3305201.77	250.14
920	785903.47	3305158.67	250.05
921	785927.88	3305115.03	249.94
922	785952.28	3305071.38	249.86
923	785976.37	3305027.59	249.77
924	785996.69	3304981.90	249.62
925	786012.75	3304936.36	249.36
926	786015.27	3304886.57	249.12
927	786015.87	3304836.60	249.06
928	786013.19	3304786.69	249.04
929	786012.53	3304736.73	249.16
930	786012.14	3304686.76	249.21
931	786014.91	3304636.86	249.09
932	786025.40	3304591.06	249.02
933	786027.02	3304543.52	248.86
934	786039.03	3304495.00	248.72
935	786057.72	3304449.10	248.70
936	786086.83	3304408.66	248.78
937	786124.67	3304376.84	248.77

938	786162.73	3304344.65	248.80
939	786199.41	3304310.67	248.78
940	786234.53	3304275.44	248.88
941	786259.78	3304232.28	248.89
942	786285.02	3304189.12	248.82
943	786310.48	3304146.09	248.74
944	786335.96	3304103.06	248.68
945	786356.53	3304057.59	248.58
946	786375.63	3304011.38	248.59
947	786400.91	3303968.27	248.54
948	786422.01	3303923.81	248.54
949	786427.49	3303874.11	248.50
950	786439.06	3303828.03	248.44
951	786440.56	3303778.68	248.44
952	786440.56	3303728.68	248.40
953	786432.29	3303682.60	248.38
954	786433.17	3303632.61	248.28
955	786410.84	3303588.42	248.32
956	786386.49	3303544.74	248.34
957	786358.11	3303504.02	248.35
958	786323.92	3303467.53	248.34
959	786289.73	3303431.05	248.37
960	786255.55	3303394.56	248.34
961	786221.57	3303357.88	248.24
962	786187.62	3303321.17	248.05
963	786153.66	3303284.47	247.81
964	786119.71	3303247.77	247.64
965	786090.59	3303207.21	247.61
966	786062.37	3303165.93	247.61
967	786034.15	3303124.66	247.57
968	786005.94	3303083.38	247.50
969	785977.13	3303042.55	247.39
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973	785849.77	3302888.34	246.46
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976	785796.72	3302749.59	244.50
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980	785723.79	3302565.96	247.53
981	785728.78	3302516.21	247.58
982	785733.77	3302466.46	247.66
983	785738.76	3302416.71	247.73
984	785747.10	3302367.99	247.73

985	785770.83	3302323.98	247.48
986	785794.56	3302279.96	247.29
987	785818.29	3302235.95	246.95
988	785842.01	3302191.94	246.65
989	785866.23	3302148.20	246.63
990	785890.73	3302104.61	246.67
991	785915.23	3302061.03	246.78
992	785939.73	3302017.44	246.85
993	785964.23	3301973.85	246.90
994	785995.69	3301936.37	247.04
995	786035.69	3301906.37	247.08
996	786084.40	3301896.32	247.08
997	786133.99	3301893.17	246.99
998	786183.92	3301895.71	246.82
999	786233.78	3301899.53	246.84
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1001	786296.92	3301959.80	246.97
1002	786305.04	3302006.79	247.00
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1004	786290.36	3302105.01	247.05
1005	786278.54	3302153.59	247.12
1006	786266.11	3302202.02	247.16
1007	786252.68	3302250.18	247.19
1008	786239.26	3302298.34	247.18
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1010	786224.76	3302395.45	246.85
1011	786232.03	3302444.92	246.51
1012	786239.30	3302494.39	246.16
1013	786257.94	3302538.79	245.92
1014	786289.87	3302577.27	245.78
1015	786321.79	3302615.75	245.57
1016	786356.83	3302650.83	245.47
1017	786397.96	3302679.27	244.00
1018	786439.08	3302707.71	244.00
1019	786488.18	3302702.82	245.70
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1021	786587.27	3302689.35	246.91
1022	786636.81	3302682.61	246.96
1023	786685.60	3302672.20	246.95
1024	786733.75	3302658.72	247.06
1025	786781.90	3302645.24	247.17
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1027	786878.20	3302618.29	247.43
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1040	787210.14	3302141.22	246.98
1041	787195.03	3302093.61	246.61
1042	787183.79	3302044.89	246.40
1043	787167.17	3301997.96	246.09
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1101	788147.52	3299479.67	245.29
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1103	788096.83	3299393.81	245.09
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1110	787888.54	3299113.19	244.43
1111	787854.72	3299076.37	243.99
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1113	787787.18	3299002.62	243.73
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1118	787619.74	3298816.98	244.66
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1120	787554.64	3298741.24	244.77
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1150	787599.27	3297372.15	243.29
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1189	787844.59	3295617.21	241.63
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1192	787974.57	3295548.46	241.67
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1222	787416.44	3294375.06	241.06
1223	787379.02	3294341.89	241.04
1224	787341.60	3294308.73	241.06
1225	787304.18	3294275.56	241.04
1226	787270.58	3294239.11	241.01
1227	787243.33	3294197.19	240.91
1228	787216.08	3294155.27	240.85
1229	787188.83	3294113.35	240.73
1230	787159.03	3294073.27	240.62
1231	787127.57	3294034.41	240.47
1232	787096.11	3293995.55	240.36
1233	787064.65	3293956.69	240.28
1234	787033.19	3293917.83	240.27
1235	787001.73	3293878.97	240.26
1236	786970.27	3293840.10	240.29
1237	786938.81	3293801.24	240.30
1238	786907.35	3293762.38	240.37
1239	786875.89	3293723.52	240.39
1240	786840.41	3293688.38	240.41
1241	786804.09	3293654.01	240.39
1242	786767.77	3293619.64	240.34
1243	786731.46	3293585.28	240.26
1244	786695.14	3293550.91	240.13
1245	786658.78	3293516.61	239.99
1246	786610.70	3293502.90	239.94
1247	786562.62	3293489.19	240.00
1248	786515.35	3293472.99	240.04
1249	786468.51	3293455.50	240.00
1250	786421.67	3293438.00	240.01
1251	786374.83	3293420.51	239.99
1252	786327.99	3293403.02	239.91
1253	786281.15	3293385.52	239.86
1254	786234.31	3293368.03	239.90
1255	786187.47	3293350.54	240.03
1256	786140.63	3293333.04	240.07
1257	786092.58	3293319.42	240.08
1258	786044.12	3293307.09	240.05
1259	785995.67	3293294.77	240.02
1260	785947.21	3293282.44	239.90
1261	785899.22	3293268.42	239.77
1262	785851.28	3293254.20	239.70
1263	785803.35	3293239.97	239.66
1264	785755.42	3293225.75	239.63
1265	785707.48	3293211.52	239.56
1266	785662.11	3293190.72	239.63

1267	785617.17	3293168.81	239.99
1268	785572.23	3293146.89	240.48
1269	785527.29	3293124.97	240.28
1270	785482.35	3293103.06	239.74
1271	785437.40	3293081.14	239.58
1272	785400.16	3293049.96	239.56
1273	785370.39	3293009.79	239.67
1274	785349.18	3292965.51	239.59
1275	785336.42	3292917.16	239.50
1276	785324.91	3292868.59	239.50
1277	785319.94	3292818.84	239.45
1278	785313.57	3292769.26	239.40
1279	785305.81	3292719.87	239.38
1280	785298.06	3292670.47	239.29
1281	785290.31	3292621.08	239.29
1282	785281.82	3292571.81	239.24
1283	785272.52	3292522.68	239.31
1284	785263.22	3292473.56	239.29
1285	785253.92	3292424.43	239.32
1286	785244.81	3292375.27	239.37
1287	785237.68	3292325.78	239.45
1288	785230.54	3292276.29	239.44
1289	785223.41	3292226.80	239.39
1290	785216.27	3292177.32	239.37
1291	785209.14	3292127.83	239.30
1292	785196.38	3292079.50	239.19
1293	785183.34	3292031.23	239.02
1294	785170.29	3291982.96	238.88
1295	785157.25	3291934.69	238.71
1296	785144.21	3291886.42	238.59
1297	785133.29	3291838.72	238.52
1298	785115.85	3291791.86	238.47
1299	785098.42	3291745.00	238.44
1300	785080.99	3291698.13	238.41
1301	785068.56	3291649.86	238.39
1302	785058.85	3291600.81	238.32
1303	785049.25	3291551.74	238.27
1304	785044.25	3291501.99	238.23
1305	785036.71	3291452.79	238.17
1306	785020.77	3291405.40	238.13
1307	785004.31	3291358.20	238.07
1308	784986.84	3291311.34	238.02
1309	784969.38	3291264.49	237.98
1310	784950.79	3291218.09	237.93
1311	784930.95	3291172.20	237.88
1312	784911.11	3291126.31	237.83
1313	784891.26	3291080.41	237.79

1314	784871.42	3291034.52	237.76
1315	784851.57	3290988.63	237.66
1316	784823.68	3290947.34	237.56
1317	784794.18	3290906.96	237.48
1318	784764.69	3290866.59	237.44
1319	784736.00	3290825.67	237.46
1320	784709.85	3290783.06	237.55
1321	784683.69	3290740.45	237.65
1322	784657.53	3290697.83	237.74
1323	784630.18	3290656.07	237.80
1324	784598.85	3290617.10	237.79
1325	784567.52	3290578.13	237.74
1326	784536.07	3290539.27	237.61
1327	784501.80	3290502.86	237.61
1328	784474.42	3290515.58	237.55
1329	784449.76	3290558.96	237.54
1330	784421.12	3290599.95	235.59
1331	784395.30	3290636.88	234.53

50 Year HFL Points			
S. No.	Right Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770483.92	3332677.99	301.83
2	770499.94	3332630.62	301.74
3	770518.25	3332584.28	301.59
4	770542.95	3332540.81	301.49
5	770569.43	3332498.41	301.45
6	770602.41	3332461.57	301.42
7	770641.28	3332430.15	301.90
8	770686.43	3332412.21	301.55
9	770736.28	3332410.90	302.20
10	770781.78	3332390.62	302.28
11	770821.37	3332360.58	302.20
12	770856.88	3332325.51	302.18
13	770890.05	3332288.09	302.24
14	770926.73	3332254.33	302.13
15	770965.40	3332222.64	302.25
16	771005.38	3332192.61	302.05
17	771045.77	3332163.15	301.73
18	771086.59	3332134.28	301.74
19	771127.29	3332105.24	301.45
20	771167.84	3332075.97	301.45
21	771207.11	3332045.03	300.66
22	771246.99	3332014.95	299.92
23	771288.08	3331986.60	299.86
24	771326.68	3331954.81	300.23
25	771366.63	3331924.75	300.43
26	771404.30	3331891.94	301.12
27	771434.11	3331852.13	302.41
28	771454.35	3331806.64	302.15
29	771478.25	3331763.77	302.29
30	771498.45	3331719.04	302.24
31	771517.48	3331672.85	301.75
32	771535.90	3331626.45	302.45
33	771558.74	3331581.99	302.56
34	771579.36	3331536.44	302.61
35	771598.46	3331490.23	302.90
36	771605.70	3331440.79	302.85
37	771605.62	3331390.90	301.66
38	771603.80	3331340.94	301.42
39	771597.55	3331291.40	302.33
40	771568.70	3331250.56	302.11
41	771532.20	3331219.38	301.72
42	771486.02	3331200.22	299.68
43	771440.00	3331180.67	299.16
44	771393.98	3331161.11	298.98

45	771348.43	3331140.53	298.67
46	771303.49	3331118.62	298.53
47	771258.63	3331096.53	298.36
48	771214.54	3331072.97	298.61
49	771170.44	3331049.40	298.26
50	771126.34	3331025.84	297.78
51	771080.34	3331006.29	297.65
52	771034.15	3330987.15	297.53
53	770987.95	3330968.02	297.41
54	770942.75	3330946.84	297.24
55	770899.09	3330922.48	297.14
56	770856.01	3330897.09	297.08
57	770813.12	3330871.42	297.09
58	770772.45	3330842.33	297.30
59	770731.78	3330813.24	297.21
60	770691.28	3330783.92	297.08
61	770650.78	3330754.60	296.96
62	770612.24	3330722.76	296.63
63	770576.85	3330687.52	296.49
64	770542.89	3330650.85	296.33
65	770510.53	3330612.73	296.21
66	770476.41	3330576.18	296.25
67	770442.44	3330539.49	296.69
68	770409.61	3330501.82	297.37
69	770378.49	3330462.69	297.62
70	770347.37	3330423.56	297.51
71	770315.84	3330384.75	297.50
72	770283.75	3330346.41	298.03
73	770256.82	3330304.28	298.49
74	770234.80	3330260.17	298.44
75	770226.49	3330210.89	298.43
76	770221.01	3330161.19	297.62
77	770221.29	3330111.29	297.35
78	770223.17	3330061.32	297.16
79	770226.99	3330011.47	297.10
80	770232.11	3329961.73	297.05
81	770240.49	3329912.54	296.99
82	770252.37	3329863.97	296.96
83	770268.22	3329816.55	296.95
84	770286.15	3329769.90	296.70
85	770306.36	3329724.20	296.53
86	770327.98	3329679.18	296.51
87	770353.12	3329636.70	295.91
88	770368.50	3329589.17	296.01
89	770387.61	3329543.05	295.69
90	770401.11	3329494.91	295.87
91	770417.24	3329447.59	295.87

92	770434.62	3329400.83	295.17
93	770435.79	3329352.61	294.21
94	770414.15	3329308.06	293.78
95	770383.79	3329268.75	293.54
96	770347.71	3329234.14	293.38
97	770314.46	3329196.79	293.21
98	770279.10	3329161.50	293.08
99	770246.21	3329123.92	292.89
100	770214.38	3329085.36	292.70
101	770183.13	3329046.33	292.52
102	770151.96	3329007.24	292.30
103	770119.95	3328968.83	292.11
104	770092.90	3328927.00	291.96
105	770065.97	3328884.87	291.80
106	770039.04	3328842.74	291.65
107	770014.86	3328798.98	291.56
108	769995.39	3328753.07	291.47
109	769972.68	3328708.53	291.38
110	769950.77	3328663.63	291.30
111	769932.99	3328616.90	291.24
112	769907.10	3328574.21	291.18
113	769880.47	3328531.89	291.12
114	769858.39	3328487.21	291.06
115	769837.71	3328441.69	290.97
116	769816.94	3328396.20	290.85
117	769800.44	3328349.08	290.74
118	769784.93	3328301.55	290.62
119	769768.26	3328254.42	290.51
120	769751.29	3328207.38	290.43
121	769734.03	3328160.46	290.36
122	769716.46	3328113.64	290.30
123	769699.75	3328066.58	290.31
124	769688.66	3328017.82	290.27
125	769677.47	3327969.09	290.24
126	769667.88	3327920.04	290.16
127	769659.10	3327870.85	290.12
128	769643.76	3327823.26	290.13
129	769632.30	3327774.63	290.14
130	769621.20	3327725.88	290.03
131	769605.72	3327678.49	289.96
132	769587.74	3327631.84	289.89
133	769568.62	3327585.69	289.70
134	769544.79	3327541.90	289.57
135	769524.27	3327496.32	289.44
136	769502.08	3327451.51	289.36
137	769478.74	3327407.30	289.32
138	769455.05	3327363.27	289.22

139	769425.20	3327323.70	289.34
140	769390.70	3327287.52	289.84
141	769359.05	3327248.91	290.14
142	769329.07	3327208.90	290.36
143	769298.90	3327169.02	290.56
144	769268.66	3327129.21	290.34
145	769239.43	3327088.70	290.05
146	769213.11	3327046.19	289.84
147	769177.83	3327011.10	290.05
148	769140.91	3326977.38	290.13
149	769106.97	3326940.82	290.28
150	769075.03	3326902.35	289.75
151	769041.09	3326865.85	290.69
152	769003.20	3326833.22	290.30
153	768962.96	3326803.59	289.93
154	768922.38	3326774.39	288.99
155	768887.95	3326738.92	288.22
156	768858.15	3326698.78	287.75
157	768829.27	3326657.96	287.46
158	768800.39	3326617.14	287.31
159	768795.61	3326567.66	287.00
160	768791.90	3326517.80	286.73
161	768759.24	3326480.89	286.67
162	768713.95	3326459.69	286.69
163	768669.21	3326437.46	286.83
164	768625.89	3326412.49	287.14
165	768585.51	3326383.11	287.40
166	768549.48	3326349.81	287.99
167	768528.95	3326304.23	288.56
168	768508.41	3326258.64	288.03
169	768494.90	3326210.51	288.13
170	768481.61	3326162.31	287.74
171	768468.31	3326114.11	287.78
172	768455.02	3326065.91	287.30
173	768432.00	3326021.73	287.07
174	768407.43	3325978.18	287.27
175	768380.20	3325936.28	287.07
176	768352.04	3325894.97	287.69
177	768323.88	3325853.65	287.66
178	768295.73	3325812.33	287.32
179	768265.80	3325772.30	286.76
180	768235.34	3325732.65	286.33
181	768204.87	3325693.00	286.88
182	768188.18	3325646.42	286.55
183	768174.47	3325598.33	286.77
184	768163.82	3325549.87	286.42
185	768165.52	3325499.90	286.47

186	768167.22	3325449.93	286.53
187	768168.93	3325399.96	286.43
188	768170.63	3325349.99	286.38
189	768172.88	3325300.04	286.40
190	768175.30	3325250.10	286.77
191	768177.72	3325200.16	285.97
192	768180.14	3325150.22	285.60
193	768182.56	3325100.28	285.45
194	768183.14	3325050.37	285.35
195	768178.83	3325000.56	285.34
196	768174.53	3324950.74	285.21
197	768169.44	3324901.03	285.13
198	768160.31	3324851.87	285.23
199	768151.17	3324802.72	285.26
200	768143.31	3324753.44	285.06
201	768143.00	3324703.44	284.77
202	768142.69	3324653.44	284.48
203	768150.90	3324604.43	284.18
204	768162.69	3324555.84	283.97
205	768174.48	3324507.25	283.83
206	768186.27	3324458.66	283.57
207	768204.57	3324412.40	283.36
208	768226.24	3324367.34	283.20
209	768247.91	3324322.28	283.12
210	768268.76	3324276.92	283.01
211	768290.27	3324231.78	282.93
212	768311.59	3324186.57	282.87
213	768325.96	3324138.68	282.78
214	768340.32	3324090.78	282.74
215	768354.69	3324042.89	282.67
216	768359.34	3323993.69	282.61
217	768358.18	3323943.70	282.55
218	768357.02	3323893.71	282.65
219	768355.63	3323843.76	282.50
220	768342.32	3323795.57	282.97
221	768329.00	3323747.37	283.63
222	768315.69	3323699.18	283.93
223	768296.99	3323653.05	284.02
224	768274.68	3323608.30	283.95
225	768252.80	3323563.40	283.77
226	768242.05	3323514.57	283.60
227	768231.29	3323465.74	283.19
228	768229.22	3323416.20	283.12
229	768231.92	3323366.28	283.14
230	768232.56	3323316.34	283.21
231	768230.32	3323266.39	282.87
232	768228.07	3323216.44	282.51

233	768222.21	3323166.80	282.15
234	768215.93	3323117.20	281.98
235	768209.66	3323067.59	281.87
236	768203.39	3323017.99	281.81
237	768202.21	3322968.57	281.76
238	768212.08	3322919.55	281.65
239	768221.95	3322870.53	281.49
240	768232.17	3322821.59	281.33
241	768243.00	3322772.78	281.17
242	768251.50	3322723.58	281.03
243	768256.87	3322673.87	280.87
244	768262.23	3322624.16	280.71
245	768252.43	3322575.47	280.61
246	768240.85	3322526.83	280.57
247	768229.27	3322478.19	280.54
248	768211.63	3322431.40	280.46
249	768193.98	3322384.62	280.38
250	768177.46	3322337.43	280.33
251	768161.13	3322290.17	280.29
252	768136.49	3322246.80	280.24
253	768112.12	3322203.24	280.17
254	768092.22	3322157.37	280.11
255	768071.36	3322111.94	280.04
256	768050.10	3322066.68	279.97
257	768029.86	3322020.96	279.91
258	768009.05	3321975.53	279.87
259	767983.91	3321932.31	279.82
260	767956.38	3321890.63	279.75
261	767927.44	3321849.85	279.69
262	767919.88	3321800.98	279.66
263	767914.34	3321751.30	279.61
264	767897.69	3321705.29	279.58
265	767881.88	3321657.86	279.51
266	767864.55	3321611.00	279.44
267	767845.08	3321564.94	279.38
268	767825.29	3321519.05	279.32
269	767800.24	3321475.78	279.32
270	767775.19	3321432.51	279.32
271	767755.71	3321386.59	279.37
272	767731.18	3321344.34	279.33
273	767724.30	3321295.29	279.26
274	767726.70	3321245.36	279.10
275	767747.90	3321201.47	279.01
276	767776.59	3321160.53	279.23
277	767816.93	3321131.21	282.62
278	767860.56	3321107.00	283.90
279	767905.39	3321084.87	284.37

280	767952.20	3321067.51	284.30
281	768001.34	3321059.06	285.20
282	768051.27	3321056.70	288.34
283	768101.22	3321058.43	290.11
284	768149.95	3321069.65	286.86
285	768198.78	3321080.37	285.18
286	768246.85	3321094.11	284.05
287	768294.31	3321109.82	281.56
288	768343.20	3321119.74	281.10
289	768392.79	3321126.14	280.20
290	768442.46	3321131.06	279.49
291	768492.45	3321129.96	279.30
292	768542.43	3321128.86	278.95
293	768592.42	3321127.76	278.69
294	768642.27	3321124.04	278.67
295	768692.08	3321119.68	278.59
296	768741.89	3321115.32	278.51
297	768791.69	3321110.96	278.38
298	768841.50	3321106.60	278.21
299	768891.31	3321102.24	278.10
300	768941.12	3321097.88	278.02
301	768989.45	3321087.38	277.94
302	769035.79	3321068.59	277.87
303	769082.13	3321049.80	277.77
304	769128.46	3321031.02	277.71
305	769174.80	3321012.23	277.66
306	769221.14	3320993.44	277.62
307	769266.38	3320972.42	277.57
308	769309.65	3320947.37	277.49
309	769352.92	3320922.32	277.46
310	769396.19	3320897.27	277.36
311	769439.46	3320872.21	277.21
312	769482.73	3320847.16	277.02
313	769526.00	3320822.11	276.83
314	769569.27	3320797.05	276.78
315	769612.54	3320772.00	276.85
316	769650.45	3320739.41	276.95
317	769688.25	3320706.69	277.00
318	769726.06	3320673.97	276.96
319	769763.87	3320641.25	276.83
320	769782.92	3320596.98	276.70
321	769795.12	3320548.50	276.62
322	769807.25	3320499.99	276.54
323	769818.50	3320451.27	276.49
324	769829.74	3320402.55	276.38
325	769834.15	3320352.79	276.24
326	769837.94	3320302.93	276.03

327	769841.74	3320253.08	275.79
328	769847.15	3320203.38	275.64
329	769853.27	3320153.76	275.53
330	769859.38	3320104.13	275.46
331	769867.36	3320054.78	275.47
332	769871.10	3320005.30	275.61
333	769868.83	3319955.35	275.73
334	769866.56	3319905.40	279.01
335	769864.29	3319855.46	285.63
336	769861.07	3319805.59	287.11
337	769855.09	3319755.94	287.24
338	769849.12	3319706.30	286.78
339	769844.01	3319656.56	282.12
340	769838.99	3319606.82	281.96
341	769834.46	3319557.02	280.31
342	769832.76	3319507.19	280.58
343	769835.95	3319457.29	280.10
344	769839.13	3319407.39	280.83
345	769855.36	3319360.31	280.21
346	769873.04	3319313.54	282.97
347	769888.39	3319265.97	279.64
348	769903.13	3319218.19	278.70
349	769922.69	3319172.42	280.49
350	769946.16	3319128.27	280.72
351	769978.77	3319090.61	278.69
352	770012.46	3319053.66	280.02
353	770049.40	3319020.05	279.74
354	770092.89	3318996.21	275.32
355	770141.07	3318982.91	274.58
356	770184.89	3318959.59	274.63
357	770227.08	3318934.91	274.61
358	770258.37	3318896.41	274.57
359	770267.84	3318848.15	274.60
360	770268.13	3318798.16	274.48
361	770265.22	3318749.27	274.27
362	770240.68	3318705.70	274.15
363	770214.47	3318663.12	274.13
364	770193.45	3318617.79	275.89
365	770194.43	3318568.84	276.91
366	770202.14	3318519.55	277.13
367	770218.30	3318472.48	275.79
368	770244.14	3318429.68	274.89
369	770275.53	3318390.97	274.50
370	770308.88	3318353.72	274.15
371	770344.63	3318318.85	273.52
372	770381.66	3318285.26	273.65
373	770420.42	3318253.88	273.56

374	770462.12	3318226.29	273.50
375	770504.25	3318199.37	273.34
376	770546.62	3318172.83	273.01
377	770582.57	3318138.42	272.86
378	770617.03	3318102.19	272.79
379	770651.49	3318065.96	272.70
380	770686.42	3318030.19	272.56
381	770719.75	3317993.10	272.43
382	770748.11	3317951.92	272.35
383	770775.44	3317910.07	272.30
384	770796.02	3317865.17	272.26
385	770802.78	3317815.72	272.25
386	770804.28	3317765.86	272.25
387	770801.81	3317715.93	272.28
388	770797.97	3317666.08	272.39
389	770787.41	3317617.27	272.37
390	770778.32	3317568.19	272.37
391	770773.03	3317518.48	272.25
392	770781.31	3317469.54	272.26
393	770791.13	3317420.59	272.30
394	770795.47	3317370.77	272.34
395	770804.13	3317321.63	272.30
396	770821.07	3317275.11	272.23
397	770845.37	3317231.59	272.14
398	770878.20	3317193.87	271.93
399	770909.44	3317154.85	271.55
400	770940.15	3317115.39	271.45
401	770970.13	3317075.38	271.33
402	771002.34	3317037.29	271.23
403	771037.64	3317001.88	271.10
404	771073.34	3316966.88	270.95
405	771099.93	3316926.38	270.79
406	771112.67	3316878.03	270.72
407	771125.15	3316829.61	270.75
408	771140.67	3316782.29	270.78
409	771161.21	3316736.72	270.75
410	771179.74	3316690.28	270.73
411	771207.47	3316649.26	270.73
412	771246.92	3316618.56	270.73
413	771285.89	3316587.23	270.71
414	771323.89	3316554.74	270.67
415	771362.68	3316523.21	270.64
416	771406.94	3316500.62	270.60
417	771453.07	3316481.53	270.56
418	771501.42	3316471.17	270.44
419	771550.65	3316474.38	270.17
420	771598.40	3316488.24	269.81

421	771646.61	3316501.27	269.54
422	771696.11	3316506.30	269.36
423	771742.04	3316488.19	269.21
424	771772.61	3316448.62	268.99
425	771803.18	3316409.05	268.65
426	771832.45	3316368.54	268.26
427	771855.49	3316325.51	268.13
428	771861.68	3316276.29	268.16
429	771882.72	3316231.07	268.19
430	771911.32	3316190.39	268.17
431	771943.01	3316151.72	268.26
432	771972.93	3316112.04	268.50
433	772005.60	3316074.34	268.59
434	772042.23	3316040.76	268.49
435	772080.48	3316008.57	268.36
436	772117.45	3315974.92	268.31
437	772155.55	3315942.57	268.29
438	772194.30	3315910.97	268.24
439	772232.85	3315879.14	268.14
440	772272.44	3315848.62	268.20
441	772313.21	3315819.69	268.26
442	772353.61	3315790.33	268.30
443	772391.33	3315757.51	268.27
444	772429.76	3315725.53	268.23
445	772468.24	3315693.65	268.11
446	772507.82	3315663.17	267.99
447	772548.13	3315633.86	267.90
448	772591.44	3315608.98	267.80
449	772634.01	3315582.75	267.72
450	772678.49	3315559.92	267.66
451	772722.26	3315535.85	267.59
452	772765.13	3315510.28	267.60
453	772811.15	3315491.34	267.63
454	772853.95	3315465.71	267.68
455	772898.03	3315442.10	267.69
456	772941.21	3315416.92	267.62
457	772983.79	3315390.74	267.41
458	773020.25	3315357.47	267.27
459	773044.98	3315314.31	267.19
460	773067.11	3315269.55	267.07
461	773091.27	3315225.82	266.99
462	773121.81	3315186.47	266.76
463	773123.66	3315139.03	266.68
464	773117.00	3315089.49	266.61
465	773110.01	3315039.99	266.57
466	773102.60	3314990.54	266.50
467	773096.50	3314941.01	266.39

468	773096.28	3314891.19	266.30
469	773091.72	3314841.40	266.12
470	773087.45	3314791.63	266.01
471	773088.79	3314741.65	265.95
472	773090.13	3314691.67	265.84
473	773092.56	3314641.74	265.80
474	773094.63	3314591.96	265.72
475	773095.01	3314541.99	265.69
476	773101.50	3314492.41	265.62
477	773107.99	3314442.83	265.54
478	773118.22	3314393.94	265.45
479	773127.47	3314344.95	265.38
480	773134.51	3314295.47	265.32
481	773144.26	3314246.43	265.19
482	773154.02	3314197.39	265.12
483	773166.71	3314149.04	265.04
484	773179.79	3314100.81	264.95
485	773192.63	3314052.49	264.80
486	773205.47	3314004.16	264.77
487	773219.50	3313956.19	264.72
488	773233.83	3313908.30	264.68
489	773249.05	3313861.19	264.67
490	773276.57	3313819.56	264.62
491	773301.94	3313776.82	264.76
492	773328.84	3313735.98	267.31
493	773368.49	3313705.71	266.90
494	773412.61	3313683.32	267.22
495	773460.29	3313668.30	268.93
496	773509.19	3313658.92	266.99
497	773559.05	3313655.90	267.06
498	773609.02	3313655.46	265.87
499	773658.96	3313657.87	268.01
500	773708.91	3313659.75	269.42
501	773758.44	3313665.99	268.25
502	773807.55	3313675.28	266.62
503	773857.40	3313679.20	268.17
504	773906.31	3313688.41	269.83
505	773953.85	3313703.72	268.44
506	774002.91	3313713.30	268.92
507	774052.28	3313721.16	264.65
508	774100.85	3313732.49	264.03
509	774150.00	3313741.48	264.00
510	774199.58	3313747.74	264.02
511	774249.40	3313745.68	264.11
512	774299.34	3313743.63	264.12
513	774349.22	3313742.11	264.07
514	774399.13	3313743.24	264.00

515	774448.98	3313739.97	264.02
516	774498.64	3313734.23	263.98
517	774547.99	3313726.44	263.96
518	774597.99	3313726.06	263.92
519	774647.86	3313723.93	263.89
520	774697.64	3313728.38	263.84
521	774746.49	3313738.87	263.80
522	774795.54	3313748.43	263.78
523	774845.13	3313754.83	263.75
524	774895.06	3313756.83	263.73
525	774944.96	3313758.82	263.63
526	774994.93	3313759.70	263.56
527	775044.88	3313761.92	263.39
528	775094.79	3313764.55	263.25
529	775144.65	3313767.94	263.03
530	775194.26	3313773.74	262.95
531	775243.83	3313780.16	262.95
532	775293.66	3313784.30	262.95
533	775343.49	3313788.39	262.92
534	775393.34	3313792.28	262.88
535	775443.12	3313796.88	262.81
536	775492.80	3313802.50	262.71
537	775542.44	3313808.39	262.53
538	775592.31	3313811.83	262.37
539	775642.28	3313812.60	262.26
540	775692.27	3313811.61	262.20
541	775742.27	3313811.39	262.19
542	775792.26	3313810.70	262.19
543	775841.66	3313803.20	262.24
544	775891.00	3313795.10	262.29
545	775933.55	3313769.44	262.26
546	775973.34	3313739.79	262.22
547	776005.75	3313701.71	262.20
548	776026.28	3313656.34	262.17
549	776043.39	3313609.41	262.15
550	776041.92	3313562.12	262.03
551	776017.81	3313519.54	261.88
552	775983.02	3313483.63	261.75
553	775945.76	3313450.33	261.69
554	775908.62	3313416.89	261.68
555	775872.77	3313382.03	261.75
556	775840.37	3313344.19	261.89
557	775811.01	3313303.72	262.08
558	775784.49	3313262.06	262.12
559	775771.74	3313213.99	262.04
560	775780.12	3313164.92	261.91
561	775787.64	3313115.71	261.80

562	775798.70	3313066.97	261.71
563	775818.82	3313021.50	261.58
564	775834.60	3312974.44	261.46
565	775850.58	3312927.37	261.36
566	775876.28	3312884.57	261.22
567	775898.05	3312839.76	261.15
568	775924.60	3312797.64	260.96
569	775952.76	3312756.46	260.89
570	775983.67	3312717.56	260.79
571	776023.01	3312687.36	260.69
572	776067.11	3312665.03	260.57
573	776114.03	3312649.06	260.47
574	776160.95	3312632.76	260.44
575	776208.59	3312619.06	260.41
576	776256.27	3312604.74	260.38
577	776300.10	3312582.04	260.32
578	776341.55	3312554.50	260.22
579	776381.30	3312525.18	260.14
580	776417.03	3312491.50	260.04
581	776442.67	3312449.36	260.03
582	776470.71	3312408.74	260.08
583	776495.99	3312366.04	260.11
584	776524.77	3312325.51	260.08
585	776551.89	3312283.86	260.04
586	776587.76	3312250.05	259.98
587	776619.64	3312211.76	259.90
588	776643.36	3312168.33	259.84
589	776671.76	3312127.79	259.77
590	776695.88	3312084.30	259.68
591	776713.67	3312037.89	259.57
592	776731.88	3311991.75	259.44
593	776748.25	3311944.50	259.31
594	776764.63	3311897.26	259.16
595	776781.00	3311850.02	259.06
596	776798.75	3311803.68	258.91
597	776806.09	3311755.48	258.95
598	776817.77	3311707.40	258.67
599	776830.51	3311659.67	258.69
600	776846.69	3311613.52	259.13
601	776868.66	3311569.25	258.71
602	776903.38	3311534.22	258.59
603	776936.72	3311497.27	258.62
604	776967.03	3311457.81	259.65
605	777005.04	3311426.96	259.25
606	777039.29	3311391.06	258.34
607	777077.21	3311359.17	258.38
608	777112.80	3311325.03	258.39

609	777152.02	3311294.76	258.32
610	777191.04	3311264.51	258.35
611	777224.85	3311228.29	258.42
612	777257.79	3311191.02	258.16
613	777292.27	3311155.11	258.12
614	777327.45	3311120.43	258.25
615	777363.32	3311085.97	258.30
616	777393.52	3311047.10	258.29
617	777427.07	3311010.86	258.12
618	777441.07	3310963.74	258.08
619	777452.77	3310915.75	258.09
620	777469.74	3310869.18	258.00
621	777497.16	3310828.64	257.87
622	777530.65	3310791.86	257.75
623	777564.74	3310755.93	257.66
624	777605.66	3310729.43	257.50
625	777649.35	3310706.64	257.51
626	777693.47	3310684.14	257.11
627	777737.23	3310661.00	257.11
628	777779.46	3310635.45	257.10
629	777821.67	3310609.95	257.12
630	777863.37	3310583.61	257.09
631	777905.72	3310558.11	257.01
632	777943.59	3310526.24	256.96
633	777984.93	3310499.11	256.95
634	778028.87	3310475.66	257.00
635	778071.82	3310451.07	257.42
636	778114.28	3310425.64	257.50
637	778149.57	3310391.27	257.27
638	778184.13	3310355.53	257.01
639	778214.13	3310316.49	257.21
640	778253.06	3310285.76	256.81
641	778294.50	3310258.78	256.80
642	778335.52	3310231.43	256.98
643	778379.01	3310207.79	257.35
644	778421.33	3310182.05	257.51
645	778466.57	3310161.68	257.36
646	778511.25	3310140.08	257.23
647	778555.91	3310118.74	256.91
648	778597.54	3310092.49	257.01
649	778631.30	3310056.85	256.80
650	778653.42	3310013.05	257.74
651	778678.47	3309970.24	258.48
652	778706.45	3309929.31	258.10
653	778740.87	3309893.66	258.20
654	778776.17	3309859.17	257.88
655	778818.51	3309833.77	257.56

656	778858.36	3309803.95	257.12
657	778899.12	3309775.72	256.92
658	778942.23	3309751.32	256.74
659	778986.79	3309730.49	256.62
660	779029.26	3309704.93	256.55
661	779073.37	3309682.75	256.48
662	779106.85	3309646.74	256.44
663	779141.61	3309611.20	256.60
664	779174.16	3309574.28	256.63
665	779213.10	3309544.23	256.57
666	779249.68	3309510.39	256.44
667	779286.30	3309476.34	256.16
668	779319.78	3309439.99	255.47
669	779360.16	3309411.58	255.34
670	779391.32	3309373.76	255.35
671	779426.92	3309342.02	255.31
672	779460.57	3309305.73	255.58
673	779499.68	3309275.27	255.69
674	779533.63	3309239.66	255.75
675	779573.00	3309211.07	255.48
676	779607.35	3309176.26	260.14
677	779648.50	3309148.81	261.62
678	779688.16	3309119.04	256.79
679	779725.19	3309086.66	254.46
680	779763.74	3309056.90	256.33
681	779806.85	3309033.08	254.51
682	779851.16	3309012.18	254.32
683	779892.78	3308985.49	254.35
684	779934.68	3308959.30	255.10
685	779977.04	3308933.94	255.31
686	780018.18	3308906.43	255.34
687	780058.39	3308878.44	255.75
688	780093.60	3308843.63	255.66
689	780134.20	3308815.61	256.19
690	780177.74	3308794.34	255.81
691	780225.19	3308779.99	255.95
692	780272.09	3308764.96	254.14
693	780318.42	3308747.99	253.78
694	780361.60	3308723.98	253.70
695	780402.68	3308695.81	253.73
696	780447.94	3308674.59	253.72
697	780492.86	3308652.63	253.75
698	780537.69	3308630.49	253.90
699	780581.83	3308607.00	253.98
700	780624.82	3308581.49	254.19
701	780667.64	3308555.68	254.30
702	780710.97	3308530.72	254.59

703	780754.59	3308506.29	254.65
704	780798.16	3308481.76	254.67
705	780841.67	3308457.14	254.67
706	780885.19	3308432.51	254.67
707	780928.19	3308407.00	254.70
708	780971.18	3308381.46	254.68
709	781014.16	3308355.92	254.28
710	781056.77	3308329.77	254.17
711	781099.04	3308303.06	253.84
712	781141.28	3308276.31	253.70
713	781183.39	3308249.34	253.71
714	781225.49	3308222.37	253.62
715	781269.52	3308198.78	253.50
716	781313.17	3308174.48	253.53
717	781355.88	3308148.48	253.54
718	781398.84	3308122.91	253.58
719	781442.04	3308097.73	253.55
720	781485.24	3308072.55	253.46
721	781528.58	3308047.61	253.23
722	781571.96	3308022.75	253.12
723	781615.16	3307997.57	253.09
724	781658.26	3307972.23	253.11
725	781702.95	3307949.86	253.02
726	781747.88	3307927.92	252.88
727	781791.97	3307904.35	252.80
728	781835.84	3307880.35	252.73
729	781882.53	3307862.52	252.61
730	781928.93	3307843.93	252.47
731	781974.98	3307824.44	252.51
732	782020.57	3307803.94	252.60
733	782065.63	3307782.28	253.23
734	782110.42	3307760.12	253.56
735	782153.02	3307733.94	253.58
736	782194.82	3307706.53	253.70
737	782236.19	3307678.44	253.91
738	782277.58	3307650.39	254.20
739	782320.00	3307623.93	254.23
740	782362.42	3307597.46	254.19
741	782404.81	3307570.96	254.14
742	782433.43	3307529.96	254.18
743	782462.05	3307488.96	253.95
744	782490.67	3307447.96	253.58
745	782515.54	3307404.82	253.25
746	782536.42	3307359.39	253.27
747	782557.30	3307313.96	253.27
748	782573.80	3307266.79	253.18
749	782589.68	3307219.38	253.18

750	782604.05	3307171.52	252.96
751	782616.34	3307123.06	252.51
752	782609.34	3307074.71	252.67
753	782596.47	3307026.39	252.84
754	782582.68	3306978.33	252.86
755	782568.88	3306930.27	252.99
756	782555.09	3306882.21	253.01
757	782542.94	3306833.80	252.99
758	782535.73	3306784.32	253.10
759	782534.84	3306734.88	253.24
760	782542.60	3306685.49	253.45
761	782550.36	3306636.09	253.23
762	782558.12	3306586.70	253.31
763	782565.88	3306537.30	253.17
764	782579.22	3306489.12	252.75
765	782592.65	3306440.96	252.71
766	782606.07	3306392.79	252.73
767	782619.50	3306344.63	252.66
768	782627.00	3306295.28	252.68
769	782627.15	3306245.33	252.69
770	782626.51	3306195.33	252.68
771	782625.86	3306145.34	252.76
772	782621.09	3306095.58	252.61
773	782615.92	3306045.85	252.55
774	782612.45	3305996.14	252.52
775	782618.60	3305946.52	252.21
776	782624.76	3305896.90	252.04
777	782630.92	3305847.28	251.90
778	782637.40	3305797.72	251.93
779	782650.09	3305749.36	251.34
780	782662.77	3305700.99	251.53
781	782675.46	3305652.63	251.59
782	782689.11	3305604.53	251.89
783	782702.75	3305556.43	252.29
784	782717.53	3305508.71	252.36
785	782736.30	3305462.37	252.39
786	782755.06	3305416.02	252.47
787	782773.83	3305369.68	252.53
788	782795.41	3305324.77	252.63
789	782822.01	3305282.43	252.65
790	782848.61	3305240.10	252.68
791	782881.06	3305202.48	252.39
792	782916.80	3305167.51	252.32
793	782954.37	3305134.75	252.29
794	782995.25	3305105.95	252.25
795	783036.12	3305077.15	252.26
796	783075.56	3305046.42	252.38

797	783114.85	3305015.51	252.37
798	783154.15	3304984.59	252.25
799	783190.68	3304950.54	252.05
800	783226.28	3304915.43	251.92
801	783264.83	3304883.64	251.67
802	783303.85	3304852.37	251.45
803	783342.87	3304821.11	251.37
804	783383.02	3304791.60	251.40
805	783427.67	3304769.11	251.42
806	783472.33	3304746.62	251.49
807	783518.24	3304728.48	251.35
808	783568.01	3304723.66	250.93
809	783617.84	3304719.73	250.67
810	783667.80	3304717.83	249.50
811	783717.44	3304712.52	249.23
812	783764.90	3304697.63	249.05
813	783802.69	3304667.11	248.89
814	783835.12	3304629.05	248.86
815	783862.32	3304588.29	248.74
816	783874.65	3304539.83	248.69
817	783915.78	3304515.56	248.62
818	783961.37	3304495.04	248.63
819	784006.97	3304474.51	248.58
820	784052.56	3304453.99	248.67
821	784098.99	3304435.54	248.96
822	784146.02	3304418.54	250.32
823	784193.04	3304401.54	250.54
824	784240.06	3304384.54	250.81
825	784287.90	3304370.98	251.10
826	784337.53	3304364.93	251.23
827	784387.17	3304358.88	251.08
828	784436.49	3304358.65	251.12
829	784485.21	3304369.90	250.82
830	784533.93	3304381.15	250.58
831	784583.33	3304387.78	250.05
832	784633.22	3304391.16	249.92
833	784683.10	3304394.53	249.74
834	784733.02	3304396.96	249.50
835	784783.02	3304397.22	249.30
836	784833.02	3304397.49	249.42
837	784883.02	3304397.76	249.57
838	784932.99	3304399.37	249.61
839	784982.94	3304401.57	249.58
840	785032.89	3304403.78	249.51
841	785082.84	3304405.99	249.37
842	785132.79	3304408.19	249.60
843	785182.71	3304410.85	249.66

844	785232.36	3304416.69	249.66
845	785282.02	3304422.53	249.65
846	785331.68	3304428.38	249.64
847	785381.22	3304435.02	249.60
848	785430.52	3304443.37	249.47
849	785480.03	3304443.94	249.35
850	785529.70	3304438.24	249.21
851	785578.94	3304430.57	249.07
852	785624.71	3304412.11	248.96
853	785660.01	3304376.70	248.86
854	785685.31	3304333.80	248.70
855	785707.70	3304289.33	248.65
856	785718.83	3304240.59	248.66
857	785723.52	3304191.01	248.68
858	785739.43	3304143.61	248.77
859	785755.34	3304096.21	248.77
860	785778.77	3304052.29	248.72
861	785804.67	3304009.52	248.55
862	785833.07	3303968.39	248.31
863	785859.75	3303926.34	248.00
864	785878.62	3303880.04	247.79
865	785889.65	3303831.47	247.74
866	785898.22	3303782.22	247.68
867	785903.43	3303732.49	247.63
868	785908.64	3303682.76	247.50
869	785906.43	3303633.17	247.61
870	785899.43	3303583.66	247.62
871	785892.44	3303534.15	247.44
872	785881.04	3303485.82	247.24
873	785861.75	3303439.74	247.13
874	785834.36	3303398.78	247.16
875	785792.60	3303371.43	247.27
876	785754.57	3303339.10	247.48
877	785724.61	3303299.07	247.53
878	785698.99	3303256.24	247.54
879	785675.71	3303212.00	247.48
880	785653.43	3303167.25	247.45
881	785630.99	3303122.67	247.34
882	785609.35	3303077.82	247.33
883	785582.73	3303035.54	247.56
884	785561.29	3302990.37	247.72
885	785539.85	3302945.20	247.79
886	785518.41	3302900.03	247.68
887	785498.08	3302854.37	247.57
888	785479.90	3302807.83	247.49
889	785467.00	3302759.52	247.44
890	785464.20	3302709.75	247.38

891	785462.83	3302659.77	247.45
892	785461.47	3302609.79	247.54
893	785460.10	3302559.81	247.68
894	785460.43	3302509.82	247.75
895	785461.36	3302459.83	247.74
896	785468.33	3302410.54	247.67
897	785479.24	3302361.75	247.50
898	785491.61	3302313.30	247.24
899	785503.97	3302264.86	247.06
900	785516.34	3302216.41	246.97
901	785532.57	3302169.23	246.86
902	785551.17	3302122.81	246.70
903	785569.77	3302076.40	246.88
904	785592.85	3302032.11	247.27
905	785616.95	3301988.30	247.37
906	785641.06	3301944.50	247.36
907	785663.41	3301899.80	247.21
908	785684.44	3301854.44	246.68
909	785705.47	3301809.08	246.37
910	785732.20	3301766.88	246.05
911	785759.57	3301725.04	245.79
912	785786.94	3301683.19	245.82
913	785814.31	3301641.35	245.87
914	785839.50	3301598.22	246.42
915	785862.83	3301554.00	246.64
916	785886.16	3301509.78	246.54
917	785909.50	3301465.55	246.47
918	785943.93	3301431.52	246.39
919	785986.00	3301404.51	246.29
920	786028.08	3301377.50	246.23
921	786070.16	3301350.49	246.19
922	786112.23	3301323.48	246.17
923	786155.12	3301298.07	246.13
924	786201.85	3301280.29	246.12
925	786248.58	3301262.51	246.14
926	786295.31	3301244.73	246.17
927	786342.04	3301226.94	246.12
928	786389.59	3301212.03	245.95
929	786438.68	3301202.55	245.87
930	786487.78	3301193.08	245.92
931	786536.87	3301183.60	246.01
932	786586.06	3301174.66	246.16
933	786635.48	3301167.12	246.28
934	786684.91	3301159.57	246.25
935	786734.34	3301152.03	245.96
936	786783.46	3301142.77	245.49
937	786832.38	3301132.47	245.45

938	786879.49	3301116.39	245.45
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940	786959.84	3301059.37	245.45
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943	786998.19	3300918.74	245.66
944	787002.93	3300869.11	245.67
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947	786989.22	3300720.97	245.65
948	786991.76	3300671.60	245.53
949	786997.47	3300621.94	245.31
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951	787006.38	3300522.33	245.23
952	787031.58	3300480.09	245.41
953	787060.19	3300439.08	245.52
954	787092.11	3300401.11	245.54
955	787130.59	3300369.19	245.38
956	787169.43	3300337.78	245.18
957	787212.77	3300312.86	245.05
958	787256.12	3300287.94	244.80
959	787304.45	3300277.59	244.43
960	787351.77	3300264.67	244.38
961	787394.21	3300238.24	244.31
962	787432.07	3300205.59	244.17
963	787467.17	3300171.16	243.87
964	787479.99	3300122.83	243.59
965	787492.81	3300074.50	242.43
966	787499.05	3300024.97	243.44
967	787504.07	3299975.23	243.50
968	787509.08	3299925.48	243.52
969	787515.39	3299875.88	241.75
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971	787524.03	3299776.77	244.08
972	787517.30	3299727.23	244.26
973	787503.02	3299679.32	244.67
974	787488.73	3299631.40	244.50
975	787472.68	3299584.06	244.59
976	787456.00	3299536.93	244.60
977	787436.52	3299490.96	244.61
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982	787315.00	3299274.71	245.11
983	787278.81	3299240.23	244.83
984	787240.88	3299207.65	244.69

985	787202.95	3299175.07	244.66
986	787165.02	3299142.49	244.55
987	787127.03	3299109.98	244.40
988	787088.55	3299078.06	244.24
989	787050.06	3299046.14	244.06
990	787011.58	3299014.22	243.82
991	786973.10	3298982.30	243.70
992	786934.61	3298950.37	243.64
993	786896.13	3298918.45	243.66
994	786857.65	3298886.53	243.65
995	786819.16	3298854.61	243.59
996	786780.60	3298822.78	243.60
997	786741.92	3298791.10	243.63
998	786703.23	3298759.42	243.72
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1001	786587.18	3298664.39	244.08
1002	786548.50	3298632.71	243.93
1003	786509.58	3298601.32	243.83
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1011	786199.44	3298348.73	243.34
1012	786160.92	3298316.85	243.40
1013	786123.29	3298283.93	243.20
1014	786086.19	3298250.42	242.97
1015	786049.08	3298216.90	242.84
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1134	785405.01	3294050.76	239.60
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1137	785334.66	3293918.37	239.66
1138	785309.95	3293874.91	239.59
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1142	785244.91	3293687.64	239.41
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1144	785198.30	3293599.16	239.33
1145	785180.36	3293552.56	239.38
1146	785163.36	3293505.54	239.52
1147	785147.41	3293458.19	239.75
1148	785134.60	3293409.86	239.90
1149	785121.78	3293361.53	239.91
1150	785116.93	3293311.97	239.83
1151	785114.15	3293262.07	239.72
1152	785108.11	3293212.43	239.54
1153	785101.37	3293162.93	239.50
1154	785088.65	3293114.58	239.44
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1156	785063.22	3293017.87	239.50
1157	785050.41	3292969.54	239.58
1158	785037.48	3292921.24	239.54
1159	785024.56	3292872.93	239.55
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1167	784900.05	3292493.18	239.22
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1171	784844.70	3292301.57	238.61
1172	784826.01	3292255.20	238.44

1173	784810.35	3292207.85	238.22
1174	784798.47	3292159.28	238.13
1175	784784.67	3292111.26	238.05
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1179	784725.07	3291920.38	237.95
1180	784709.43	3291872.92	237.84
1181	784692.44	3291825.89	237.83
1182	784675.16	3291778.98	237.78
1183	784654.97	3291733.33	237.73
1184	784627.65	3291691.45	237.71
1185	784595.02	3291654.33	237.67
1186	784559.52	3291619.12	237.63
1187	784524.03	3291583.91	237.51
1188	784488.53	3291548.69	237.43
1189	784452.93	3291513.58	237.44
1190	784417.12	3291478.69	237.44
1191	784381.78	3291443.47	237.47
1192	784361.40	3291397.81	237.47
1193	784341.03	3291352.15	237.52
1194	784320.66	3291306.49	237.56
1195	784300.28	3291260.83	237.61
1196	784281.26	3291214.59	237.65
1197	784262.65	3291168.19	237.71
1198	784244.03	3291121.78	237.71
1199	784226.84	3291074.95	237.71
1200	784216.91	3291025.95	237.71
1201	784206.98	3290976.94	237.71
1202	784196.31	3290928.10	237.72
1203	784186.95	3290879.13	237.70
1204	784187.65	3290829.14	237.69
1205	784187.95	3290808.43	237.70

50 Year HFL Points			
S. No.	Left Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770709.21	3332807.99	301.83
2	770736.97	3332766.40	301.74
3	770764.84	3332724.89	301.59
4	770792.93	3332683.52	301.49
5	770820.68	3332641.94	301.45
6	770847.60	3332599.80	301.42
7	770875.84	3332558.57	301.90
8	770908.75	3332521.23	301.55
9	770945.46	3332487.27	302.20
10	770983.95	3332455.40	302.28
11	771022.71	3332423.81	302.20
12	771061.46	3332392.21	302.18
13	771100.21	3332360.62	302.24
14	771138.99	3332329.06	302.13
15	771178.76	3332298.75	302.25
16	771218.52	3332268.44	302.05
17	771258.29	3332238.13	301.73
18	771298.05	3332207.82	301.74
19	771338.46	3332178.39	301.45
20	771379.73	3332150.16	301.45
21	771420.96	3332121.88	300.66
22	771462.19	3332093.61	299.92
23	771503.54	3332065.58	299.86
24	771538.32	3332030.33	300.23
25	771568.37	3331990.37	300.43
26	771596.58	3331949.09	301.12
27	771620.02	3331904.96	302.41
28	771643.10	3331860.60	302.15
29	771662.08	3331814.37	302.29
30	771684.71	3331770.37	302.24
31	771709.66	3331727.11	301.75
32	771732.20	3331682.94	302.45
33	771758.29	3331640.71	302.56
34	771780.96	3331596.46	302.61
35	771793.24	3331548.50	302.90
36	771805.25	3331500.59	302.85
37	771804.74	3331450.70	301.66
38	771790.80	3331402.84	301.42
39	771779.83	3331354.44	302.33
40	771762.02	3331308.07	302.11
41	771742.29	3331262.36	301.72
42	771717.60	3331219.80	299.68
43	771692.24	3331176.71	299.16
44	771663.48	3331136.24	298.98

45	771631.64	3331098.25	298.67
46	771593.41	3331067.18	298.53
47	771549.84	3331043.37	298.36
48	771505.47	3331021.49	298.61
49	771465.89	3330991.67	298.26
50	771421.31	3330969.85	297.78
51	771375.02	3330952.06	297.65
52	771327.31	3330938.19	297.53
53	771281.96	3330917.89	297.41
54	771239.80	3330891.17	297.24
55	771193.22	3330873.40	297.14
56	771146.98	3330855.22	297.08
57	771102.85	3330831.98	297.09
58	771057.56	3330811.31	297.30
59	771012.53	3330790.08	297.21
60	770967.15	3330769.80	297.08
61	770922.78	3330746.75	296.96
62	770878.41	3330723.70	296.63
63	770834.25	3330700.25	296.49
64	770790.84	3330675.52	296.33
65	770748.66	3330648.67	296.21
66	770707.32	3330620.55	296.25
67	770667.07	3330591.16	296.69
68	770634.62	3330553.17	297.37
69	770602.66	3330514.72	297.62
70	770570.70	3330476.27	297.51
71	770538.73	3330437.82	297.50
72	770506.02	3330400.02	298.03
73	770472.85	3330362.61	298.49
74	770439.68	3330325.20	298.44
75	770415.25	3330282.69	298.43
76	770399.57	3330235.28	297.62
77	770397.33	3330185.33	297.35
78	770400.37	3330135.86	297.16
79	770411.39	3330087.09	297.10
80	770422.41	3330038.32	297.05
81	770436.39	3329990.32	296.99
82	770448.69	3329941.92	296.96
83	770479.67	3329909.41	296.95
84	770527.97	3329916.64	296.70
85	770574.61	3329934.07	296.53
86	770620.74	3329952.79	296.51
87	770666.79	3329970.21	295.91
88	770714.82	3329982.45	296.01
89	770764.64	3329986.61	295.69
90	770814.59	3329986.81	295.87
91	770864.58	3329985.78	295.87

92	770914.46	3329983.56	295.17
93	770964.39	3329980.98	294.21
94	771013.91	3329974.82	293.78
95	771063.09	3329965.81	293.54
96	771102.67	3329937.73	293.38
97	771136.96	3329901.60	293.21
98	771166.54	3329861.29	293.08
99	771189.33	3329817.35	292.89
100	771206.32	3329770.33	292.70
101	771223.30	3329723.30	292.52
102	771236.12	3329675.54	292.30
103	771236.26	3329625.54	292.11
104	771234.34	3329575.78	291.96
105	771220.45	3329527.74	291.80
106	771206.57	3329479.71	291.65
107	771191.71	3329431.97	291.56
108	771176.79	3329384.25	291.47
109	771161.93	3329336.53	291.38
110	771144.33	3329289.73	291.30
111	771126.72	3329242.93	291.24
112	771109.12	3329196.14	291.18
113	771089.30	3329150.24	291.12
114	771069.08	3329104.51	291.06
115	771048.87	3329058.78	290.97
116	771028.60	3329013.07	290.85
117	771007.30	3328967.84	290.74
118	770986.00	3328922.60	290.62
119	770962.10	3328878.76	290.51
120	770936.11	3328836.05	290.43
121	770910.12	3328793.34	290.36
122	770884.12	3328750.62	290.30
123	770858.13	3328707.91	290.31
124	770832.14	3328665.20	290.27
125	770803.77	3328624.14	290.24
126	770772.76	3328584.92	290.16
127	770741.75	3328545.70	290.12
128	770708.20	3328508.94	290.13
129	770669.95	3328476.74	290.14
130	770631.62	3328444.62	290.03
131	770593.22	3328412.60	289.96
132	770554.82	3328380.58	289.89
133	770516.42	3328348.56	289.70
134	770476.09	3328319.04	289.57
135	770435.46	3328289.89	289.44
136	770405.58	3328250.23	289.36
137	770377.12	3328209.12	289.32
138	770353.05	3328165.30	289.22

139	770331.37	3328120.61	289.34
140	770304.51	3328078.44	289.84
141	770277.66	3328036.26	290.14
142	770250.80	3327994.08	290.36
143	770221.38	3327953.75	290.56
144	770187.10	3327917.53	290.34
145	770151.34	3327883.19	290.05
146	770114.52	3327849.37	289.84
147	770082.63	3327810.92	290.05
148	770060.11	3327766.70	290.13
149	770045.26	3327719.64	290.28
150	770042.58	3327670.17	289.75
151	770046.91	3327620.46	290.69
152	770024.85	3327575.59	290.30
153	770002.14	3327531.08	289.93
154	769975.40	3327488.83	288.99
155	769948.66	3327446.59	288.22
156	769920.75	3327405.12	287.75
157	769892.05	3327364.17	287.46
158	769863.35	3327323.23	287.31
159	769834.65	3327282.29	287.00
160	769805.95	3327241.34	286.73
161	769776.50	3327200.95	286.67
162	769745.94	3327161.38	286.69
163	769715.38	3327121.81	286.83
164	769684.81	3327082.23	287.14
165	769654.25	3327042.66	287.40
166	769623.69	3327003.09	287.99
167	769593.45	3326963.28	288.56
168	769564.51	3326922.51	288.03
169	769535.56	3326881.74	288.13
170	769506.62	3326840.97	287.74
171	769477.67	3326800.20	287.78
172	769454.49	3326756.23	287.30
173	769435.03	3326710.18	287.07
174	769414.68	3326664.50	287.27
175	769393.04	3326619.62	287.07
176	769361.86	3326580.53	287.69
177	769342.33	3326534.76	287.66
178	769327.71	3326487.38	287.32
179	769313.61	3326439.41	286.76
180	769303.03	3326390.73	286.33
181	769296.53	3326341.15	286.88
182	769290.03	3326291.58	286.55
183	769283.53	3326242.00	286.77
184	769274.03	3326192.96	286.42
185	769263.24	3326144.13	286.47

186	769253.93	3326095.20	286.53
187	769240.05	3326047.33	286.43
188	769224.76	3325999.72	286.38
189	769208.52	3325952.44	286.40
190	769192.25	3325905.16	286.77
191	769175.98	3325857.88	285.97
192	769159.71	3325810.60	285.60
193	769143.43	3325763.32	285.45
194	769127.16	3325716.05	285.35
195	769110.89	3325668.77	285.34
196	769094.62	3325621.49	285.21
197	769078.34	3325574.21	285.13
198	769063.20	3325526.56	285.23
199	769048.12	3325478.89	285.26
200	769033.04	3325431.22	285.06
201	769020.89	3325382.98	284.77
202	769009.75	3325334.24	284.48
203	768998.62	3325285.49	284.18
204	768987.48	3325236.75	283.97
205	768976.34	3325188.00	283.83
206	768965.21	3325139.26	283.57
207	768954.07	3325090.52	283.36
208	768942.93	3325041.77	283.20
209	768931.79	3324993.03	283.12
210	768920.66	3324944.28	283.01
211	768902.94	3324897.83	282.93
212	768881.45	3324852.68	282.87
213	768858.29	3324808.58	282.78
214	768826.86	3324769.70	282.74
215	768795.42	3324730.82	282.67
216	768756.51	3324699.70	282.61
217	768716.58	3324669.61	282.55
218	768676.65	3324639.52	282.65
219	768639.48	3324607.33	282.50
220	768621.30	3324560.76	282.97
221	768603.36	3324514.33	283.63
222	768581.70	3324469.27	283.93
223	768565.29	3324422.74	284.02
224	768563.18	3324372.78	283.95
225	768561.07	3324322.83	283.77
226	768563.86	3324272.98	283.60
227	768568.15	3324223.16	283.19
228	768572.96	3324173.42	283.12
229	768578.27	3324123.70	283.14
230	768583.45	3324073.97	283.21
231	768588.27	3324024.20	282.87
232	768589.27	3323974.37	282.51

233	768585.99	3323924.48	282.15
234	768582.70	3323874.59	281.98
235	768579.42	3323824.70	281.87
236	768580.68	3323774.73	281.81
237	768582.26	3323724.75	281.76
238	768579.74	3323674.92	281.65
239	768574.63	3323625.19	281.49
240	768569.53	3323575.45	281.33
241	768570.80	3323525.91	281.17
242	768572.52	3323475.94	281.03
243	768574.24	3323425.97	280.87
244	768576.52	3323376.16	280.71
245	768571.53	3323326.43	280.61
246	768566.67	3323276.66	280.57
247	768561.81	3323226.90	280.54
248	768556.96	3323177.14	280.46
249	768556.38	3323127.21	280.38
250	768557.54	3323077.23	280.33
251	768558.27	3323027.27	280.29
252	768550.91	3322977.81	280.24
253	768543.54	3322928.36	280.17
254	768534.06	3322879.28	280.11
255	768523.96	3322830.31	280.04
256	768513.87	3322781.34	279.97
257	768503.77	3322732.37	279.91
258	768493.23	3322683.49	279.87
259	768482.62	3322634.63	279.82
260	768466.93	3322587.24	279.75
261	768449.80	3322540.26	279.69
262	768432.68	3322493.29	279.66
263	768415.56	3322446.31	279.61
264	768401.88	3322398.30	279.58
265	768390.28	3322349.66	279.51
266	768378.68	3322301.03	279.44
267	768366.18	3322252.62	279.38
268	768353.25	3322204.32	279.32
269	768340.32	3322156.02	279.32
270	768327.39	3322107.72	279.32
271	768316.93	3322058.89	279.37
272	768308.92	3322009.54	279.33
273	768300.90	3321960.18	279.26
274	768292.89	3321910.83	279.10
275	768284.88	3321861.48	279.01
276	768277.86	3321811.97	279.23
277	768270.92	3321762.46	282.62
278	768262.04	3321713.27	283.90
279	768252.08	3321664.28	284.37

280	768242.12	3321615.28	284.30
281	768242.07	3321566.33	285.20
282	768252.53	3321517.44	288.34
283	768262.98	3321468.54	290.11
284	768269.95	3321419.04	286.86
285	768299.04	3321380.12	285.18
286	768344.17	3321362.83	284.05
287	768392.98	3321351.98	281.56
288	768442.64	3321346.62	281.10
289	768492.43	3321342.07	280.20
290	768542.36	3321339.40	279.49
291	768592.29	3321336.78	279.30
292	768642.06	3321341.10	278.95
293	768691.82	3321346.00	278.69
294	768741.61	3321350.65	278.67
295	768791.39	3321355.30	278.59
296	768841.17	3321359.95	278.51
297	768890.96	3321364.60	278.38
298	768940.72	3321369.50	278.21
299	768990.51	3321373.51	278.10
300	769040.48	3321372.03	278.02
301	769090.46	3321370.55	277.94
302	769140.44	3321369.07	277.87
303	769190.42	3321367.59	277.77
304	769240.40	3321366.11	277.71
305	769290.14	3321362.27	277.66
306	769339.42	3321353.81	277.62
307	769388.69	3321345.34	277.57
308	769437.97	3321336.87	277.49
309	769487.25	3321328.41	277.46
310	769536.45	3321319.60	277.36
311	769584.37	3321305.35	277.21
312	769632.30	3321291.10	277.02
313	769680.23	3321276.85	276.83
314	769729.38	3321268.11	276.78
315	769778.83	3321260.75	276.85
316	769828.29	3321253.39	276.95
317	769877.84	3321252.93	277.00
318	769927.48	3321258.89	276.96
319	769977.13	3321264.85	276.83
320	770024.48	3321279.71	276.70
321	770070.84	3321298.45	276.62
322	770117.59	3321316.07	276.54
323	770165.81	3321327.65	276.49
324	770215.68	3321331.29	276.38
325	770264.09	3321320.97	276.24
326	770311.02	3321304.18	276.03

327	770356.15	3321282.67	275.79
328	770395.44	3321255.02	275.64
329	770419.04	3321210.94	275.53
330	770442.64	3321166.86	275.46
331	770448.26	3321117.32	275.47
332	770453.17	3321067.56	275.61
333	770458.08	3321017.80	275.73
334	770454.08	3320968.38	279.01
335	770449.82	3320918.57	285.63
336	770445.55	3320868.75	287.11
337	770441.53	3320818.92	287.24
338	770433.32	3320769.86	286.78
339	770421.64	3320721.24	282.12
340	770409.95	3320672.63	281.96
341	770398.27	3320624.01	280.31
342	770384.21	3320576.18	280.58
343	770364.26	3320530.33	280.10
344	770344.30	3320484.49	280.83
345	770324.35	3320438.64	280.21
346	770292.14	3320401.58	282.97
347	770255.16	3320367.92	279.64
348	770223.03	3320330.13	278.70
349	770195.64	3320288.30	280.49
350	770168.25	3320246.47	280.72
351	770154.81	3320198.71	278.69
352	770143.72	3320149.96	280.02
353	770132.64	3320101.20	279.74
354	770121.56	3320052.45	275.32
355	770118.30	3320002.75	274.58
356	770117.50	3319952.75	274.63
357	770116.70	3319902.76	274.61
358	770115.90	3319852.77	274.57
359	770115.07	3319803.11	274.60
360	770115.30	3319753.11	274.48
361	770114.19	3319703.14	274.27
362	770111.94	3319653.19	274.15
363	770109.69	3319603.24	274.13
364	770107.44	3319553.29	275.89
365	770113.68	3319504.16	276.91
366	770125.55	3319455.59	277.13
367	770137.42	3319407.02	275.79
368	770149.38	3319358.47	274.89
369	770161.36	3319309.93	274.50
370	770187.72	3319268.25	274.15
371	770219.39	3319229.96	273.52
372	770260.97	3319202.19	273.65
373	770305.70	3319181.30	273.56

374	770352.54	3319163.81	273.50
375	770399.97	3319152.68	273.34
376	770449.23	3319161.24	273.01
377	770498.13	3319171.10	272.86
378	770544.74	3319189.19	272.79
379	770592.69	3319202.28	272.70
380	770641.53	3319204.50	272.56
381	770688.07	3319186.25	272.43
382	770734.62	3319167.99	272.35
383	770780.05	3319147.17	272.30
384	770825.03	3319125.34	272.26
385	770861.51	3319093.36	272.25
386	770890.85	3319052.88	272.25
387	770918.98	3319011.62	272.28
388	770943.51	3318968.05	272.39
389	770968.04	3318924.48	272.37
390	770983.48	3318877.70	272.37
391	770991.75	3318828.39	272.25
392	770986.50	3318779.65	272.26
393	770974.09	3318731.21	272.30
394	770958.33	3318684.32	272.34
395	770929.55	3318643.44	272.30
396	770894.66	3318608.35	272.23
397	770854.02	3318579.50	272.14
398	770809.86	3318556.04	271.93
399	770763.90	3318536.38	271.55
400	770738.56	3318494.88	271.45
401	770736.23	3318446.36	271.33
402	770755.41	3318401.28	271.23
403	770779.04	3318357.23	271.10
404	770806.00	3318315.70	270.95
405	770833.79	3318274.14	270.79
406	770861.59	3318232.57	270.72
407	770891.20	3318192.35	270.75
408	770922.50	3318153.35	270.78
409	770942.32	3318107.58	270.75
410	770963.03	3318062.11	270.73
411	770985.63	3318017.51	270.73
412	771006.99	3317972.31	270.73
413	771023.61	3317925.58	270.71
414	771035.39	3317877.28	270.67
415	771050.77	3317830.25	270.64
416	771052.85	3317780.30	270.60
417	771054.92	3317730.34	270.56
418	771050.36	3317680.78	270.44
419	771041.84	3317631.52	270.17
420	771032.76	3317582.37	269.81

421	771038.58	3317533.05	269.54
422	771047.97	3317483.96	269.36
423	771059.22	3317435.24	269.21
424	771071.49	3317386.81	268.99
425	771087.15	3317339.32	268.65
426	771107.69	3317293.80	268.26
427	771135.82	3317252.77	268.13
428	771166.70	3317213.44	268.16
429	771197.57	3317174.11	268.19
430	771228.45	3317134.78	268.17
431	771249.66	3317090.06	268.26
432	771266.46	3317043.06	268.50
433	771269.00	3316993.14	268.59
434	771289.41	3316947.66	268.49
435	771310.63	3316902.39	268.36
436	771337.00	3316860.04	268.31
437	771367.12	3316820.80	268.29
438	771409.66	3316794.51	268.24
439	771455.12	3316773.96	268.14
440	771502.12	3316757.37	268.20
441	771551.01	3316747.46	268.26
442	771600.93	3316750.20	268.30
443	771650.64	3316755.39	268.27
444	771700.40	3316758.74	268.23
445	771750.37	3316756.91	268.11
446	771800.31	3316754.58	267.99
447	771850.03	3316750.77	267.90
448	771897.13	3316735.74	267.80
449	771934.31	3316702.31	267.72
450	771967.81	3316665.42	267.66
451	772002.21	3316630.58	267.59
452	772048.09	3316610.71	267.60
453	772093.97	3316590.84	267.63
454	772135.42	3316563.23	267.68
455	772168.17	3316525.49	267.69
456	772198.98	3316486.10	267.62
457	772220.80	3316441.99	267.41
458	772251.32	3316402.40	267.27
459	772281.03	3316362.23	267.19
460	772309.37	3316321.09	267.07
461	772339.31	3316281.18	266.99
462	772372.29	3316243.72	266.76
463	772408.32	3316209.18	266.68
464	772446.14	3316176.58	266.61
465	772486.61	3316147.32	266.57
466	772527.62	3316118.87	266.50
467	772568.79	3316090.53	266.39

468	772609.34	3316061.33	266.30
469	772650.88	3316033.62	266.12
470	772691.04	3316003.91	266.01
471	772731.53	3315974.57	265.95
472	772772.26	3315945.57	265.84
473	772814.38	3315918.76	265.80
474	772857.28	3315893.07	265.72
475	772900.07	3315867.21	265.69
476	772942.91	3315841.42	265.62
477	772988.70	3315821.97	265.54
478	773034.86	3315802.83	265.45
479	773080.58	3315782.66	265.38
480	773126.31	3315763.91	265.32
481	773147.94	3315719.68	265.19
482	773165.67	3315673.10	265.12
483	773188.52	3315628.63	265.04
484	773209.21	3315583.14	264.95
485	773228.70	3315537.10	264.80
486	773242.62	3315489.56	264.77
487	773248.84	3315439.95	264.72
488	773253.49	3315390.31	264.68
489	773252.27	3315340.33	264.67
490	773252.43	3315290.40	264.62
491	773256.44	3315240.56	264.76
492	773265.69	3315191.63	267.31
493	773285.40	3315145.68	266.90
494	773304.53	3315099.48	267.22
495	773323.70	3315053.30	268.93
496	773342.12	3315006.83	266.99
497	773357.72	3314959.38	267.06
498	773373.24	3314911.92	265.87
499	773392.74	3314865.90	268.01
500	773410.38	3314819.13	269.42
501	773433.18	3314774.82	268.25
502	773465.18	3314737.49	266.62
503	773494.74	3314697.42	268.17
504	773524.24	3314657.12	269.83
505	773541.66	3314610.81	268.44
506	773545.14	3314561.33	268.92
507	773539.59	3314511.69	264.65
508	773526.70	3314463.38	264.03
509	773519.85	3314414.04	264.00
510	773525.54	3314364.36	264.02
511	773527.60	3314314.51	264.11
512	773527.85	3314264.56	264.12
513	773530.94	3314214.71	264.07
514	773529.23	3314164.73	264.00

515	773525.05	3314114.95	264.02
516	773527.52	3314066.00	263.98
517	773545.08	3314019.67	263.96
518	773573.77	3313978.82	263.92
519	773602.12	3313938.58	263.89
520	773646.79	3313917.51	263.84
521	773695.66	3313906.96	263.80
522	773744.45	3313896.06	263.78
523	773792.68	3313883.13	263.75
524	773842.68	3313883.40	263.73
525	773892.68	3313883.67	263.63
526	773942.67	3313884.17	263.56
527	773992.58	3313887.07	263.39
528	774042.38	3313891.46	263.25
529	774091.75	3313898.98	263.03
530	774140.75	3313908.93	262.95
531	774189.75	3313918.88	262.95
532	774239.15	3313925.77	262.95
533	774288.94	3313929.81	262.92
534	774338.27	3313938.01	262.88
535	774387.59	3313946.20	262.81
536	774436.92	3313954.40	262.71
537	774486.24	3313962.60	262.53
538	774535.56	3313970.78	262.37
539	774584.59	3313979.71	262.26
540	774629.15	3314002.40	262.20
541	774673.70	3314025.09	262.19
542	774717.85	3314048.56	262.19
543	774761.07	3314073.66	262.24
544	774804.48	3314098.47	262.29
545	774848.40	3314122.37	262.26
546	774894.71	3314141.08	262.22
547	774941.31	3314159.22	262.20
548	774987.90	3314177.35	262.17
549	775034.37	3314195.80	262.15
550	775081.09	3314213.42	262.03
551	775129.36	3314226.39	261.88
552	775177.73	3314238.94	261.75
553	775226.97	3314247.66	261.69
554	775275.98	3314257.53	261.68
555	775325.54	3314263.95	261.75
556	775375.17	3314270.01	261.89
557	775424.68	3314276.97	262.08
558	775474.49	3314280.60	262.12
559	775524.43	3314282.99	262.04
560	775574.43	3314283.03	261.91
561	775624.20	3314280.58	261.80

562	775673.24	3314270.82	261.71
563	775723.00	3314266.38	261.58
564	775772.86	3314262.70	261.46
565	775819.52	3314246.81	261.36
566	775866.58	3314230.07	261.22
567	775914.02	3314214.27	261.15
568	775955.51	3314188.18	260.96
569	775994.01	3314156.28	260.89
570	776033.97	3314126.32	260.79
571	776074.46	3314096.99	260.69
572	776101.55	3314056.01	260.57
573	776134.22	3314019.22	260.47
574	776171.91	3313986.36	260.44
575	776209.38	3313953.30	260.41
576	776248.24	3313921.85	260.38
577	776287.11	3313890.39	260.32
578	776325.97	3313858.94	260.22
579	776358.67	3313821.76	260.14
580	776387.09	3313780.63	260.04
581	776410.61	3313736.71	260.03
582	776431.32	3313691.20	260.08
583	776448.13	3313644.63	260.11
584	776467.44	3313598.51	260.08
585	776486.75	3313552.39	260.04
586	776501.39	3313505.01	259.98
587	776507.81	3313455.43	259.90
588	776513.62	3313405.81	259.84
589	776510.87	3313355.89	259.77
590	776500.94	3313307.69	259.68
591	776478.24	3313263.20	259.57
592	776433.93	3313240.04	259.44
593	776387.41	3313221.72	259.31
594	776340.88	3313203.41	259.16
595	776311.24	3313164.47	259.06
596	776289.86	3313119.67	258.91
597	776273.91	3313072.33	258.95
598	776268.87	3313022.58	258.67
599	776280.77	3312974.69	258.69
600	776314.67	3312938.86	259.13
601	776356.67	3312912.77	258.71
602	776401.86	3312891.38	258.59
603	776447.06	3312870.00	258.62
604	776492.12	3312848.34	259.65
605	776537.07	3312826.43	259.25
606	776581.13	3312802.85	258.34
607	776624.44	3312777.88	258.38
608	776665.06	3312749.86	258.39

609	776695.08	3312709.87	258.32
610	776720.05	3312667.22	258.35
611	776736.07	3312619.86	258.42
612	776745.26	3312571.05	258.16
613	776749.85	3312521.26	258.12
614	776757.19	3312471.84	258.25
615	776765.98	3312422.62	258.30
616	776783.41	3312376.63	258.29
617	776811.31	3312335.14	258.12
618	776837.97	3312292.88	258.08
619	776862.82	3312249.49	258.09
620	776887.67	3312206.10	258.00
621	776912.41	3312162.66	257.87
622	776936.55	3312118.87	257.75
623	776960.69	3312075.08	257.66
624	776980.44	3312029.23	257.50
625	776998.73	3311982.70	257.51
626	777017.93	3311936.53	257.11
627	777037.13	3311890.37	257.11
628	777059.25	3311845.59	257.10
629	777083.10	3311801.65	257.12
630	777115.22	3311763.58	257.09
631	777159.04	3311739.84	257.01
632	777205.21	3311720.87	256.96
633	777252.65	3311705.79	256.95
634	777302.34	3311700.21	257.00
635	777352.03	3311694.64	257.42
636	777401.72	3311689.06	257.50
637	777446.34	3311668.84	257.27
638	777490.25	3311644.92	257.01
639	777532.99	3311619.02	257.21
640	777575.27	3311592.32	256.81
641	777610.81	3311558.41	256.80
642	777638.87	3311517.48	256.98
643	777657.93	3311471.29	257.35
644	777677.77	3311425.40	257.51
645	777682.31	3311376.33	257.36
646	777681.60	3311326.34	257.23
647	777677.34	3311276.55	256.91
648	777668.69	3311227.63	257.01
649	777652.40	3311180.35	256.80
650	777639.14	3311132.18	257.74
651	777628.88	3311083.26	258.48
652	777621.53	3311034.67	258.10
653	777651.01	3310994.28	258.20
654	777684.39	3310957.25	257.88
655	777719.87	3310922.01	257.56

656	777755.50	3310886.98	257.12
657	777797.78	3310860.28	256.92
658	777839.00	3310832.01	256.74
659	777879.61	3310802.84	256.62
660	777917.40	3310770.38	256.55
661	777952.39	3310734.67	256.48
662	777990.27	3310702.26	256.44
663	778030.28	3310672.26	256.60
664	778069.31	3310641.13	256.63
665	778105.84	3310607.16	256.57
666	778146.91	3310578.64	256.44
667	778187.52	3310549.48	256.16
668	778229.21	3310521.87	255.47
669	778270.89	3310494.25	255.34
670	778311.25	3310464.82	255.35
671	778350.35	3310433.66	255.31
672	778389.34	3310402.35	255.58
673	778429.22	3310372.21	255.69
674	778473.14	3310348.51	255.75
675	778519.20	3310329.06	255.48
676	778560.13	3310300.49	260.14
677	778602.08	3310273.30	261.62
678	778641.82	3310243.39	256.79
679	778676.78	3310207.66	254.46
680	778716.09	3310177.59	256.33
681	778758.27	3310150.74	254.51
682	778800.45	3310123.90	254.32
683	778843.46	3310098.41	254.35
684	778887.98	3310075.68	255.10
685	778930.02	3310048.69	255.31
686	778970.65	3310019.56	255.34
687	779010.48	3309989.35	255.75
688	779050.01	3309958.73	255.66
689	779089.54	3309928.11	256.19
690	779128.57	3309896.86	255.81
691	779167.47	3309865.45	255.95
692	779206.56	3309834.28	254.14
693	779248.65	3309807.53	253.78
694	779293.19	3309784.81	253.70
695	779337.73	3309762.08	253.73
696	779382.11	3309739.10	253.72
697	779423.72	3309711.36	253.75
698	779464.93	3309683.05	253.90
699	779506.15	3309654.75	253.98
700	779547.36	3309626.44	254.19
701	779586.30	3309595.26	254.30
702	779624.29	3309562.84	254.59

703	779662.88	3309531.05	254.65
704	779701.48	3309499.27	254.67
705	779741.90	3309470.01	254.67
706	779782.55	3309441.04	254.67
707	779821.45	3309409.63	254.70
708	779860.35	3309378.22	254.68
709	779899.85	3309347.56	254.28
710	779939.37	3309316.92	254.17
711	779978.88	3309286.28	253.84
712	780018.39	3309255.64	253.70
713	780057.89	3309224.98	253.71
714	780097.38	3309194.33	253.62
715	780137.63	3309164.67	253.50
716	780178.08	3309135.27	253.53
717	780218.52	3309105.87	253.54
718	780257.68	3309074.79	253.58
719	780292.03	3309038.54	253.55
720	780326.48	3309002.32	253.46
721	780361.84	3308966.98	253.23
722	780397.52	3308931.95	253.12
723	780432.91	3308896.63	253.09
724	780468.31	3308861.32	253.11
725	780503.71	3308826.29	253.02
726	780541.43	3308793.68	252.88
727	780581.19	3308763.60	252.80
728	780622.14	3308734.92	252.73
729	780661.58	3308704.24	252.61
730	780703.40	3308676.84	252.47
731	780747.85	3308654.72	252.51
732	780794.93	3308637.89	252.60
733	780840.82	3308618.12	253.23
734	780886.08	3308596.90	253.56
735	780930.69	3308574.30	253.58
736	780975.29	3308551.71	253.70
737	781019.90	3308529.11	253.91
738	781064.49	3308506.50	254.20
739	781107.82	3308481.60	254.23
740	781150.69	3308455.87	254.19
741	781193.56	3308430.13	254.14
742	781236.43	3308404.40	254.18
743	781279.34	3308378.74	253.95
744	781322.30	3308353.15	253.58
745	781365.25	3308327.55	253.25
746	781408.36	3308302.23	253.27
747	781451.49	3308276.93	253.27
748	781494.77	3308251.91	253.18
749	781539.45	3308229.47	253.18

750	781584.13	3308207.02	252.96
751	781631.13	3308190.21	252.51
752	781678.63	3308174.59	252.67
753	781727.88	3308166.91	252.84
754	781775.82	3308153.84	252.86
755	781822.78	3308136.66	252.99
756	781869.73	3308119.48	253.01
757	781918.03	3308106.86	252.99
758	781966.84	3308096.04	253.10
759	782015.84	3308086.06	253.24
760	782064.62	3308075.09	253.45
761	782112.92	3308078.86	253.23
762	782147.19	3308114.71	253.31
763	782181.86	3308150.71	253.17
764	782211.92	3308190.41	252.75
765	782239.47	3308232.13	252.71
766	782266.09	3308274.46	252.73
767	782293.82	3308316.03	252.66
768	782330.66	3308348.77	252.68
769	782372.62	3308375.94	252.69
770	782416.83	3308399.04	252.68
771	782466.58	3308394.03	252.76
772	782516.12	3308387.34	252.61
773	782565.58	3308380.03	252.55
774	782614.99	3308372.43	252.52
775	782663.89	3308361.98	252.21
776	782712.78	3308351.52	252.04
777	782761.99	3308342.73	251.90
778	782810.58	3308331.96	251.93
779	782856.48	3308312.14	251.34
780	782902.14	3308291.77	251.53
781	782947.46	3308270.66	251.59
782	782990.66	3308245.50	251.89
783	783031.89	3308217.30	252.29
784	783072.30	3308187.86	252.36
785	783105.73	3308152.78	252.39
786	783126.01	3308107.08	252.47
787	783146.29	3308061.37	252.53
788	783166.56	3308015.67	252.63
789	783186.84	3307969.97	252.65
790	783207.12	3307924.27	252.68
791	783226.70	3307878.26	252.39
792	783245.56	3307831.96	252.32
793	783264.42	3307785.65	252.29
794	783283.28	3307739.34	252.25
795	783302.13	3307693.04	252.26
796	783322.94	3307647.64	252.38

797	783346.60	3307603.60	252.37
798	783370.26	3307559.55	252.25
799	783393.91	3307515.50	252.05
800	783417.57	3307471.45	251.92
801	783441.23	3307427.40	251.67
802	783465.00	3307383.41	251.45
803	783489.04	3307339.57	251.37
804	783513.09	3307295.73	251.40
805	783537.14	3307251.90	251.42
806	783561.18	3307208.06	251.49
807	783585.23	3307164.22	251.35
808	783609.28	3307120.38	250.93
809	783633.42	3307076.60	250.67
810	783657.62	3307032.85	249.50
811	783681.82	3306989.09	249.23
812	783706.02	3306945.34	249.05
813	783730.22	3306901.58	248.89
814	783742.37	3306854.20	248.86
815	783746.39	3306804.36	248.74
816	783750.41	3306754.52	248.69
817	783754.43	3306704.68	248.62
818	783758.45	3306654.85	248.63
819	783761.16	3306604.92	248.58
820	783763.85	3306554.99	248.67
821	783766.55	3306505.06	248.96
822	783769.25	3306455.14	250.32
823	783771.95	3306405.21	250.54
824	783774.86	3306355.30	250.81
825	783779.12	3306305.48	251.10
826	783783.38	3306255.66	251.23
827	783788.52	3306205.95	251.08
828	783796.07	3306156.52	251.12
829	783803.62	3306107.10	250.82
830	783811.17	3306057.67	250.58
831	783818.72	3306008.24	250.05
832	783826.28	3305958.82	249.92
833	783834.04	3305909.42	249.74
834	783842.12	3305860.08	249.50
835	783850.20	3305810.74	249.30
836	783858.29	3305761.40	249.42
837	783866.37	3305712.05	249.57
838	783874.13	3305662.66	249.61
839	783881.75	3305613.24	249.58
840	783889.38	3305563.83	249.51
841	783898.97	3305514.96	249.37
842	783918.01	3305468.73	249.60
843	783937.05	3305422.50	249.66

844	783956.09	3305376.26	249.66
845	783976.76	3305330.75	249.65
846	783998.14	3305285.55	249.64
847	784019.51	3305240.35	249.60
848	784040.88	3305195.15	249.47
849	784073.01	3305156.86	249.35
850	784105.27	3305118.66	249.21
851	784138.40	3305081.25	249.07
852	784173.40	3305045.55	248.96
853	784210.11	3305012.48	248.86
854	784257.04	3304995.22	248.70
855	784303.96	3304977.95	248.65
856	784352.34	3304965.52	248.66
857	784400.98	3304953.90	248.68
858	784449.83	3304943.32	248.77
859	784498.99	3304934.19	248.77
860	784548.15	3304925.06	248.72
861	784597.51	3304917.24	248.55
862	784647.14	3304911.20	248.31
863	784696.78	3304905.16	248.00
864	784746.76	3304904.46	247.79
865	784796.76	3304903.95	247.74
866	784846.75	3304903.45	247.68
867	784896.75	3304902.95	247.63
868	784946.16	3304909.54	247.50
869	784995.37	3304918.35	247.61
870	785044.77	3304925.92	247.62
871	785094.49	3304931.16	247.44
872	785142.15	3304943.09	247.24
873	785186.16	3304966.82	247.13
874	785219.85	3305003.62	247.16
875	785253.16	3305040.91	247.27
876	785286.46	3305078.21	247.48
877	785314.50	3305119.01	247.53
878	785336.07	3305164.11	247.54
879	785358.54	3305208.65	247.48
880	785390.80	3305246.85	247.45
881	785423.94	3305284.27	247.34
882	785460.86	3305317.53	247.33
883	785503.29	3305343.41	247.56
884	785550.36	3305360.29	247.72
885	785599.36	3305364.90	247.79
886	785648.50	3305355.66	247.68
887	785696.61	3305342.28	247.57
888	785740.10	3305317.61	247.49
889	785783.60	3305292.95	247.44
890	785827.09	3305268.28	247.38

891	785861.57	3305232.66	247.45
892	785894.14	3305194.73	247.54
893	785920.50	3305152.47	247.68
894	785944.72	3305108.73	247.75
895	785968.94	3305064.99	247.74
896	785993.16	3305021.25	247.67
897	786013.67	3304975.78	247.50
898	786021.77	3304926.63	247.24
899	786022.26	3304876.63	247.06
900	786022.76	3304826.63	246.97
901	786022.02	3304776.65	246.86
902	786020.32	3304726.68	246.70
903	786022.42	3304676.73	246.88
904	786030.39	3304627.53	247.27
905	786039.56	3304579.17	247.37
906	786041.36	3304529.27	247.36
907	786051.23	3304480.40	247.21
908	786077.73	3304438.00	246.68
909	786109.74	3304400.47	246.37
910	786149.06	3304369.69	246.05
911	786187.94	3304338.38	245.79
912	786221.05	3304300.91	245.82
913	786256.33	3304265.51	245.87
914	786282.51	3304222.92	246.42
915	786308.24	3304180.06	246.64
916	786331.64	3304135.88	246.54
917	786355.55	3304091.98	246.47
918	786380.60	3304048.70	246.39
919	786400.54	3304003.01	246.29
920	786419.22	3303956.64	246.23
921	786439.48	3303911.05	246.19
922	786447.55	3303861.71	246.17
923	786455.75	3303812.39	246.13
924	786462.80	3303763.01	246.12
925	786461.28	3303713.04	246.14
926	786456.13	3303663.49	246.17
927	786445.42	3303614.72	246.12
928	786417.93	3303572.96	245.95
929	786388.10	3303532.85	245.87
930	786357.86	3303493.03	245.92
931	786327.62	3303453.21	246.01
932	786297.38	3303413.39	246.16
933	786266.97	3303373.71	246.28
934	786233.62	3303336.46	246.25
935	786200.27	3303299.20	245.96
936	786166.92	3303261.95	245.49
937	786133.57	3303224.70	245.45

938	786101.30	3303186.58	245.45
939	786071.83	3303146.18	245.45
940	786042.36	3303105.79	245.45
941	786012.90	3303065.39	245.47
942	785983.84	3303024.71	245.56
943	785955.14	3302983.76	245.66
944	785926.44	3302942.82	245.67
945	785897.74	3302901.88	245.67
946	785871.22	3302859.52	245.68
947	785845.65	3302816.56	245.65
948	785824.67	3302771.55	245.53
949	785809.88	3302723.79	245.31
950	785795.08	3302676.03	245.20
951	785780.94	3302628.07	245.23
952	785767.14	3302580.01	245.41
953	785763.94	3302530.89	245.52
954	785767.96	3302481.06	245.54
955	785771.97	3302431.22	245.38
956	785784.17	3302383.06	245.18
957	785800.12	3302335.67	245.05
958	785816.94	3302288.66	244.80
959	785840.45	3302244.53	244.43
960	785863.97	3302200.41	244.38
961	785887.49	3302156.28	244.31
962	785913.09	3302113.53	244.17
963	785944.22	3302074.40	243.87
964	785975.35	3302035.27	243.59
965	786006.47	3301996.14	242.43
966	786047.85	3301969.29	243.44
967	786091.91	3301945.66	243.50
968	786135.97	3301922.02	243.52
969	786185.38	3301922.68	241.75
970	786234.37	3301928.21	243.54
971	786268.02	3301963.41	244.08
972	786278.68	3302011.57	244.26
973	786281.85	3302061.26	244.67
974	786276.28	3302110.95	244.50
975	786262.66	3302158.91	244.59
976	786242.77	3302204.78	244.60
977	786222.87	3302250.65	244.61
978	786213.30	3302299.22	244.59
979	786206.23	3302348.69	244.68
980	786203.54	3302398.17	244.74
981	786209.54	3302447.80	244.89
982	786220.16	3302496.65	245.11
983	786235.19	3302544.22	244.83
984	786262.66	3302586.00	244.69

985	786292.45	3302626.07	244.66
986	786327.26	3302661.49	244.55
987	786367.49	3302691.17	244.40
988	786412.42	3302712.59	244.24
989	786461.09	3302723.19	244.06
990	786510.90	3302720.58	243.82
991	786560.76	3302716.90	243.70
992	786610.62	3302713.21	243.64
993	786657.86	3302699.18	243.66
994	786706.20	3302687.60	243.65
995	786755.27	3302677.98	243.59
996	786804.33	3302668.36	243.60
997	786853.40	3302658.74	243.63
998	786897.30	3302635.68	243.72
999	786943.77	3302617.45	243.81
1000	786990.66	3302600.09	244.05
1001	787037.55	3302582.72	244.08
1002	787082.61	3302562.70	243.93
1003	787115.64	3302525.17	243.83
1004	787148.67	3302487.63	243.62
1005	787181.70	3302450.09	243.37
1006	787206.55	3302407.41	243.29
1007	787218.81	3302359.13	243.23
1008	787228.98	3302310.18	243.25
1009	787239.14	3302261.22	243.39
1010	787240.08	3302211.61	243.41
1011	787234.03	3302162.12	243.34
1012	787223.14	3302113.32	243.40
1013	787212.26	3302064.52	243.20
1014	787197.07	3302017.08	242.97
1015	787177.78	3301970.96	242.84
1016	787158.48	3301924.83	242.73
1017	787148.10	3301876.44	242.66
1018	787143.29	3301826.67	242.64
1019	787147.60	3301777.30	242.72
1020	787156.73	3301728.14	242.76
1021	787168.89	3301679.87	242.83
1022	787187.79	3301633.58	242.88
1023	787215.18	3301594.23	242.92
1024	787256.80	3301566.53	242.96
1025	787298.97	3301540.01	243.00
1026	787347.06	3301526.33	243.05
1027	787395.15	3301512.65	243.13
1028	787443.19	3301498.78	243.16
1029	787489.77	3301481.05	243.18
1030	787534.93	3301459.59	243.17
1031	787580.09	3301438.13	243.23

1032	787619.91	3301409.81	243.36
1033	787651.83	3301371.32	243.45
1034	787683.75	3301332.83	243.53
1035	787712.06	3301291.83	243.56
1036	787737.21	3301248.61	243.53
1037	787757.97	3301203.57	243.43
1038	787770.97	3301155.29	243.33
1039	787783.97	3301107.01	243.32
1040	787796.97	3301058.73	243.10
1041	787809.97	3301010.45	243.08
1042	787822.97	3300962.17	243.00
1043	787835.72	3300913.82	242.91
1044	787848.17	3300865.39	242.75
1045	787860.62	3300816.97	242.39
1046	787871.43	3300768.31	242.29
1047	787881.46	3300719.32	242.21
1048	787891.48	3300670.34	242.27
1049	787901.51	3300621.35	242.40
1050	787911.53	3300572.37	242.48
1051	787921.56	3300523.38	242.48
1052	787936.71	3300475.79	242.45
1053	787952.80	3300428.45	242.38
1054	787968.90	3300381.11	242.25
1055	787983.15	3300333.21	242.19
1056	787996.11	3300284.92	242.13
1057	788009.81	3300236.87	242.11
1058	788027.87	3300190.25	242.08
1059	788045.92	3300143.62	242.13
1060	788063.98	3300096.99	242.11
1061	788082.56	3300050.58	242.09
1062	788101.27	3300004.21	242.02
1063	788121.41	3299958.45	241.99
1064	788141.26	3299912.57	241.99
1065	788158.60	3299865.67	242.06
1066	788175.93	3299818.77	242.08
1067	788194.66	3299772.42	242.08
1068	788213.94	3299726.29	242.03
1069	788232.76	3299679.98	241.96
1070	788249.98	3299633.03	241.89
1071	788267.20	3299586.09	241.80
1072	788270.32	3299536.99	241.75
1073	788265.76	3299488.00	241.69
1074	788230.69	3299452.37	241.59
1075	788195.62	3299416.73	241.45
1076	788160.55	3299381.09	241.34
1077	788125.48	3299345.46	241.27
1078	788090.41	3299309.82	241.27

1079	788057.13	3299272.51	241.29
1080	788024.01	3299235.05	241.28
1081	787990.90	3299197.58	241.20
1082	787957.79	3299160.12	241.18
1083	787925.66	3299121.82	241.15
1084	787894.32	3299082.86	241.11
1085	787862.99	3299043.90	241.06
1086	787830.70	3299005.74	241.05
1087	787797.76	3298968.12	241.02
1088	787764.89	3298930.44	240.96
1089	787733.19	3298891.78	240.89
1090	787701.49	3298853.11	240.86
1091	787669.79	3298814.44	240.87
1092	787638.09	3298775.77	240.89
1093	787608.65	3298735.41	240.96
1094	787580.34	3298694.20	240.85
1095	787552.03	3298652.99	240.77
1096	787523.72	3298611.77	240.52
1097	787495.41	3298570.56	240.42
1098	787464.81	3298531.05	240.43
1099	787433.60	3298491.98	240.41
1100	787402.39	3298452.92	240.44
1101	787373.84	3298412.38	240.51
1102	787357.30	3298365.19	240.60
1103	787340.76	3298318.01	238.50
1104	787330.16	3298269.58	238.82
1105	787326.35	3298219.73	240.46
1106	787328.90	3298170.96	240.48
1107	787349.08	3298125.21	240.44
1108	787367.46	3298078.74	240.44
1109	787384.84	3298031.85	240.48
1110	787402.22	3297984.97	239.28
1111	787419.60	3297938.09	240.86
1112	787436.98	3297891.21	240.94
1113	787454.36	3297844.33	240.99
1114	787471.74	3297797.44	240.89
1115	787489.92	3297750.87	240.82
1116	787508.81	3297704.58	240.79
1117	787527.71	3297658.29	240.77
1118	787546.61	3297612.00	240.70
1119	787565.51	3297565.71	240.77
1120	787584.41	3297519.42	240.75
1121	787603.26	3297473.11	240.72
1122	787621.20	3297426.44	240.53
1123	787639.15	3297379.77	240.32
1124	787657.09	3297333.10	240.23
1125	787675.04	3297286.43	240.18

1126	787692.99	3297239.76	240.12
1127	787710.93	3297193.10	240.01
1128	787728.88	3297146.43	239.92
1129	787746.82	3297099.76	239.86
1130	787764.77	3297053.09	239.82
1131	787782.72	3297006.42	239.79
1132	787796.39	3296958.42	239.74
1133	787808.26	3296909.85	239.66
1134	787820.13	3296861.28	239.60
1135	787832.00	3296812.70	239.61
1136	787843.87	3296764.13	239.58
1137	787855.74	3296715.56	239.66
1138	787864.29	3296666.32	239.59
1139	787872.29	3296616.96	239.57
1140	787880.30	3296567.61	239.54
1141	787883.25	3296519.04	239.48
1142	787860.67	3296474.42	239.41
1143	787838.10	3296429.81	239.35
1144	787816.00	3296384.97	239.33
1145	787795.20	3296339.50	239.38
1146	787774.40	3296294.03	239.52
1147	787753.60	3296248.56	239.75
1148	787732.80	3296203.10	239.90
1149	787708.13	3296159.73	239.91
1150	787681.04	3296117.70	239.83
1151	787653.95	3296075.68	239.72
1152	787634.22	3296029.90	239.54
1153	787616.14	3295983.29	239.50
1154	787615.70	3295934.07	239.44
1155	787619.58	3295884.23	239.53
1156	787634.90	3295836.84	239.50
1157	787657.93	3295794.03	239.58
1158	787696.21	3295761.86	239.54
1159	787734.48	3295729.69	239.55
1160	787773.51	3295698.47	239.47
1161	787814.93	3295670.49	239.38
1162	787856.84	3295643.23	239.08
1163	787900.38	3295618.64	238.97
1164	787943.91	3295594.05	239.10
1165	787984.14	3295565.18	239.12
1166	788018.93	3295529.27	239.18
1167	788030.64	3295481.55	239.22
1168	788039.40	3295432.32	239.23
1169	788046.91	3295382.92	238.99
1170	788052.32	3295333.21	238.82
1171	788057.14	3295283.45	238.61
1172	788060.44	3295233.56	238.44

1173	788064.72	3295183.76	238.22
1174	788069.90	3295134.02	238.13
1175	788074.96	3295084.28	238.05
1176	788074.70	3295034.43	238.03
1177	788054.80	3294989.81	237.99
1178	788017.58	3294956.78	237.93
1179	787976.44	3294928.45	237.95
1180	787934.07	3294901.90	237.84
1181	787891.81	3294875.19	237.83
1182	787849.89	3294847.93	237.78
1183	787807.94	3294820.73	237.73
1184	787765.80	3294793.81	237.71
1185	787723.42	3294767.29	237.67
1186	787681.44	3294740.16	237.63
1187	787639.86	3294712.38	237.51
1188	787599.68	3294682.73	237.43
1189	787566.48	3294646.20	237.44
1190	787548.20	3294599.80	237.44
1191	787533.06	3294552.15	237.47
1192	787519.18	3294504.12	237.47
1193	787504.92	3294456.20	237.52
1194	787475.20	3294420.99	237.56
1195	787446.38	3294380.24	237.61
1196	787417.78	3294339.23	237.65
1197	787388.98	3294298.36	237.71
1198	787358.83	3294258.47	237.71
1199	787328.69	3294218.57	237.71
1200	787298.55	3294178.68	237.71
1201	787269.16	3294138.25	237.71
1202	787240.90	3294097.00	237.72
1203	787212.63	3294055.76	237.70
1204	787183.74	3294014.97	237.69
1205	787153.10	3293975.46	237.70

100 Year HFL Points			
S. No.	Right Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770596.97	3332771.82	302.24
2	770573.79	3332761.28	302.18
3	770528.51	3332740.15	302.16
4	770486.04	3332713.77	302.25
5	770472.95	3332670.56	302.25
6	770491.60	3332624.17	302.14
7	770512.34	3332578.67	302.00
8	770535.97	3332534.75	301.91
9	770562.89	3332492.61	301.87
10	770591.69	3332452.27	301.97
11	770632.51	3332423.39	302.24
12	770676.10	3332400.35	301.95
13	770724.91	3332397.10	302.39
14	770769.71	3332374.91	302.54
15	770811.52	3332348.14	302.57
16	770844.24	3332310.62	302.51
17	770874.37	3332270.72	302.58
18	770911.04	3332237.77	302.56
19	770952.71	3332210.14	302.57
20	770990.02	3332176.86	302.43
21	771030.14	3332147.28	302.16
22	771072.20	3332120.24	302.08
23	771111.67	3332089.60	301.83
24	771150.80	3332058.46	302.24
25	771188.69	3332026.11	301.40
26	771220.22	3331987.58	300.51
27	771262.27	3331960.53	300.34
28	771302.86	3331931.52	300.33
29	771340.93	3331899.10	300.80
30	771376.99	3331864.60	302.16
31	771411.07	3331828.02	302.74
32	771440.73	3331788.23	302.59
33	771464.83	3331744.43	302.68
34	771485.93	3331699.10	302.69
35	771506.88	3331653.70	302.81
36	771526.74	3331607.86	302.85
37	771543.49	3331560.75	302.81
38	771560.25	3331513.64	302.64
39	771574.72	3331466.02	302.71
40	771579.48	3331416.25	302.13
41	771584.25	3331366.48	301.52
42	771574.10	3331319.09	301.30
43	771553.82	3331273.44	301.96
44	771519.53	3331237.05	301.43

45	771475.74	3331214.77	300.05
46	771428.66	3331198.25	299.61
47	771384.34	3331175.15	299.45
48	771340.60	3331150.91	299.10
49	771296.87	3331126.68	298.95
50	771252.58	3331103.49	298.87
51	771208.15	3331080.54	299.20
52	771163.73	3331057.59	298.84
53	771118.27	3331036.99	298.32
54	771071.46	3331019.42	298.18
55	771024.64	3331001.86	298.01
56	770979.11	3330981.20	297.85
57	770933.59	3330960.51	297.69
58	770889.29	3330937.73	297.61
59	770848.84	3330908.34	297.54
60	770808.40	3330878.94	297.56
61	770767.95	3330849.55	297.83
62	770727.72	3330819.86	297.67
63	770687.70	3330789.88	297.59
64	770647.88	3330759.66	297.49
65	770609.22	3330727.95	297.08
66	770571.40	3330695.40	297.00
67	770539.38	3330656.99	296.82
68	770507.14	3330618.79	296.66
69	770472.94	3330582.31	296.72
70	770438.75	3330545.83	297.30
71	770406.85	3330507.40	297.96
72	770376.44	3330467.71	298.07
73	770345.26	3330428.65	297.96
74	770312.49	3330390.89	297.90
75	770280.21	3330352.77	298.43
76	770254.09	3330310.13	298.86
77	770229.15	3330267.06	298.76
78	770221.34	3330217.67	298.71
79	770213.52	3330168.29	297.91
80	770214.03	3330118.55	297.75
81	770217.59	3330068.67	297.55
82	770221.67	3330018.85	297.48
83	770226.96	3329969.13	297.43
84	770232.26	3329919.41	297.38
85	770245.87	3329871.56	297.34
86	770262.39	3329824.37	297.33
87	770278.49	3329777.03	297.17
88	770294.55	3329729.68	297.01
89	770311.96	3329682.85	297.12
90	770331.28	3329636.73	296.77
91	770344.79	3329588.70	296.84

92	770362.46	3329542.03	296.60
93	770382.35	3329496.16	296.48
94	770402.82	3329450.58	296.27
95	770417.21	3329402.69	295.94
96	770425.07	3329353.64	294.78
97	770395.46	3329314.38	294.26
98	770363.60	3329275.84	293.98
99	770331.74	3329237.31	293.84
100	770298.73	3329199.76	293.68
101	770265.22	3329162.65	293.50
102	770231.71	3329125.54	293.28
103	770199.06	3329087.71	293.10
104	770168.14	3329048.42	292.90
105	770137.22	3329009.12	292.68
106	770106.31	3328969.83	292.49
107	770075.39	3328930.53	292.32
108	770049.44	3328887.85	292.16
109	770024.09	3328844.75	292.02
110	769998.75	3328801.64	291.91
111	769973.40	3328758.54	291.82
112	769951.67	3328713.59	291.72
113	769932.29	3328667.51	291.63
114	769912.38	3328621.69	291.56
115	769889.36	3328577.31	291.51
116	769866.34	3328532.92	291.46
117	769843.32	3328488.54	291.40
118	769820.30	3328444.15	291.31
119	769803.28	3328397.35	291.20
120	769789.21	3328349.38	291.09
121	769775.13	3328301.40	290.98
122	769761.06	3328253.42	290.88
123	769742.25	3328207.22	290.80
124	769721.21	3328161.87	290.74
125	769700.16	3328116.51	290.71
126	769684.82	3328069.26	290.75
127	769674.60	3328020.32	290.69
128	769664.37	3327971.38	290.69
129	769654.15	3327922.43	290.63
130	769643.92	3327873.49	290.60
131	769632.65	3327824.79	290.60
132	769620.30	3327776.34	290.63
133	769607.95	3327727.89	290.50
134	769595.61	3327679.44	290.41
135	769580.92	3327631.83	290.31
136	769559.38	3327586.71	290.13
137	769536.69	3327542.17	289.98
138	769512.92	3327498.18	289.87

139	769489.15	3327454.20	289.78
140	769460.80	3327413.42	289.77
141	769427.53	3327376.10	289.89
142	769394.25	3327338.78	290.54
143	769360.98	3327301.46	291.00
144	769327.70	3327264.14	291.05
145	769294.43	3327226.82	291.23
146	769261.15	3327189.50	291.20
147	769227.88	3327152.18	291.25
148	769194.60	3327114.86	290.90
149	769162.05	3327076.91	290.69
150	769129.59	3327038.88	290.87
151	769097.13	3327000.84	291.19
152	769064.68	3326962.81	291.07
153	769032.22	3326924.78	290.82
154	768998.93	3326887.48	290.67
155	768965.14	3326850.62	290.48
156	768931.36	3326813.76	289.67
157	768896.61	3326777.87	288.95
158	768859.81	3326744.01	288.54
159	768823.02	3326710.16	288.28
160	768786.22	3326676.31	288.15
161	768746.27	3326646.31	288.16
162	768705.83	3326616.90	288.33
163	768665.39	3326587.49	288.62
164	768624.96	3326558.08	288.56
165	768584.52	3326528.68	288.62
166	768550.09	3326494.13	288.78
167	768527.31	3326449.62	288.66
168	768504.54	3326405.11	288.74
169	768481.77	3326360.60	288.87
170	768458.99	3326316.08	288.70
171	768442.06	3326269.57	288.67
172	768432.78	3326220.44	288.66
173	768423.50	3326171.31	288.78
174	768402.21	3326127.31	288.58
175	768373.15	3326086.62	288.45
176	768346.31	3326044.54	288.25
177	768322.52	3326000.57	288.27
178	768298.73	3325956.59	288.32
179	768270.70	3325915.52	288.30
180	768238.20	3325877.53	288.34
181	768206.43	3325839.08	288.57
182	768186.98	3325793.02	288.26
183	768167.53	3325746.96	287.85
184	768148.08	3325700.89	287.51
185	768128.63	3325654.83	287.43

186	768109.18	3325608.77	287.40
187	768110.66	3325559.37	287.48
188	768114.81	3325509.54	287.31
189	768118.96	3325459.71	287.37
190	768123.12	3325409.89	287.26
191	768127.27	3325360.06	287.17
192	768131.17	3325310.21	286.96
193	768135.00	3325260.36	286.91
194	768138.84	3325210.51	286.72
195	768142.67	3325160.65	286.59
196	768141.08	3325110.84	286.73
197	768136.55	3325061.04	286.29
198	768132.03	3325011.25	286.26
199	768127.50	3324961.45	286.04
200	768122.97	3324911.66	286.03
201	768117.10	3324862.01	285.94
202	768111.19	3324812.36	285.79
203	768105.28	3324762.71	285.69
204	768099.37	3324713.06	285.49
205	768098.46	3324663.32	285.36
206	768102.62	3324613.49	285.09
207	768106.78	3324563.67	284.76
208	768110.94	3324513.84	284.59
209	768115.10	3324464.01	284.68
210	768131.74	3324417.27	284.68
211	768151.27	3324371.24	284.67
212	768170.80	3324325.22	284.65
213	768190.33	3324279.19	284.44
214	768209.86	3324233.16	284.30
215	768225.97	3324186.13	284.28
216	768234.37	3324136.84	284.30
217	768242.77	3324087.55	284.62
218	768251.16	3324038.26	284.42
219	768259.56	3323988.97	285.54
220	768267.96	3323939.68	285.76
221	768270.03	3323889.91	285.79
222	768269.17	3323839.92	285.53
223	768268.31	3323789.93	285.01
224	768261.56	3323740.92	284.77
225	768246.08	3323693.38	284.56
226	768231.74	3323645.53	284.44
227	768221.48	3323596.59	284.40
228	768211.22	3323547.66	284.28
229	768200.96	3323498.72	283.71
230	768190.70	3323449.78	283.44
231	768180.44	3323400.85	283.22
232	768170.18	3323351.91	283.16

233	768164.38	3323302.44	283.09
234	768162.82	3323252.47	282.97
235	768161.26	3323202.49	282.84
236	768159.70	3323152.52	282.62
237	768156.56	3323102.62	282.39
238	768153.29	3323052.72	282.29
239	768150.02	3323002.83	282.21
240	768159.99	3322954.53	282.14
241	768174.99	3322906.83	282.00
242	768189.99	3322859.14	281.88
243	768204.99	3322811.44	281.73
244	768214.96	3322763.01	281.61
245	768214.10	3322713.02	281.52
246	768213.24	3322663.03	281.49
247	768211.90	3322613.10	281.26
248	768198.85	3322564.84	281.04
249	768185.81	3322516.57	281.02
250	768172.76	3322468.30	280.97
251	768161.89	3322419.51	280.86
252	768151.58	3322370.58	280.74
253	768141.26	3322321.66	280.67
254	768127.86	3322273.76	280.61
255	768106.91	3322228.36	280.57
256	768085.95	3322182.96	280.51
257	768065.00	3322137.57	280.44
258	768044.04	3322092.17	280.36
259	768023.09	3322046.77	280.30
260	767991.39	3322008.88	280.23
261	767955.98	3321973.58	280.21
262	767920.56	3321938.29	280.20
263	767890.55	3321899.70	280.19
264	767875.41	3321852.05	280.10
265	767860.28	3321804.39	280.09
266	767845.15	3321756.74	280.06
267	767825.68	3321710.80	280.21
268	767804.09	3321665.70	280.18
269	767781.46	3321621.13	280.25
270	767757.84	3321577.06	280.33
271	767734.23	3321532.99	280.33
272	767716.18	3321486.85	280.43
273	767705.42	3321438.03	280.35
274	767694.65	3321389.20	280.14
275	767683.89	3321340.37	279.97
276	767691.51	3321291.71	279.78
277	767703.16	3321243.09	279.70
278	767726.41	3321200.65	279.69
279	767760.30	3321163.88	279.89

280	767799.97	3321134.24	279.87
281	767842.91	3321108.63	279.84
282	767887.32	3321085.83	279.81
283	767932.92	3321065.32	279.79
284	767980.08	3321051.90	279.76
285	768030.08	3321051.31	279.73
286	768080.03	3321051.33	279.71
287	768129.30	3321059.82	279.68
288	768178.58	3321068.31	279.65
289	768226.54	3321082.36	279.63
290	768274.42	3321096.77	279.60
291	768322.41	3321110.79	281.80
292	768372.01	3321111.15	281.49
293	768421.95	3321108.61	280.98
294	768471.88	3321106.08	280.30
295	768521.82	3321103.54	279.68
296	768571.75	3321101.00	279.29
297	768621.69	3321098.47	279.23
298	768671.62	3321095.93	279.16
299	768721.56	3321093.39	278.99
300	768771.49	3321090.86	278.89
301	768821.43	3321088.32	278.67
302	768870.34	3321079.69	278.58
303	768918.38	3321065.80	278.45
304	768966.41	3321051.92	278.34
305	769014.44	3321038.03	278.24
306	769060.35	3321018.82	278.11
307	769104.76	3320995.85	278.01
308	769149.18	3320972.88	277.94
309	769193.59	3320949.91	277.88
310	769237.63	3320926.46	277.83
311	769281.14	3320902.10	277.78
312	769325.17	3320878.41	277.76
313	769369.20	3320854.72	277.63
314	769413.23	3320831.03	277.47
315	769457.26	3320807.33	277.29
316	769501.29	3320783.64	277.11
317	769545.32	3320759.95	277.11
318	769586.91	3320732.32	277.21
319	769627.64	3320703.33	277.33
320	769668.38	3320674.34	277.38
321	769705.50	3320642.16	277.35
322	769729.29	3320598.18	277.26
323	769753.08	3320554.20	277.10
324	769776.86	3320510.22	276.99
325	769787.21	3320462.22	276.89
326	769791.49	3320412.40	276.84

327	769795.77	3320362.58	276.70
328	769800.05	3320312.77	276.50
329	769804.33	3320262.95	276.26
330	769808.61	3320213.13	276.09
331	769813.31	3320163.36	275.97
332	769818.92	3320113.68	275.89
333	769823.83	3320063.94	275.91
334	769825.49	3320013.97	276.11
335	769827.15	3319963.99	276.28
336	769827.71	3319914.02	275.88
337	769826.29	3319864.04	275.82
338	769824.87	3319814.06	275.75
339	769820.15	3319764.33	275.69
340	769813.95	3319714.72	275.63
341	769807.75	3319665.10	275.57
342	769801.55	3319615.49	275.50
343	769799.73	3319565.66	275.44
344	769800.89	3319515.67	275.38
345	769802.05	3319465.68	275.32
346	769803.21	3319415.70	275.25
347	769804.37	3319365.71	275.19
348	769808.20	3319316.35	275.13
349	769829.55	3319271.14	275.07
350	769850.90	3319225.93	275.00
351	769872.25	3319180.72	274.94
352	769893.60	3319135.50	274.88
353	769916.42	3319091.52	274.81
354	769957.12	3319062.47	274.75
355	769997.82	3319033.42	274.69
356	770038.51	3319004.38	274.63
357	770084.82	3318987.65	275.87
358	770133.45	3318976.04	274.97
359	770159.81	3318934.24	274.96
360	770185.23	3318891.19	274.93
361	770210.65	3318848.13	274.97
362	770225.25	3318800.42	274.92
363	770230.36	3318751.05	274.69
364	770215.19	3318706.08	274.66
365	770189.43	3318663.59	276.26
366	770174.34	3318616.12	277.75
367	770170.59	3318567.26	278.47
368	770181.87	3318518.55	278.00
369	770195.45	3318470.81	277.05
370	770222.41	3318428.70	276.17
371	770251.27	3318388.14	275.33
372	770287.09	3318353.25	274.87
373	770322.90	3318318.37	274.35

374	770358.72	3318283.48	274.28
375	770394.84	3318248.97	274.25
376	770436.31	3318221.04	274.16
377	770477.79	3318193.11	274.03
378	770516.42	3318161.63	273.76
379	770552.77	3318127.29	273.54
380	770589.11	3318092.95	273.36
381	770625.45	3318058.62	273.24
382	770661.80	3318024.28	273.05
383	770694.26	3317986.49	272.91
384	770724.17	3317946.42	272.80
385	770754.07	3317906.34	272.76
386	770780.95	3317864.87	272.69
387	770792.08	3317816.13	272.65
388	770789.26	3317766.32	272.69
389	770783.70	3317716.63	272.75
390	770777.84	3317666.98	272.80
391	770770.15	3317617.67	272.82
392	770757.60	3317569.27	272.75
393	770757.08	3317519.94	272.62
394	770762.08	3317470.19	272.64
395	770767.53	3317420.50	272.74
396	770774.71	3317371.02	272.81
397	770781.90	3317321.54	272.74
398	770799.05	3317275.73	272.72
399	770825.72	3317233.44	272.64
400	770852.38	3317191.14	273.18
401	770881.88	3317150.85	272.23
402	770913.00	3317111.72	271.92
403	770944.13	3317072.59	271.80
404	770978.39	3317036.30	271.71
405	771014.26	3317001.47	271.60
406	771050.13	3316966.64	271.47
407	771082.60	3316929.88	271.30
408	771093.97	3316881.19	271.27
409	771105.34	3316832.50	271.19
410	771116.71	3316783.81	271.24
411	771137.89	3316738.57	271.17
412	771159.52	3316693.50	271.12
413	771184.27	3316650.80	271.11
414	771222.12	3316618.14	271.11
415	771259.98	3316585.47	271.09
416	771299.15	3316554.46	271.09
417	771339.42	3316524.82	271.05
418	771379.69	3316495.19	271.01
419	771423.90	3316473.23	270.98
420	771471.53	3316458.05	270.91

421	771519.84	3316449.54	270.86
422	771569.11	3316458.08	270.45
423	771616.81	3316471.18	270.14
424	771662.91	3316488.99	269.82
425	771712.61	3316487.43	269.67
426	771747.58	3316455.24	269.49
427	771775.06	3316413.50	269.27
428	771802.10	3316371.44	268.96
429	771826.96	3316328.28	268.62
430	771845.06	3316281.67	268.59
431	771864.24	3316235.51	268.69
432	771884.79	3316189.93	268.74
433	771918.17	3316153.17	268.82
434	771953.03	3316117.34	269.00
435	771986.62	3316080.31	269.36
436	772022.15	3316045.30	269.11
437	772060.54	3316013.27	268.89
438	772098.08	3315980.24	268.77
439	772136.17	3315947.87	268.73
440	772175.23	3315916.65	268.67
441	772214.53	3315885.74	268.60
442	772253.87	3315854.88	268.57
443	772293.20	3315824.01	268.64
444	772332.95	3315793.69	268.68
445	772372.89	3315763.61	268.68
446	772411.08	3315731.34	268.63
447	772449.68	3315699.60	268.57
448	772489.89	3315669.88	268.42
449	772529.10	3315638.85	268.32
450	772570.88	3315611.55	268.23
451	772613.71	3315585.75	268.14
452	772656.41	3315559.73	268.07
453	772698.75	3315533.14	268.01
454	772742.56	3315509.28	267.98
455	772788.13	3315488.72	268.02
456	772831.37	3315463.84	268.07
457	772873.47	3315436.87	268.11
458	772916.61	3315411.71	268.05
459	772961.09	3315388.87	267.87
460	772999.89	3315358.26	267.73
461	773030.81	3315319.26	267.63
462	773057.66	3315277.19	267.49
463	773077.33	3315231.29	267.47
464	773108.68	3315192.82	267.26
465	773119.46	3315147.65	267.09
466	773111.92	3315098.23	267.05
467	773103.90	3315048.88	267.01

468	773095.93	3314999.52	266.94
469	773087.97	3314950.15	266.88
470	773083.22	3314900.44	266.87
471	773080.49	3314850.52	266.70
472	773077.98	3314800.58	266.55
473	773073.95	3314750.75	266.60
474	773070.77	3314700.85	266.40
475	773067.59	3314650.95	266.39
476	773064.41	3314601.05	266.40
477	773071.15	3314551.56	266.28
478	773078.46	3314502.10	266.19
479	773085.78	3314452.64	266.13
480	773093.09	3314403.18	266.09
481	773100.41	3314353.72	266.04
482	773108.11	3314304.33	265.90
483	773120.24	3314255.82	265.67
484	773132.38	3314207.32	265.57
485	773144.51	3314158.81	265.48
486	773156.65	3314110.31	265.41
487	773169.34	3314061.96	265.30
488	773183.41	3314013.98	265.19
489	773197.48	3313966.00	265.07
490	773211.55	3313918.02	264.96
491	773229.77	3313871.66	264.85
492	773251.89	3313826.81	264.74
493	773276.53	3313783.59	264.63
494	773308.01	3313744.74	264.54
495	773344.08	3313710.65	264.44
496	773384.03	3313680.59	264.33
497	773430.95	3313663.73	264.23
498	773478.32	3313647.73	264.12
499	773528.20	3313644.32	264.02
500	773578.14	3313644.42	263.92
501	773628.11	3313646.22	263.81
502	773678.10	3313646.47	263.81
503	773728.01	3313647.80	263.60
504	773777.47	3313655.14	263.81
505	773826.92	3313662.49	263.81
506	773876.38	3313669.83	263.81
507	773925.12	3313680.05	263.60
508	773972.23	3313696.82	263.81
509	774020.88	3313708.16	263.81
510	774069.73	3313718.82	263.60
511	774118.80	3313728.36	264.51
512	774168.13	3313736.48	264.47
513	774217.75	3313739.42	264.51
514	774267.67	3313736.59	264.58

515	774317.60	3313735.18	264.57
516	774367.58	3313736.78	264.51
517	774417.51	3313737.56	264.45
518	774467.11	3313731.26	264.45
519	774516.72	3313724.97	264.39
520	774566.55	3313721.37	264.35
521	774616.50	3313719.10	264.34
522	774666.45	3313716.83	264.30
523	774715.54	3313724.77	264.25
524	774764.41	3313735.34	264.22
525	774813.33	3313745.56	264.20
526	774863.20	3313749.23	264.19
527	774913.06	3313752.91	264.13
528	774962.92	3313755.47	264.03
529	775012.90	3313756.68	263.93
530	775062.89	3313757.90	263.76
531	775112.88	3313759.12	263.60
532	775162.86	3313760.34	263.39
533	775212.68	3313764.42	263.36
534	775262.48	3313768.92	263.36
535	775312.28	3313773.42	263.37
536	775362.10	3313777.63	263.35
537	775411.97	3313781.11	263.34
538	775461.85	3313784.58	263.28
539	775511.00	3313792.01	263.12
540	775559.68	3313800.48	262.91
541	775609.67	3313799.53	262.71
542	775659.66	3313798.58	262.62
543	775709.63	3313799.43	262.56
544	775759.58	3313800.57	262.55
545	775809.32	3313795.56	262.55
546	775858.99	3313789.87	262.61
547	775907.36	3313779.76	262.64
548	775945.40	3313748.26	262.60
549	775972.36	3313706.87	262.56
550	775992.36	3313661.05	262.50
551	776003.80	3313613.04	262.47
552	776008.15	3313563.23	262.36
553	775970.97	3313530.28	262.20
554	775927.13	3313508.88	262.12
555	775896.06	3313469.70	262.12
556	775864.99	3313430.53	262.18
557	775834.41	3313391.03	262.34
558	775810.77	3313346.97	262.57
559	775787.13	3313302.91	262.61
560	775763.49	3313258.86	262.59
561	775743.94	3313214.14	262.51

562	775752.56	3313164.89	262.36
563	775761.17	3313115.64	262.26
564	775769.79	3313066.38	262.19
565	775782.80	3313018.20	262.09
566	775797.79	3312970.50	261.98
567	775812.78	3312922.80	261.89
568	775831.15	3312876.40	261.78
569	775851.94	3312830.93	261.70
570	775872.73	3312785.45	261.62
571	775899.37	3312744.52	261.79
572	775938.23	3312713.06	261.80
573	775977.30	3312681.91	261.33
574	776021.68	3312658.89	261.11
575	776066.07	3312635.87	260.99
576	776112.12	3312617.00	260.87
577	776160.11	3312602.95	260.79
578	776208.09	3312588.91	260.73
579	776256.08	3312574.86	260.68
580	776300.12	3312551.58	260.62
581	776343.43	3312526.59	260.56
582	776382.39	3312496.83	260.51
583	776411.37	3312456.08	260.47
584	776440.35	3312415.34	260.49
585	776469.32	3312374.59	260.53
586	776498.30	3312333.84	260.51
587	776521.64	3312289.63	260.49
588	776544.86	3312245.35	260.44
589	776572.03	3312203.94	260.37
590	776606.92	3312168.12	260.27
591	776638.77	3312130.14	260.18
592	776661.05	3312085.39	260.09
593	776681.94	3312039.97	259.98
594	776702.19	3311994.25	259.85
595	776722.43	3311948.53	259.72
596	776742.67	3311902.81	259.58
597	776762.91	3311857.09	259.46
598	776783.16	3311811.37	259.36
599	776795.60	3311763.15	259.49
600	776805.81	3311714.20	259.16
601	776818.01	3311665.85	259.31
602	776836.38	3311619.35	259.92
603	776855.19	3311573.11	259.47
604	776887.09	3311534.60	259.21
605	776919.18	3311496.27	259.45
606	776953.61	3311460.01	260.13
607	776988.03	3311423.75	261.30
608	777024.37	3311389.45	258.80

609	777061.51	3311355.97	258.82
610	777098.29	3311322.10	259.34
611	777134.97	3311288.12	259.04
612	777171.21	3311253.67	259.04
613	777207.52	3311219.30	259.48
614	777243.42	3311184.59	258.67
615	777276.83	3311147.45	258.72
616	777313.88	3311113.86	258.91
617	777347.48	3311076.89	259.04
618	777382.85	3311041.59	258.93
619	777418.95	3311007.02	258.60
620	777434.47	3310959.50	258.60
621	777447.88	3310911.33	258.55
622	777464.41	3310864.69	258.44
623	777491.94	3310822.96	258.31
624	777525.88	3310786.36	258.17
625	777558.31	3310748.36	258.12
626	777596.25	3310717.99	258.07
627	777643.27	3310702.24	257.98
628	777687.59	3310680.20	257.51
629	777732.67	3310658.57	257.52
630	777775.40	3310632.83	257.51
631	777816.97	3310605.05	257.56
632	777858.62	3310577.38	257.56
633	777899.96	3310549.26	257.54
634	777940.53	3310520.07	257.38
635	777980.15	3310489.56	257.43
636	778024.55	3310466.64	257.53
637	778069.35	3310444.46	257.93
638	778110.75	3310416.92	258.18
639	778148.75	3310384.46	257.70
640	778182.01	3310347.44	257.52
641	778215.64	3310310.98	257.60
642	778254.44	3310279.44	257.27
643	778296.47	3310252.63	257.29
644	778338.70	3310225.88	257.60
645	778380.85	3310198.99	257.91
646	778423.30	3310172.59	258.08
647	778468.19	3310150.83	257.92
648	778514.17	3310131.18	257.71
649	778559.66	3310110.47	257.38
650	778595.34	3310076.93	257.71
651	778623.99	3310035.95	257.84
652	778652.64	3309994.98	258.76
653	778681.29	3309954.00	259.59
654	778709.94	3309913.02	258.56
655	778738.59	3309872.05	258.53

656	778774.85	3309838.99	258.32
657	778816.94	3309811.98	257.99
658	778859.71	3309786.12	257.51
659	778902.86	3309760.84	257.31
660	778946.00	3309735.56	257.16
661	778989.14	3309710.29	257.06
662	779032.28	3309685.01	257.00
663	779071.92	3309655.04	256.99
664	779108.48	3309620.93	256.97
665	779145.03	3309586.82	257.11
666	779181.78	3309552.91	257.13
667	779218.64	3309519.13	257.09
668	779255.41	3309485.24	256.92
669	779291.82	3309450.98	256.47
670	779328.23	3309416.71	255.87
671	779367.62	3309385.96	255.78
672	779404.26	3309351.94	255.73
673	779440.15	3309317.13	255.65
674	779477.62	3309284.06	255.58
675	779514.34	3309250.15	255.51
676	779550.33	3309215.45	255.44
677	779588.42	3309183.18	255.37
678	779628.12	3309152.78	255.30
679	779670.60	3309126.82	255.78
680	779707.35	3309093.00	255.73
681	779746.70	3309062.23	255.65
682	779789.04	3309035.80	255.58
683	779833.53	3309012.97	255.51
684	779877.35	3308988.91	255.44
685	779920.74	3308964.08	254.94
686	779963.09	3308937.50	255.84
687	780004.92	3308910.12	255.66
688	780044.90	3308880.09	256.29
689	780079.69	3308844.41	256.14
690	780119.97	3308815.69	256.57
691	780163.37	3308792.20	256.30
692	780211.17	3308777.61	256.18
693	780258.98	3308763.08	254.99
694	780304.82	3308743.28	254.31
695	780348.45	3308719.64	254.15
696	780389.73	3308691.84	254.16
697	780436.13	3308673.23	254.14
698	780480.22	3308649.83	254.13
699	780525.06	3308627.74	254.32
700	780569.53	3308604.99	254.42
701	780612.32	3308579.13	254.65
702	780655.18	3308553.39	254.81

703	780699.39	3308530.03	255.02
704	780743.14	3308505.86	255.07
705	780786.29	3308480.59	255.20
706	780829.44	3308455.32	255.16
707	780872.65	3308430.17	255.13
708	780915.97	3308405.20	255.13
709	780959.30	3308380.26	255.10
710	781002.69	3308355.41	254.83
711	781045.59	3308329.77	254.65
712	781087.25	3308302.12	254.33
713	781128.92	3308274.48	254.17
714	781170.58	3308246.84	254.16
715	781213.09	3308220.65	254.09
716	781257.59	3308197.85	253.93
717	781302.03	3308174.93	253.93
718	781344.76	3308148.97	253.95
719	781387.36	3308122.81	253.98
720	781429.52	3308095.91	253.98
721	781472.42	3308070.24	253.96
722	781515.41	3308044.71	253.66
723	781558.74	3308019.75	253.56
724	781602.11	3307994.88	253.50
725	781646.27	3307971.51	253.53
726	781691.60	3307950.42	253.47
727	781735.46	3307926.41	253.31
728	781780.35	3307904.70	253.19
729	781820.70	3307875.39	253.23
730	781863.96	3307852.31	253.08
731	781910.97	3307835.40	252.92
732	781956.41	3307814.53	252.95
733	782002.06	3307794.16	253.16
734	782047.09	3307772.48	253.67
735	782093.00	3307752.67	253.98
736	782134.46	3307724.83	254.00
737	782175.61	3307696.43	254.12
738	782217.66	3307669.42	254.30
739	782260.62	3307643.84	254.56
740	782302.58	3307616.92	254.66
741	782339.18	3307582.86	254.68
742	782375.54	3307548.57	254.68
743	782408.39	3307510.87	254.69
744	782441.24	3307473.18	254.56
745	782470.38	3307432.93	254.16
746	782493.72	3307388.72	253.75
747	782516.31	3307344.13	253.78
748	782536.60	3307298.44	253.75
749	782556.76	3307252.69	253.67

750	782571.18	3307204.82	253.67
751	782582.89	3307156.59	253.44
752	782581.06	3307106.62	253.32
753	782578.51	3307056.78	253.36
754	782564.03	3307008.92	253.47
755	782549.54	3306961.07	253.50
756	782535.06	3306913.21	253.56
757	782528.28	3306863.68	253.51
758	782521.66	3306814.12	253.55
759	782517.84	3306764.52	253.61
760	782522.98	3306714.79	253.82
761	782528.13	3306665.05	253.90
762	782534.39	3306615.52	253.86
763	782546.89	3306567.11	253.70
764	782559.38	3306518.69	253.54
765	782571.88	3306470.28	253.15
766	782583.37	3306421.62	253.20
767	782594.55	3306372.89	253.16
768	782605.73	3306324.15	253.23
769	782616.91	3306275.42	253.12
770	782613.41	3306225.55	253.13
771	782609.88	3306175.67	253.20
772	782606.35	3306125.80	253.14
773	782602.81	3306075.92	253.05
774	782599.28	3306026.05	252.98
775	782595.75	3305976.17	253.01
776	782592.21	3305926.30	252.70
777	782602.63	3305877.46	252.53
778	782613.53	3305828.67	252.56
779	782624.43	3305779.87	252.56
780	782635.33	3305731.07	252.23
781	782646.23	3305682.27	252.08
782	782661.12	3305634.56	252.14
783	782676.29	3305586.91	252.48
784	782691.90	3305539.42	252.71
785	782708.39	3305492.21	252.80
786	782724.88	3305445.01	252.82
787	782741.95	3305398.02	252.92
788	782759.27	3305351.11	252.97
789	782776.59	3305304.21	253.10
790	782793.91	3305257.31	253.16
791	782825.46	3305219.69	253.03
792	782861.45	3305184.99	252.88
793	782897.34	3305150.18	252.76
794	782932.21	3305114.34	252.75
795	782967.07	3305078.50	252.80
796	783002.09	3305042.86	252.67

797	783045.67	3305018.36	252.72
798	783089.26	3304993.85	252.73
799	783132.32	3304968.72	252.68
800	783165.03	3304930.90	252.58
801	783197.74	3304893.08	252.43
802	783234.07	3304859.04	252.29
803	783273.21	3304827.93	252.03
804	783312.36	3304796.83	251.88
805	783353.91	3304769.39	251.90
806	783398.09	3304745.98	251.98
807	783442.27	3304722.57	252.04
808	783486.45	3304699.16	252.15
809	783534.53	3304689.10	251.93
810	783584.36	3304685.08	251.86
811	783634.13	3304684.31	251.23
812	783684.07	3304686.71	249.81
813	783733.99	3304684.78	249.51
814	783774.58	3304658.79	249.35
815	783812.50	3304626.20	249.28
816	783820.06	3304581.11	249.19
817	783816.05	3304531.27	249.62
818	783841.43	3304501.42	249.88
819	783889.26	3304486.84	249.71
820	783937.09	3304472.27	250.17
821	783984.20	3304455.75	250.15
822	784030.12	3304435.96	249.23
823	784076.04	3304416.18	249.91
824	784121.69	3304395.78	251.02
825	784167.15	3304374.96	251.23
826	784212.61	3304354.14	251.55
827	784258.07	3304333.33	252.62
828	784304.79	3304319.45	252.42
829	784354.68	3304322.90	252.08
830	784404.56	3304326.34	251.80
831	784454.18	3304331.83	251.67
832	784503.38	3304340.73	251.41
833	784552.59	3304349.62	251.10
834	784601.91	3304357.29	250.56
835	784651.90	3304358.15	250.34
836	784701.90	3304359.00	250.12
837	784751.89	3304359.86	249.84
838	784801.88	3304360.71	249.69
839	784851.87	3304361.57	249.89
840	784901.85	3304362.70	249.93
841	784951.66	3304367.03	249.92
842	785001.48	3304371.35	249.90
843	785051.29	3304375.68	249.80

844	785101.10	3304380.00	249.80
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846	785200.66	3304389.40	250.00
847	785250.39	3304394.51	250.00
848	785300.13	3304399.63	249.98
849	785349.75	3304405.76	249.97
850	785399.25	3304412.78	249.91
851	785448.79	3304419.13	249.82
852	785498.76	3304417.37	249.74
853	785548.53	3304414.55	249.60
854	785595.65	3304397.84	249.45
855	785640.05	3304377.82	249.31
856	785665.56	3304334.81	249.14
857	785687.32	3304290.71	249.07
858	785689.23	3304240.74	249.09
859	785693.93	3304191.18	249.07
860	785706.12	3304142.69	249.16
861	785721.13	3304095.32	249.21
862	785745.51	3304051.66	249.16
863	785769.88	3304008.00	249.06
864	785802.29	3303969.99	248.85
865	785832.30	3303930.56	248.61
866	785850.61	3303884.03	248.36
867	785864.60	3303836.06	248.24
868	785874.66	3303787.38	248.11
869	785876.10	3303737.40	248.13
870	785874.19	3303687.55	248.04
871	785868.91	3303637.83	248.05
872	785862.99	3303588.19	248.06
873	785856.21	3303538.65	248.03
874	785847.53	3303489.44	247.84
875	785837.40	3303440.47	247.65
876	785800.54	3303409.28	247.74
877	785761.41	3303378.37	247.86
878	785730.71	3303339.25	248.03
879	785702.71	3303297.83	248.02
880	785674.72	3303256.40	248.16
881	785646.72	3303214.97	248.09
882	785624.77	3303170.54	247.91
883	785608.62	3303123.22	247.72
884	785588.64	3303077.64	247.76
885	785563.54	3303034.40	248.01
886	785538.44	3302991.16	248.14
887	785513.33	3302947.92	248.19
888	785497.00	3302900.75	248.07
889	785481.45	3302853.23	247.92
890	785465.90	3302805.71	247.85

891	785454.36	3302757.09	247.79
892	785443.63	3302708.26	247.72
893	785432.90	3302659.42	247.80
894	785431.78	3302609.73	247.92
895	785433.66	3302559.76	248.06
896	785435.54	3302509.80	248.14
897	785437.82	3302459.86	248.13
898	785443.26	3302410.16	248.03
899	785448.69	3302360.46	247.84
900	785454.13	3302310.75	247.56
901	785463.51	3302261.71	247.40
902	785474.52	3302212.93	247.33
903	785485.53	3302164.16	247.24
904	785501.51	3302117.37	247.07
905	785527.00	3302074.35	247.27
906	785552.49	3302031.34	247.70
907	785577.85	3301988.25	247.87
908	785596.93	3301942.04	247.95
909	785616.02	3301895.83	247.85
910	785639.05	3301851.81	247.76
911	785668.29	3301811.25	247.17
912	785697.53	3301770.69	246.72
913	785718.64	3301726.02	246.46
914	785733.93	3301678.42	246.21
915	785749.23	3301630.82	246.21
916	785764.52	3301583.21	246.41
917	785779.81	3301535.61	246.81
918	785805.29	3301492.87	247.00
919	785832.72	3301451.07	247.02
920	785860.60	3301409.64	246.89
921	785896.81	3301375.16	246.77
922	785933.02	3301340.69	246.66
923	785969.23	3301306.21	246.62
924	786012.44	3301281.32	246.61
925	786056.42	3301257.60	246.59
926	786103.01	3301239.87	246.54
927	786149.04	3301220.35	246.52
928	786195.07	3301200.82	246.51
929	786241.10	3301181.29	246.49
930	786288.78	3301166.88	246.44
931	786337.56	3301155.94	246.38
932	786386.35	3301144.99	246.35
933	786435.13	3301134.04	246.34
934	786483.92	3301123.09	246.34
935	786533.25	3301115.44	246.34
936	786582.98	3301110.23	246.38
937	786632.70	3301105.01	246.29

938	786681.95	3301097.29	246.00
939	786730.05	3301083.66	245.88
940	786778.16	3301070.03	245.84
941	786826.27	3301056.40	245.80
942	786874.37	3301042.77	245.81
943	786910.21	3301015.92	245.84
944	786927.37	3300968.96	245.90
945	786943.23	3300921.94	246.00
946	786929.83	3300873.77	246.09
947	786916.44	3300825.60	246.09
948	786903.04	3300777.43	246.05
949	786900.36	3300727.91	245.98
950	786901.47	3300677.93	245.89
951	786902.57	3300627.94	245.73
952	786921.94	3300582.01	245.65
953	786942.13	3300536.27	245.67
954	786965.01	3300491.90	245.76
955	786990.29	3300448.76	245.91
956	787018.81	3300407.79	245.96
957	787048.94	3300367.88	245.96
958	787083.95	3300332.67	245.88
959	787122.57	3300300.92	245.70
960	787161.20	3300269.16	245.51
961	787206.54	3300250.33	245.35
962	787254.71	3300236.93	245.13
963	787301.64	3300221.08	244.83
964	787340.97	3300190.20	244.77
965	787380.29	3300159.32	244.68
966	787414.27	3300123.68	244.48
967	787440.33	3300081.02	242.82
968	787466.32	3300038.32	243.27
969	787470.10	3299988.46	243.79
970	787473.88	3299938.61	243.82
971	787476.41	3299888.73	242.41
972	787474.55	3299838.76	244.39
973	787472.69	3299788.80	244.62
974	787470.83	3299738.83	244.59
975	787458.03	3299690.64	245.03
976	787444.00	3299642.65	244.86
977	787429.98	3299594.65	244.85
978	787416.52	3299546.50	244.90
979	787403.29	3299498.28	244.95
980	787389.52	3299450.26	244.98
981	787369.09	3299404.62	245.10
982	787348.66	3299358.99	245.19
983	787328.23	3299313.35	245.34
984	787290.52	3299281.06	245.56

985	787251.54	3299249.75	245.20
986	787212.55	3299218.44	245.08
987	787173.57	3299187.14	245.07
988	787134.58	3299155.83	244.95
989	787095.60	3299124.52	244.81
990	787056.61	3299093.21	244.60
991	787017.63	3299061.91	244.39
992	786979.00	3299030.16	244.16
993	786940.75	3298997.96	244.06
994	786902.50	3298965.76	244.02
995	786864.24	3298933.57	244.02
996	786825.99	3298901.37	243.98
997	786787.74	3298869.17	243.98
998	786749.48	3298836.97	244.02
999	786711.23	3298804.78	244.20
1000	786672.94	3298772.62	244.28
1001	786634.60	3298740.52	244.49
1002	786596.26	3298708.43	244.62
1003	786557.92	3298676.34	244.57
1004	786519.58	3298644.24	244.44
1005	786481.24	3298612.15	244.28
1006	786442.16	3298580.98	244.03
1007	786402.61	3298550.38	243.85
1008	786363.07	3298519.78	243.72
1009	786323.52	3298489.19	243.67
1010	786283.98	3298458.59	243.75
1011	786244.43	3298427.99	243.81
1012	786204.94	3298397.33	243.72
1013	786166.23	3298365.68	243.60
1014	786127.52	3298334.03	243.71
1015	786088.81	3298302.39	243.61
1016	786050.10	3298270.74	243.23
1017	786011.39	3298239.09	243.11
1018	785972.68	3298207.44	243.03
1019	785940.95	3298169.42	242.98
1020	785912.91	3298128.02	243.00
1021	785884.88	3298086.62	243.08
1022	785856.85	3298045.22	243.10
1023	785828.81	3298003.81	243.10
1024	785800.78	3297962.41	243.08
1025	785772.75	3297921.01	243.03
1026	785764.49	3297872.10	243.09
1027	785758.00	3297822.53	243.15
1028	785751.50	3297772.95	243.24
1029	785745.00	3297723.37	243.31
1030	785738.51	3297673.80	243.38
1031	785732.01	3297624.22	243.41

1032	785743.32	3297576.10	243.44
1033	785757.79	3297528.24	243.46
1034	785772.25	3297480.38	243.47
1035	785786.72	3297432.52	243.55
1036	785801.18	3297384.65	243.67
1037	785817.04	3297337.40	243.81
1038	785842.45	3297294.34	243.90
1039	785867.87	3297251.29	243.92
1040	785893.29	3297208.23	243.86
1041	785918.71	3297165.17	243.80
1042	785944.12	3297122.11	243.77
1043	785951.37	3297073.02	243.74
1044	785956.77	3297023.31	243.69
1045	785962.17	3296973.60	243.61
1046	785967.57	3296923.90	243.44
1047	785972.97	3296874.19	243.30
1048	785978.37	3296824.48	243.32
1049	785985.45	3296774.98	243.06
1050	785992.58	3296725.50	243.04
1051	785999.71	3296676.01	243.04
1052	786006.85	3296626.52	243.02
1053	786022.65	3296579.08	243.00
1054	786038.45	3296531.64	242.93
1055	786054.25	3296484.21	242.84
1056	786070.05	3296436.77	242.70
1057	786085.85	3296389.33	242.53
1058	786101.65	3296341.89	242.43
1059	786127.04	3296299.49	242.42
1060	786157.12	3296259.55	242.42
1061	786187.20	3296219.61	242.37
1062	786217.29	3296179.68	242.34
1063	786256.61	3296150.63	242.29
1064	786300.93	3296127.49	242.28
1065	786345.25	3296104.36	242.30
1066	786389.58	3296081.22	242.26
1067	786433.98	3296058.24	242.24
1068	786478.59	3296035.64	242.27
1069	786523.19	3296013.05	242.34
1070	786566.65	3295989.25	242.40
1071	786591.68	3295945.96	242.37
1072	786616.70	3295902.67	242.31
1073	786641.72	3295859.38	242.23
1074	786666.74	3295816.10	242.19
1075	786691.76	3295772.81	242.20
1076	786716.78	3295729.52	242.16
1077	786741.80	3295686.23	242.11
1078	786768.90	3295644.29	241.98

1079	786798.40	3295603.92	241.75
1080	786827.90	3295563.55	241.63
1081	786857.39	3295523.18	241.59
1082	786886.89	3295482.81	241.58
1083	786906.76	3295436.96	241.55
1084	786926.36	3295390.96	241.42
1085	786945.97	3295344.96	241.34
1086	786965.57	3295298.97	241.30
1087	786978.82	3295250.89	241.32
1088	786985.42	3295202.49	241.33
1089	786968.36	3295155.49	241.32
1090	786950.33	3295109.34	241.26
1091	786906.16	3295085.90	241.21
1092	786862.00	3295062.46	241.21
1093	786816.10	3295043.75	241.23
1094	786767.23	3295033.16	241.28
1095	786718.37	3295022.58	241.21
1096	786669.36	3295027.07	241.10
1097	786620.31	3295036.77	240.88
1098	786571.26	3295046.47	240.77
1099	786522.13	3295055.55	240.81
1100	786472.26	3295059.14	240.81
1101	786422.39	3295062.74	240.85
1102	786372.52	3295066.34	240.95
1103	786322.64	3295066.80	241.02
1104	786272.75	3295063.52	239.60
1105	786222.85	3295060.24	238.21
1106	786173.32	3295053.57	240.80
1107	786123.83	3295046.41	240.81
1108	786076.43	3295031.95	240.80
1109	786030.64	3295011.88	240.78
1110	785988.39	3294985.39	240.80
1111	785950.36	3294954.55	240.74
1112	785930.29	3294908.75	239.06
1113	785922.67	3294860.60	241.33
1114	785924.63	3294810.64	241.41
1115	785926.60	3294760.68	241.33
1116	785928.56	3294710.72	241.23
1117	785930.53	3294660.76	241.19
1118	785930.73	3294610.81	241.18
1119	785927.66	3294560.91	241.17
1120	785904.59	3294516.72	241.16
1121	785880.49	3294472.92	241.08
1122	785855.95	3294429.36	241.04
1123	785824.87	3294391.33	240.80
1124	785784.10	3294363.40	240.66
1125	785736.34	3294348.61	240.56

1126	785686.71	3294349.95	240.45
1127	785636.84	3294353.47	240.26
1128	785587.60	3294345.77	240.17
1129	785541.92	3294330.13	240.09
1130	785507.09	3294294.26	240.10
1131	785477.00	3294254.89	240.12
1132	785453.05	3294211.01	240.14
1133	785429.09	3294167.12	240.14
1134	785404.17	3294123.79	240.06
1135	785377.94	3294081.22	240.02
1136	785351.71	3294038.65	240.06
1137	785325.49	3293996.08	239.99
1138	785302.77	3293951.56	240.07
1139	785280.27	3293906.90	239.92
1140	785257.77	3293862.25	239.90
1141	785241.56	3293815.42	239.95
1142	785231.54	3293766.43	239.91
1143	785213.80	3293720.44	239.77
1144	785188.17	3293677.51	239.74
1145	785162.55	3293634.57	239.72
1146	785147.24	3293587.06	239.73
1147	785132.89	3293539.17	239.87
1148	785119.89	3293490.89	240.08
1149	785106.88	3293442.61	240.28
1150	785094.56	3293394.21	240.38
1151	785090.05	3293344.42	240.34
1152	785086.03	3293294.58	240.24
1153	785082.70	3293244.69	240.12
1154	785070.25	3293196.37	239.97
1155	785056.74	3293148.23	239.92
1156	785048.86	3293098.95	239.91
1157	785042.61	3293049.34	239.95
1158	785032.22	3293000.51	239.96
1159	785020.09	3292952.00	239.95
1160	785007.96	3292903.50	239.95
1161	784995.84	3292854.99	239.90
1162	784983.71	3292806.48	239.85
1163	784971.58	3292757.98	239.70
1164	784957.75	3292710.01	239.46
1165	784939.69	3292663.39	239.44
1166	784921.62	3292616.76	239.60
1167	784903.56	3292570.14	239.65
1168	784885.49	3292523.52	239.65
1169	784867.76	3292476.79	239.66
1170	784856.66	3292428.04	239.61
1171	784845.56	3292379.29	239.42
1172	784829.72	3292331.99	239.20

1173	784811.54	3292285.42	239.02
1174	784793.35	3292238.84	238.86
1175	784775.16	3292192.27	238.66
1176	784768.17	3292142.81	238.54
1177	784756.14	3292094.49	238.51
1178	784740.63	3292046.95	238.50
1179	784725.12	3291999.42	238.42
1180	784709.60	3291951.89	238.39
1181	784694.09	3291904.35	238.36
1182	784678.58	3291856.82	238.33
1183	784663.07	3291809.29	238.30
1184	784647.56	3291761.75	238.22
1185	784622.08	3291719.90	238.19
1186	784589.10	3291682.32	238.16
1187	784556.11	3291644.74	238.09
1188	784523.13	3291607.16	237.98
1189	784485.17	3291574.72	237.88
1190	784446.59	3291542.92	237.87
1191	784408.01	3291511.11	237.88
1192	784370.78	3291478.24	237.92
1193	784348.58	3291433.44	237.93
1194	784326.38	3291388.63	237.96
1195	784304.19	3291343.83	238.00
1196	784281.99	3291299.03	238.04
1197	784259.61	3291254.32	238.08
1198	784237.09	3291209.67	238.11
1199	784220.55	3291162.58	238.12
1200	784205.40	3291114.94	238.13
1201	784193.84	3291066.29	238.14
1202	784182.81	3291017.54	238.15
1203	784173.82	3290968.35	238.14
1204	784166.07	3290918.97	238.13
1205	784159.51	3290869.40	238.11

100 Year HFL Points			
S. No.	Left Bank		
	Easting (X)	Northing (Y)	Elevation (m)
1	770597.0	3332771.8	302.24
2	770640.0	3332797.3	302.18
3	770683.8	3332821.2	302.16
4	770720.2	3332811.3	302.25
5	770747.8	3332769.6	302.25
6	770775.5	3332728.0	302.14
7	770803.2	3332686.3	302.00
8	770830.8	3332644.7	301.91
9	770858.3	3332602.9	301.87
10	770886.3	3332561.5	301.97
11	770920.6	3332525.1	302.24
12	770957.4	3332491.5	301.95
13	770997.2	3332461.3	302.39
14	771036.9	3332430.9	302.54
15	771076.4	3332400.3	302.57
16	771116.1	3332369.8	302.51
17	771155.8	3332339.5	302.58
18	771192.4	3332305.5	302.56
19	771228.6	3332270.9	302.57
20	771270.7	3332244.1	302.43
21	771313.2	3332217.7	302.16
22	771356.5	3332192.7	302.08
23	771394.8	3332161.5	301.83
24	771433.1	3332129.7	302.24
25	771473.8	3332100.7	301.40
26	771514.5	3332071.6	300.51
27	771550.4	3332038.1	300.34
28	771576.5	3331995.5	300.33
29	771606.2	3331955.3	300.80
30	771632.9	3331913.2	302.16
31	771657.5	3331869.6	302.74
32	771682.1	3331826.1	302.59
33	771706.7	3331782.6	302.68
34	771729.6	3331738.1	302.69
35	771752.4	3331693.6	302.81
36	771774.5	3331648.8	302.85
37	771793.9	3331602.7	302.81
38	771808.5	3331555.0	302.64
39	771819.1	3331506.2	302.71
40	771823.5	3331456.4	302.13
41	771814.6	3331407.3	301.52
42	771805.2	3331358.2	301.30
43	771789.3	3331310.9	301.96
44	771772.1	3331264.0	301.43

45	771754.8	3331217.0	300.05
46	771726.4	3331176.2	299.61
47	771696.5	3331136.1	299.45
48	771666.7	3331096.0	299.10
49	771628.0	3331064.9	298.95
50	771587.0	3331036.4	298.87
51	771546.3	3331007.3	299.20
52	771506.1	3330977.6	298.84
53	771462.2	3330953.6	298.32
54	771418.2	3330929.9	298.18
55	771374.0	3330906.6	298.01
56	771327.4	3330888.6	297.85
57	771280.8	3330870.4	297.69
58	771234.6	3330851.3	297.61
59	771188.8	3330831.2	297.54
60	771144.3	3330808.6	297.56
61	771099.7	3330785.9	297.83
62	771055.1	3330763.3	297.67
63	771011.3	3330740.0	297.59
64	770966.1	3330719.5	297.49
65	770919.3	3330701.9	297.08
66	770872.4	3330684.4	297.00
67	770830.7	3330657.5	296.82
68	770790.7	3330627.6	296.66
69	770749.8	3330598.8	296.72
70	770706.3	3330574.2	297.30
71	770669.3	3330541.1	297.96
72	770634.4	3330505.4	298.07
73	770600.6	3330468.5	297.96
74	770568.7	3330430.1	297.90
75	770536.7	3330391.6	298.43
76	770504.8	3330353.1	298.86
77	770471.9	3330315.6	298.76
78	770434.6	3330283.5	298.71
79	770431.2	3330234.3	297.91
80	770429.2	3330184.3	297.75
81	770427.7	3330134.4	297.55
82	770439.0	3330085.7	297.48
83	770450.2	3330037.0	297.43
84	770467.0	3329990.2	297.38
85	770501.6	3329956.4	297.34
86	770550.5	3329950.6	297.33
87	770599.1	3329962.5	297.17
88	770643.1	3329985.4	297.01
89	770685.7	3330011.4	297.12
90	770735.4	3330013.9	296.77
91	770785.4	3330015.4	296.84

92	770835.4	3330016.8	296.60
93	770885.3	3330018.2	296.48
94	770935.1	3330015.8	296.27
95	770984.7	3330009.6	295.94
96	771034.4	3330003.4	294.78
97	771084.0	3329997.2	294.26
98	771119.2	3329962.8	293.98
99	771153.2	3329926.2	293.84
100	771187.3	3329889.6	293.68
101	771217.8	3329850.9	293.50
102	771233.8	3329803.5	293.28
103	771249.9	3329756.2	293.10
104	771265.9	3329708.8	292.90
105	771281.9	3329661.4	292.68
106	771281.4	3329613.0	292.49
107	771271.6	3329564.0	292.32
108	771261.8	3329514.9	292.16
109	771251.3	3329466.1	292.02
110	771231.7	3329420.1	291.91
111	771212.2	3329374.1	291.82
112	771192.3	3329328.2	291.72
113	771171.6	3329282.7	291.63
114	771150.9	3329237.2	291.56
115	771130.2	3329191.7	291.51
116	771109.5	3329146.2	291.46
117	771090.7	3329099.9	291.40
118	771072.7	3329053.2	291.31
119	771054.7	3329006.6	291.20
120	771036.7	3328959.9	291.09
121	771018.8	3328913.3	290.98
122	770999.2	3328867.2	290.88
123	770979.7	3328821.2	290.80
124	770960.1	3328775.2	290.74
125	770940.5	3328729.2	290.71
126	770917.2	3328685.0	290.75
127	770893.5	3328640.9	290.69
128	770868.9	3328597.4	290.69
129	770844.3	3328553.9	290.63
130	770815.0	3328513.4	290.60
131	770785.5	3328473.0	290.60
132	770749.7	3328438.7	290.63
133	770709.7	3328408.8	290.50
134	770666.6	3328383.6	290.41
135	770621.7	3328361.9	290.31
136	770575.1	3328343.6	290.13
137	770534.9	3328316.7	289.98
138	770503.2	3328278.0	289.87

139	770471.6	3328239.3	289.78
140	770441.2	3328199.6	289.77
141	770411.8	3328159.2	289.89
142	770382.4	3328118.8	290.54
143	770352.9	3328078.3	291.00
144	770323.5	3328037.9	291.05
145	770292.9	3327998.5	291.23
146	770258.0	3327962.7	291.20
147	770223.1	3327926.9	291.25
148	770188.1	3327891.2	290.90
149	770151.6	3327857.0	290.69
150	770121.4	3327817.8	290.87
151	770096.8	3327774.3	291.19
152	770080.1	3327727.2	291.07
153	770079.8	3327678.1	290.82
154	770074.3	3327629.2	290.67
155	770058.0	3327582.2	290.48
156	770034.1	3327538.3	289.67
157	770010.1	3327494.4	288.95
158	769985.8	3327450.7	288.54
159	769961.1	3327407.3	288.28
160	769936.4	3327363.8	288.15
161	769911.6	3327320.4	288.16
162	769886.9	3327276.9	288.33
163	769856.9	3327237.0	288.62
164	769826.2	3327197.5	288.56
165	769795.4	3327158.1	288.62
166	769764.6	3327118.7	288.78
167	769733.9	3327079.3	288.66
168	769704.8	3327038.7	288.74
169	769676.8	3326997.2	288.87
170	769648.8	3326955.8	288.70
171	769620.9	3326914.3	288.67
172	769592.9	3326872.9	288.66
173	769566.4	3326830.6	288.78
174	769542.8	3326786.5	288.58
175	769519.2	3326742.4	288.45
176	769495.6	3326698.3	288.25
177	769472.0	3326654.2	288.27
178	769443.6	3326613.9	288.32
179	769406.6	3326580.2	288.30
180	769369.6	3326546.6	288.34
181	769365.6	3326498.6	288.57
182	769366.3	3326448.6	288.26
183	769366.9	3326398.6	287.85
184	769367.6	3326348.6	287.51
185	769368.4	3326298.6	287.43

186	769371.7	3326248.8	287.40
187	769375.0	3326198.9	287.48
188	769378.3	3326149.0	287.31
189	769394.4	3326103.3	287.37
190	769421.4	3326061.2	287.26
191	769423.9	3326015.5	287.17
192	769410.5	3325967.3	286.96
193	769397.0	3325919.2	286.91
194	769383.6	3325871.0	286.72
195	769370.1	3325822.9	286.59
196	769357.9	3325774.4	286.73
197	769346.0	3325725.8	286.29
198	769334.2	3325677.2	286.26
199	769322.4	3325628.6	286.04
200	769311.7	3325579.8	286.03
201	769301.3	3325530.9	285.94
202	769295.1	3325481.5	285.79
203	769293.4	3325431.5	285.69
204	769292.5	3325381.6	285.49
205	769296.1	3325331.7	285.36
206	769298.2	3325281.7	285.09
207	769285.2	3325235.5	284.76
208	769259.0	3325193.0	284.59
209	769233.1	3325150.2	284.68
210	769207.9	3325107.1	284.68
211	769182.8	3325063.8	284.67
212	769158.6	3325020.0	284.65
213	769134.5	3324976.3	284.44
214	769110.5	3324932.4	284.30
215	769086.9	3324888.3	284.28
216	769063.3	3324844.2	284.30
217	769036.2	3324802.2	284.62
218	769008.5	3324760.6	284.42
219	768980.7	3324719.0	285.54
220	768944.1	3324685.0	285.76
221	768907.4	3324651.0	285.79
222	768870.7	3324617.1	285.53
223	768834.0	3324583.1	285.01
224	768797.3	3324549.2	284.77
225	768760.6	3324515.2	284.56
226	768726.2	3324479.0	284.44
227	768692.9	3324441.7	284.40
228	768659.7	3324404.4	284.28
229	768626.4	3324367.0	283.71
230	768613.9	3324319.6	283.44
231	768609.3	3324270.1	283.22
232	768611.0	3324220.1	283.16

233	768611.8	3324170.1	283.09
234	768622.8	3324122.2	282.97
235	768636.6	3324074.7	282.84
236	768639.7	3324024.8	282.62
237	768635.6	3323975.7	282.39
238	768621.6	3323927.7	282.29
239	768615.0	3323878.4	282.21
240	768611.9	3323828.5	282.14
241	768622.0	3323779.8	282.00
242	768632.6	3323731.2	281.88
243	768631.8	3323681.2	281.73
244	768631.1	3323631.2	281.61
245	768630.3	3323581.2	281.52
246	768629.5	3323531.2	281.49
247	768630.3	3323481.3	281.26
248	768638.0	3323431.9	281.04
249	768645.6	3323382.5	281.02
250	768641.3	3323333.8	280.97
251	768627.5	3323285.8	280.86
252	768613.6	3323237.7	280.74
253	768606.6	3323188.4	280.67
254	768602.2	3323138.6	280.61
255	768597.8	3323088.8	280.57
256	768593.4	3323039.0	280.51
257	768589.0	3322989.2	280.44
258	768584.6	3322939.4	280.36
259	768580.2	3322889.6	280.30
260	768575.7	3322839.8	280.23
261	768562.2	3322791.7	280.21
262	768548.4	3322743.6	280.20
263	768534.5	3322695.6	280.19
264	768520.7	3322647.5	280.10
265	768506.8	3322599.5	280.09
266	768492.8	3322551.5	280.06
267	768478.5	3322503.6	280.21
268	768464.3	3322455.6	280.18
269	768450.0	3322407.7	280.25
270	768435.8	3322359.8	280.33
271	768421.5	3322311.9	280.33
272	768408.3	3322263.7	280.43
273	768395.2	3322215.4	280.35
274	768382.1	3322167.1	280.14
275	768369.0	3322118.9	279.97
276	768355.9	3322070.6	279.78
277	768342.8	3322022.4	279.70
278	768337.6	3321972.7	279.69
279	768332.9	3321922.9	279.89

280	768328.2	3321873.1	279.87
281	768323.4	3321823.4	279.84
282	768318.7	3321773.6	279.81
283	768315.3	3321723.7	279.79
284	768313.2	3321673.8	279.76
285	768311.1	3321623.8	279.73
286	768309.0	3321573.9	279.71
287	768306.9	3321523.9	279.68
288	768321.0	3321476.2	279.65
289	768340.2	3321431.9	279.63
290	768386.0	3321411.9	279.60
291	768431.8	3321391.8	281.80
292	768479.3	3321377.9	281.49
293	768528.9	3321371.9	280.98
294	768578.6	3321365.9	280.30
295	768628.3	3321360.9	279.68
296	768655.5	3321357.1	279.29
297	768705.2	3321362.3	279.23
298	768755.0	3321367.5	279.16
299	768804.7	3321372.7	278.99
300	768854.4	3321377.9	278.89
301	768904.1	3321383.1	278.67
302	768953.9	3321388.3	278.58
303	769003.8	3321390.3	278.45
304	769053.8	3321390.5	278.34
305	769103.8	3321390.6	278.24
306	769153.8	3321390.8	278.11
307	769203.8	3321391.0	278.01
308	769253.8	3321391.1	277.94
309	769303.2	3321384.9	277.88
310	769352.5	3321376.3	277.83
311	769401.8	3321367.8	277.78
312	769451.0	3321359.2	277.76
313	769500.3	3321350.7	277.63
314	769549.5	3321342.1	277.47
315	769598.8	3321333.6	277.29
316	769648.4	3321327.9	277.11
317	769698.3	3321325.6	277.11
318	769748.3	3321323.4	277.21
319	769798.2	3321321.1	277.33
320	769848.2	3321318.9	277.38
321	769898.1	3321318.8	277.35
322	769948.0	3321321.9	277.26
323	769997.9	3321325.0	277.10
324	770046.0	3321338.4	276.99
325	770094.0	3321352.4	276.89
326	770142.7	3321360.9	276.84

327	770192.6	3321358.3	276.70
328	770242.5	3321355.8	276.50
329	770292.5	3321353.2	276.26
330	770340.6	3321345.5	276.09
331	770381.7	3321317.0	275.97
332	770422.8	3321288.5	275.89
333	770453.2	3321249.7	275.91
334	770480.2	3321207.6	276.11
335	770491.3	3321159.6	276.28
336	770496.0	3321110.0	275.88
337	770494.4	3321060.0	275.82
338	770492.7	3321010.0	275.75
339	770491.0	3320960.1	275.69
340	770489.4	3320910.1	275.63
341	770487.7	3320860.1	275.57
342	770486.0	3320810.2	275.50
343	770476.7	3320761.1	275.44
344	770466.7	3320712.1	275.38
345	770456.8	3320663.1	275.32
346	770446.8	3320614.1	275.25
347	770436.8	3320565.1	275.19
348	770425.2	3320516.8	275.13
349	770396.1	3320476.1	275.07
350	770367.1	3320435.5	275.00
351	770338.0	3320394.8	274.94
352	770310.6	3320353.0	274.88
353	770284.5	3320310.3	274.81
354	770258.3	3320267.7	274.75
355	770232.5	3320225.0	274.69
356	770218.5	3320177.0	274.63
357	770204.6	3320128.9	275.87
358	770190.7	3320080.9	274.97
359	770176.7	3320032.9	274.96
360	770165.9	3319984.2	274.93
361	770157.9	3319934.8	274.97
362	770149.9	3319885.5	274.92
363	770141.9	3319836.1	274.69
364	770140.6	3319786.1	274.66
365	770139.3	3319736.2	276.26
366	770138.0	3319686.2	277.75
367	770136.7	3319636.2	278.47
368	770136.9	3319586.3	278.00
369	770144.0	3319536.8	277.05
370	770151.0	3319487.3	276.17
371	770158.1	3319437.8	275.33
372	770165.2	3319388.3	274.87
373	770184.2	3319342.8	274.35

374	770208.4	3319299.1	274.28
375	770238.2	3319260.6	274.25
376	770280.6	3319234.1	274.16
377	770323.0	3319207.6	274.03
378	770371.2	3319199.0	273.76
379	770421.1	3319195.5	273.54
380	770470.7	3319194.2	273.36
381	770518.6	3319208.5	273.24
382	770566.6	3319222.7	273.05
383	770614.5	3319237.0	272.91
384	770662.4	3319251.2	272.80
385	770708.7	3319248.1	272.76
386	770753.1	3319225.2	272.69
387	770797.5	3319202.2	272.65
388	770841.9	3319179.2	272.69
389	770881.9	3319151.0	272.75
390	770912.5	3319111.4	272.80
391	770943.1	3319071.8	272.82
392	770973.6	3319032.3	272.75
393	770989.4	3318985.6	272.62
394	771001.2	3318937.0	272.64
395	771013.0	3318888.4	272.74
396	771024.8	3318839.8	272.81
397	771024.4	3318791.5	272.74
398	771010.5	3318743.4	272.72
399	770996.6	3318695.4	272.64
400	770979.8	3318649.1	273.18
401	770945.6	3318612.6	272.23
402	770911.4	3318576.2	271.92
403	770874.0	3318543.0	271.80
404	770836.8	3318509.8	271.71
405	770816.6	3318464.1	271.60
406	770825.5	3318416.8	271.47
407	770840.6	3318369.1	271.30
408	770861.2	3318323.6	271.27
409	770882.3	3318278.3	271.19
410	770903.8	3318233.1	271.24
411	770925.9	3318188.3	271.17
412	770947.9	3318143.4	271.12
413	770970.0	3318098.5	271.11
414	770992.1	3318053.7	271.11
415	771012.0	3318007.8	271.09
416	771031.3	3317961.7	271.09
417	771050.6	3317915.6	271.05
418	771063.2	3317867.5	271.01
419	771071.7	3317818.2	270.98
420	771080.2	3317768.9	270.91

421	771081.1	3317719.5	270.86
422	771074.7	3317669.9	270.45
423	771068.2	3317620.4	270.14
424	771061.7	3317570.8	269.82
425	771067.5	3317521.4	269.67
426	771075.8	3317472.1	269.49
427	771085.6	3317423.2	269.27
428	771099.9	3317375.3	268.96
429	771114.3	3317327.4	268.62
430	771145.3	3317288.9	268.59
431	771178.8	3317251.7	268.69
432	771212.3	3317214.6	268.74
433	771245.5	3317177.3	268.82
434	771275.0	3317136.9	269.00
435	771304.4	3317096.5	269.36
436	771333.9	3317056.1	269.11
437	771357.4	3317012.0	268.89
438	771380.5	3316967.6	268.77
439	771403.6	3316923.3	268.73
440	771440.8	3316890.8	268.67
441	771480.6	3316860.6	268.60
442	771523.8	3316836.1	268.57
443	771569.6	3316816.1	268.64
444	771615.5	3316796.1	268.68
445	771664.9	3316799.3	268.68
446	771714.7	3316804.3	268.63
447	771764.4	3316809.2	268.57
448	771812.8	3316799.9	268.42
449	771860.7	3316785.4	268.32
450	771903.7	3316763.1	268.23
451	771937.9	3316726.7	268.14
452	771975.3	3316694.9	268.07
453	772021.8	3316676.5	268.01
454	772066.9	3316677.4	267.98
455	772095.6	3316636.4	268.02
456	772124.3	3316595.4	268.07
457	772152.9	3316554.5	268.11
458	772181.6	3316513.5	268.05
459	772212.5	3316474.4	267.87
460	772236.5	3316430.6	267.73
461	772266.5	3316390.9	267.63
462	772295.4	3316350.1	267.49
463	772325.3	3316310.0	267.47
464	772357.0	3316271.4	267.26
465	772389.8	3316233.7	267.09
466	772425.8	3316199.0	267.05
467	772465.2	3316168.3	267.01

468	772506.1	3316139.5	266.94
469	772547.0	3316110.7	266.88
470	772588.4	3316082.7	266.87
471	772629.9	3316054.7	266.70
472	772669.8	3316024.7	266.55
473	772709.6	3315994.4	266.60
474	772751.8	3315967.7	266.40
475	772792.8	3315939.0	266.39
476	772835.5	3315913.1	266.40
477	772878.7	3315888.0	266.28
478	772921.7	3315862.5	266.19
479	772967.3	3315841.9	266.13
480	773013.8	3315823.6	266.09
481	773061.1	3315807.9	266.04
482	773109.3	3315796.1	265.90
483	773141.4	3315758.7	265.67
484	773157.9	3315712.3	265.57
485	773176.7	3315666.0	265.48
486	773199.9	3315621.7	265.41
487	773219.9	3315575.9	265.30
488	773240.5	3315530.3	265.19
489	773251.2	3315481.5	265.07
490	773256.4	3315431.9	264.96
491	773259.6	3315382.0	264.85
492	773257.0	3315332.2	264.74
493	773254.7	3315282.5	264.63
494	773260.0	3315232.8	264.54
495	773272.3	3315184.6	264.44
496	773294.8	3315140.0	264.33
497	773316.3	3315095.0	264.23
498	773334.8	3315048.6	264.12
499	773350.7	3315001.2	264.02
500	773365.6	3314953.5	263.92
501	773382.7	3314906.5	263.81
502	773398.6	3314859.2	263.81
503	773416.4	3314812.4	263.60
504	773448.2	3314774.3	263.81
505	773484.8	3314740.3	263.81
506	773520.1	3314704.8	263.81
507	773551.2	3314667.1	263.60
508	773563.1	3314618.5	263.81
509	773575.1	3314570.0	263.81
510	773591.2	3314522.8	263.60
511	773609.9	3314476.4	264.51
512	773615.6	3314428.1	264.47
513	773610.8	3314378.4	264.51
514	773605.9	3314328.6	264.58

515	773601.0	3314278.8	264.57
516	773598.3	3314229.0	264.51
517	773599.2	3314179.0	264.45
518	773600.2	3314129.0	264.45
519	773623.8	3314086.4	264.39
520	773652.3	3314045.3	264.35
521	773694.8	3314020.7	264.34
522	773740.1	3313999.6	264.30
523	773785.4	3313978.4	264.25
524	773833.9	3313974.8	264.22
525	773883.7	3313978.6	264.20
526	773933.6	3313982.4	264.19
527	773983.5	3313986.2	264.13
528	774033.3	3313989.9	264.03
529	774083.2	3313993.7	263.93
530	774133.0	3313997.5	263.76
531	774182.9	3314001.3	263.60
532	774232.8	3314004.8	263.39
533	774282.4	3314010.0	263.36
534	774331.8	3314017.7	263.36
535	774381.3	3314025.4	263.37
536	774430.5	3314034.2	263.35
537	774479.6	3314043.3	263.34
538	774528.8	3314052.4	263.28
539	774577.3	3314064.0	263.12
540	774624.2	3314081.2	262.91
541	774671.1	3314098.5	262.71
542	774717.6	3314117.0	262.62
543	774764.0	3314135.5	262.56
544	774810.4	3314154.1	262.55
545	774856.8	3314172.9	262.55
546	774903.2	3314191.4	262.61
547	774950.8	3314206.8	262.64
548	774998.4	3314222.1	262.60
549	775046.0	3314237.5	262.56
550	775093.5	3314252.9	262.50
551	775141.1	3314268.2	262.47
552	775188.7	3314283.2	262.36
553	775238.7	3314283.4	262.20
554	775288.7	3314284.9	262.12
555	775338.7	3314285.7	262.12
556	775388.7	3314287.6	262.18
557	775438.6	3314289.4	262.34
558	775488.6	3314291.3	262.57
559	775538.6	3314293.1	262.61
560	775588.5	3314295.0	262.59
561	775638.5	3314296.8	262.51

562	775688.4	3314298.4	262.36
563	775737.5	3314288.5	262.26
564	775786.5	3314278.7	262.19
565	775835.5	3314268.8	262.09
566	775884.5	3314259.0	261.98
567	775929.8	3314239.3	261.89
568	775973.2	3314214.4	261.78
569	776016.6	3314189.6	261.70
570	776060.0	3314164.8	261.62
571	776103.4	3314139.9	261.79
572	776137.8	3314105.1	261.80
573	776165.8	3314063.6	261.33
574	776193.7	3314022.2	261.11
575	776222.0	3313981.1	260.99
576	776260.6	3313949.2	260.87
577	776299.1	3313917.4	260.79
578	776337.7	3313885.5	260.73
579	776373.5	3313851.4	260.68
580	776399.1	3313808.4	260.62
581	776424.6	3313765.4	260.56
582	776450.2	3313722.4	260.51
583	776472.0	3313677.8	260.47
584	776487.1	3313630.1	260.49
585	776502.1	3313582.4	260.53
586	776517.2	3313534.8	260.51
587	776532.3	3313487.1	260.49
588	776542.3	3313438.7	260.44
589	776540.1	3313388.8	260.37
590	776537.9	3313338.8	260.27
591	776535.6	3313288.9	260.18
592	776516.8	3313246.8	260.09
593	776479.6	3313213.3	259.98
594	776441.0	3313182.1	259.85
595	776401.8	3313153.3	259.72
596	776374.7	3313111.3	259.58
597	776353.7	3313066.1	259.46
598	776343.9	3313018.3	259.36
599	776358.8	3312975.2	259.49
600	776401.1	3312948.4	259.16
601	776444.3	3312923.2	259.31
602	776486.5	3312896.6	259.92
603	776526.2	3312866.3	259.47
604	776569.0	3312840.4	259.21
605	776611.7	3312814.5	259.45
606	776654.5	3312788.6	260.13
607	776694.4	3312758.5	261.30
608	776733.7	3312727.6	258.80

609	776773.0	3312696.7	258.82
610	776782.2	3312650.2	259.34
611	776784.8	3312600.2	259.04
612	776781.9	3312550.5	259.04
613	776776.7	3312500.7	259.48
614	776781.2	3312451.1	258.67
615	776796.5	3312404.4	258.72
616	776819.9	3312360.1	258.91
617	776843.2	3312315.9	259.04
618	776870.2	3312273.8	258.93
619	776897.2	3312231.8	258.60
620	776924.3	3312189.8	258.60
621	776951.4	3312147.7	258.55
622	776973.0	3312102.7	258.44
623	776993.3	3312057.0	258.31
624	777013.6	3312011.3	258.17
625	777033.9	3311965.6	258.12
626	777054.2	3311920.0	258.07
627	777072.7	3311874.2	257.98
628	777096.9	3311830.6	257.51
629	777126.8	3311790.4	257.52
630	777170.3	3311766.2	257.51
631	777217.0	3311749.3	257.56
632	777265.4	3311737.0	257.56
633	777314.3	3311726.4	257.54
634	777363.3	3311716.5	257.38
635	777412.3	3311706.6	257.43
636	777457.4	3311685.0	257.53
637	777502.5	3311663.4	257.93
638	777547.5	3311641.7	258.18
639	777592.6	3311620.0	257.70
640	777629.1	3311588.6	257.52
641	777656.2	3311546.6	257.60
642	777683.3	3311504.6	257.27
643	777696.5	3311458.1	257.29
644	777699.2	3311408.2	257.60
645	777702.0	3311358.2	257.91
646	777701.1	3311308.5	258.08
647	777693.1	3311259.1	257.92
648	777684.6	3311209.9	257.71
649	777671.5	3311161.6	257.38
650	777658.4	3311113.4	257.71
651	777647.7	3311064.9	257.84
652	777658.5	3311017.7	258.76
653	777690.1	3310979.0	259.59
654	777726.0	3310944.5	258.56
655	777764.3	3310912.3	258.53

656	777802.5	3310880.0	258.32
657	777840.7	3310847.8	257.99
658	777878.9	3310815.5	257.51
659	777917.1	3310783.2	257.31
660	777955.3	3310751.0	257.16
661	777993.5	3310718.7	257.06
662	778031.4	3310686.1	257.00
663	778069.2	3310653.4	256.99
664	778107.0	3310620.7	256.97
665	778145.1	3310588.3	257.11
666	778188.2	3310563.1	257.13
667	778231.4	3310537.8	257.09
668	778273.9	3310511.7	256.92
669	778313.0	3310480.5	256.47
670	778352.0	3310449.2	255.87
671	778391.5	3310418.5	255.78
672	778433.3	3310391.2	255.73
673	778475.6	3310364.8	255.65
674	778518.6	3310339.3	255.58
675	778561.7	3310313.9	255.51
676	778604.1	3310287.4	255.44
677	778646.2	3310260.5	255.37
678	778685.9	3310230.1	255.30
679	778724.9	3310198.8	255.78
680	778765.5	3310169.8	255.73
681	778807.0	3310141.9	255.65
682	778848.4	3310113.8	255.58
683	778889.4	3310085.3	255.51
684	778930.5	3310056.7	255.44
685	778971.4	3310028.0	254.94
686	779012.2	3309999.1	255.84
687	779053.1	3309970.3	255.66
688	779095.0	3309943.1	256.29
689	779137.1	3309916.0	256.14
690	779179.1	3309889.0	256.57
691	779221.2	3309861.9	256.30
692	779263.9	3309836.0	256.18
693	779307.1	3309810.7	254.99
694	779350.2	3309785.5	254.31
695	779393.3	3309760.2	254.15
696	779436.5	3309734.9	254.16
697	779476.1	3309704.6	254.14
698	779515.2	3309673.5	254.13
699	779558.5	3309648.4	254.32
700	779601.7	3309623.3	254.42
701	779641.6	3309593.5	254.65
702	779679.3	3309560.6	254.81

703	779717.4	3309528.3	255.02
704	779755.6	3309496.1	255.07
705	779792.3	3309462.1	255.20
706	779830.0	3309429.3	255.16
707	779868.9	3309398.0	255.13
708	779906.4	3309364.9	255.13
709	779944.9	3309333.1	255.10
710	779983.5	3309301.2	254.83
711	780021.9	3309269.3	254.65
712	780060.8	3309237.9	254.33
713	780098.8	3309205.3	254.17
714	780137.4	3309173.5	254.16
715	780176.9	3309142.9	254.09
716	780218.3	3309115.0	253.93
717	780260.5	3309088.2	253.93
718	780293.3	3309050.8	253.95
719	780325.9	3309012.9	253.98
720	780360.0	3308976.4	253.98
721	780395.3	3308941.0	253.96
722	780430.9	3308905.9	253.66
723	780466.7	3308871.0	253.56
724	780502.4	3308836.0	253.50
725	780539.5	3308802.5	253.53
726	780577.6	3308770.2	253.47
727	780619.6	3308743.0	253.31
728	780660.2	3308714.2	253.19
729	780701.0	3308685.4	253.23
730	780745.0	3308662.3	253.08
731	780791.8	3308644.7	252.92
732	780838.0	3308625.6	252.95
733	780884.3	3308606.8	253.16
734	780930.6	3308587.8	253.67
735	780974.7	3308564.3	253.98
736	781018.9	3308540.9	254.00
737	781062.6	3308516.6	254.12
738	781106.3	3308492.3	254.30
739	781150.2	3308468.4	254.56
740	781192.9	3308442.4	254.66
741	781235.0	3308415.4	254.68
742	781277.3	3308388.8	254.68
743	781320.8	3308364.2	254.69
744	781362.6	3308336.7	254.56
745	781405.1	3308310.5	254.16
746	781448.6	3308285.8	253.75
747	781491.4	3308259.9	253.78
748	781535.6	3308236.7	253.75
749	781581.0	3308215.9	253.67

750	781628.6	3308200.4	253.67
751	781676.3	3308185.5	253.44
752	781723.9	3308183.6	253.32
753	781769.4	3308204.3	253.36
754	781817.8	3308197.8	253.47
755	781866.6	3308186.9	253.50
756	781915.4	3308176.1	253.56
757	781964.6	3308181.1	253.51
758	782013.8	3308189.9	253.55
759	782063.0	3308198.6	253.61
760	782103.7	3308224.1	253.82
761	782139.4	3308259.0	253.90
762	782175.2	3308294.0	253.86
763	782211.0	3308328.9	253.70
764	782246.0	3308364.6	253.54
765	782280.8	3308400.5	253.15
766	782315.6	3308436.4	253.20
767	782354.2	3308467.1	253.16
768	782401.2	3308481.2	253.23
769	782451.1	3308485.0	253.12
770	782501.0	3308485.5	253.13
771	782551.0	3308484.6	253.20
772	782599.6	3308476.4	253.14
773	782646.2	3308458.3	253.05
774	782692.8	3308440.3	252.98
775	782739.4	3308422.2	253.01
776	782783.9	3308399.5	252.70
777	782828.3	3308376.4	252.53
778	782871.8	3308351.8	252.56
779	782914.1	3308325.2	252.56
780	782956.4	3308298.5	252.23
781	782998.7	3308271.9	252.08
782	783041.0	3308245.2	252.14
783	783083.2	3308218.5	252.48
784	783112.9	3308180.6	252.71
785	783134.3	3308135.4	252.80
786	783156.1	3308090.4	252.82
787	783178.0	3308045.4	252.92
788	783199.6	3308000.3	252.97
789	783217.7	3307953.7	253.10
790	783235.7	3307907.1	253.16
791	783253.8	3307860.5	253.03
792	783271.9	3307813.9	252.88
793	783291.3	3307767.8	252.76
794	783310.9	3307721.8	252.75
795	783330.4	3307675.8	252.80
796	783350.0	3307629.8	252.67

797	783372.4	3307585.1	252.72
798	783398.8	3307542.7	252.73
799	783425.2	3307500.2	252.68
800	783451.6	3307457.7	252.58
801	783478.0	3307415.3	252.43
802	783504.4	3307372.8	252.29
803	783530.8	3307330.3	252.03
804	783557.2	3307287.9	251.88
805	783583.6	3307245.4	251.90
806	783607.5	3307201.6	251.98
807	783630.4	3307157.1	252.04
808	783653.2	3307112.6	252.15
809	783676.1	3307068.1	251.93
810	783699.0	3307023.7	251.86
811	783721.8	3306979.2	251.23
812	783744.7	3306934.7	249.81
813	783767.5	3306890.3	249.51
814	783782.5	3306843.0	249.35
815	783793.0	3306794.1	249.28
816	783803.5	3306745.2	249.19
817	783804.3	3306695.3	249.62
818	783803.9	3306645.3	249.88
819	783803.5	3306595.3	249.71
820	783803.1	3306545.3	250.17
821	783802.7	3306495.3	250.15
822	783802.3	3306445.3	249.23
823	783802.5	3306395.4	249.91
824	783807.1	3306345.6	251.02
825	783811.6	3306295.8	251.23
826	783816.1	3306246.0	251.55
827	783823.8	3306196.6	252.62
828	783832.0	3306147.3	252.42
829	783840.2	3306097.9	252.08
830	783848.4	3306048.6	251.80
831	783864.2	3306001.2	251.67
832	783880.4	3305953.9	251.41
833	783896.6	3305906.6	251.10
834	783912.8	3305859.3	250.56
835	783929.0	3305812.0	250.34
836	783944.1	3305764.4	250.12
837	783956.5	3305715.9	249.84
838	783968.9	3305667.5	249.69
839	783981.3	3305619.1	249.89
840	783993.7	3305570.6	249.93
841	784006.1	3305522.2	249.92
842	784015.9	3305473.2	249.90
843	784023.8	3305423.8	249.80

844	784032.3	3305374.6	249.80
845	784049.1	3305327.5	249.96
846	784066.0	3305280.5	250.00
847	784087.1	3305235.3	250.00
848	784110.8	3305191.2	249.98
849	784137.3	3305149.0	249.97
850	784167.6	3305109.3	249.91
851	784205.5	3305078.4	249.82
852	784249.6	3305054.8	249.74
853	784294.2	3305032.3	249.60
854	784339.9	3305012.0	249.45
855	784385.6	3304991.7	249.31
856	784434.5	3304982.0	249.14
857	784483.7	3304973.1	249.07
858	784532.9	3304964.2	249.09
859	784582.6	3304959.2	249.07
860	784632.5	3304955.0	249.16
861	784682.4	3304952.7	249.21
862	784732.4	3304952.0	249.16
863	784782.4	3304951.3	249.06
864	784832.4	3304950.8	248.85
865	784882.4	3304950.3	248.61
866	784932.4	3304949.8	248.36
867	784982.4	3304950.7	248.24
868	785032.3	3304952.3	248.11
869	785080.7	3304962.1	248.13
870	785127.8	3304978.9	248.04
871	785172.1	3305001.5	248.05
872	785213.6	3305029.0	248.06
873	785245.6	3305067.5	248.03
874	785276.3	3305106.9	247.84
875	785305.7	3305147.3	247.65
876	785334.4	3305188.2	247.74
877	785360.3	3305231.0	247.86
878	785386.1	3305273.8	248.03
879	785417.7	3305311.7	248.02
880	785455.8	3305344.1	248.16
881	785500.4	3305366.2	248.09
882	785547.2	3305383.7	247.91
883	785595.2	3305395.4	247.72
884	785645.2	3305393.9	247.76
885	785693.5	3305382.9	248.01
886	785741.0	3305367.3	248.14
887	785788.4	3305351.5	248.19
888	785830.2	3305324.1	248.07
889	785872.0	3305296.6	247.92
890	785911.3	3305266.2	247.85

891	785946.0	3305230.2	247.79
892	785980.7	3305194.2	247.72
893	786015.3	3305158.1	247.80
894	786049.6	3305121.7	247.92
895	786083.9	3305085.3	248.06
896	786118.2	3305048.9	248.14
897	786150.8	3305011.4	248.13
898	786169.9	3304965.2	248.03
899	786189.0	3304919.0	247.84
900	786208.1	3304872.8	247.56
901	786227.3	3304826.6	247.40
902	786233.2	3304777.3	247.33
903	786237.2	3304727.4	247.24
904	786241.5	3304677.6	247.07
905	786246.1	3304627.8	247.27
906	786250.6	3304578.0	247.70
907	786255.2	3304528.2	247.87
908	786255.1	3304478.2	247.95
909	786255.0	3304428.2	247.85
910	786257.2	3304378.4	247.76
911	786263.8	3304328.8	247.17
912	786270.5	3304279.3	246.72
913	786292.5	3304235.4	246.46
914	786319.6	3304193.4	246.21
915	786346.8	3304151.4	246.21
916	786373.9	3304109.4	246.41
917	786398.0	3304065.7	246.81
918	786421.1	3304021.3	247.00
919	786441.9	3303975.9	247.02
920	786460.0	3303929.3	246.89
921	786478.2	3303882.7	246.77
922	786490.4	3303834.4	246.66
923	786501.1	3303785.5	246.62
924	786504.9	3303736.4	246.61
925	786498.7	3303686.7	246.59
926	786479.0	3303641.7	246.54
927	786449.9	3303601.1	246.52
928	786424.7	3303558.7	246.51
929	786406.4	3303512.3	246.49
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932	786309.1	3303399.1	246.35
933	786275.3	3303362.2	246.34
934	786241.4	3303325.5	246.34
935	786208.8	3303287.6	246.34
936	786176.1	3303249.7	246.38
937	786144.0	3303211.4	246.29

938	786111.9	3303173.1	246.00
939	786079.8	3303134.8	245.88
940	786047.7	3303096.5	245.84
941	786021.0	3303054.3	245.80
942	785995.5	3303011.2	245.81
943	785970.0	3302968.3	245.84
944	785942.8	3302926.3	245.90
945	785915.5	3302884.4	246.00
946	785888.3	3302842.5	246.09
947	785866.8	3302797.8	246.09
948	785851.7	3302750.2	246.05
949	785836.6	3302702.5	245.98
950	785822.9	3302654.5	245.89
951	785812.1	3302605.6	245.73
952	785801.4	3302556.8	245.65
953	785793.0	3302508.0	245.67
954	785804.5	3302459.3	245.76
955	785816.1	3302410.7	245.91
956	785827.6	3302362.0	245.96
957	785868.6	3302336.4	245.96
958	785913.0	3302313.3	245.88
959	785957.3	3302290.3	245.70
960	786005.5	3302293.5	245.51
961	786054.5	3302303.3	245.35
962	786090.8	3302336.8	245.13
963	786125.9	3302372.3	244.83
964	786143.5	3302418.5	244.77
965	786158.6	3302466.2	244.68
966	786173.7	3302513.8	244.48
967	786188.8	3302561.5	242.82
968	786220.0	3302599.5	243.27
969	786254.8	3302635.5	243.79
970	786289.6	3302671.4	243.82
971	786326.4	3302704.8	242.41
972	786369.2	3302730.5	244.39
973	786412.1	3302756.2	244.62
974	786460.5	3302760.1	244.59
975	786510.5	3302757.8	245.03
976	786560.3	3302754.4	244.86
977	786610.1	3302749.8	244.85
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979	786707.7	3302731.1	244.95
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981	786803.5	3302703.5	245.10
982	786851.4	3302691.8	245.19
983	786899.4	3302679.9	245.34
984	786946.7	3302663.7	245.56

985	786993.4	3302645.8	245.20
986	787039.4	3302626.3	245.08
987	787085.5	3302606.8	245.07
988	787125.3	3302578.3	244.95
989	787159.7	3302542.0	244.81
990	787194.1	3302505.7	244.60
991	787226.5	3302467.7	244.39
992	787245.8	3302422.9	244.16
993	787257.0	3302374.2	244.06
994	787265.9	3302325.1	244.02
995	787272.3	3302275.5	244.02
996	787273.7	3302225.8	243.98
997	787268.0	3302176.2	243.98
998	787261.5	3302126.6	244.02
999	787250.0	3302078.0	244.20
1000	787238.4	3302029.3	244.28
1001	787226.9	3301980.7	244.49
1002	787209.4	3301933.9	244.62
1003	787191.3	3301887.3	244.57
1004	787173.2	3301840.7	244.44
1005	787168.3	3301791.3	244.28
1006	787172.2	3301741.9	244.03
1007	787183.7	3301693.3	243.85
1008	787204.5	3301650.3	243.72
1009	787243.0	3301618.5	243.67
1010	787282.2	3301587.6	243.75
1011	787328.1	3301567.9	243.81
1012	787377.6	3301560.9	243.72
1013	787426.6	3301551.5	243.60
1014	787475.4	3301540.5	243.71
1015	787524.2	3301529.5	243.61
1016	787569.4	3301508.7	243.23
1017	787613.7	3301485.5	243.11
1018	787650.9	3301453.3	243.03
1019	787684.3	3301416.0	242.98
1020	787717.6	3301378.8	243.00
1021	787740.8	3301335.4	243.08
1022	787758.5	3301288.6	243.10
1023	787778.5	3301242.8	243.10
1024	787799.2	3301197.3	243.08
1025	787819.9	3301151.7	243.03
1026	787840.5	3301106.2	243.09
1027	787853.5	3301057.9	243.15
1028	787866.5	3301009.6	243.24
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1030	787891.7	3300912.9	243.38
1031	787903.5	3300864.3	243.41

1032	787912.9	3300815.2	243.44
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1034	787930.6	3300716.8	243.47
1035	787941.9	3300668.1	243.55
1036	787955.9	3300620.1	243.67
1037	787969.9	3300572.1	243.81
1038	787984.0	3300524.2	243.90
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1042	788039.9	3300332.8	243.77
1043	788061.9	3300287.9	243.74
1044	788084.0	3300243.1	243.69
1045	788107.1	3300198.7	243.61
1046	788130.7	3300154.7	243.44
1047	788154.4	3300110.6	243.30
1048	788176.0	3300065.6	243.32
1049	788195.7	3300019.6	243.06
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1051	788226.4	3299924.9	243.04
1052	788237.8	3299876.2	243.02
1053	788255.5	3299829.6	243.00
1054	788278.6	3299785.6	242.93
1055	788310.9	3299747.6	242.84
1056	788346.3	3299712.3	242.70
1057	788374.9	3299672.1	242.53
1058	788373.2	3299628.9	242.43
1059	788364.3	3299584.2	242.42
1060	788329.3	3299563.2	242.42
1061	788326.4	3299523.6	242.37
1062	788295.8	3299487.0	242.34
1063	788262.5	3299449.8	242.29
1064	788229.8	3299412.0	242.28
1065	788197.0	3299374.2	242.30
1066	788163.6	3299337.0	242.26
1067	788129.7	3299300.3	242.24
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1069	788061.8	3299226.8	242.34
1070	788028.9	3299189.2	242.40
1071	787996.8	3299150.9	242.37
1072	787964.6	3299112.6	242.31
1073	787932.5	3299074.3	242.23
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1083	787619.4	3298684.6	241.55
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1085	787559.5	3298604.5	241.34
1086	787529.5	3298564.4	241.30
1087	787502.4	3298522.6	241.32
1088	787478.7	3298478.6	241.33
1089	787454.9	3298434.6	241.32
1090	787431.1	3298390.6	241.26
1091	787407.4	3298346.6	241.21
1092	787383.4	3298302.7	241.21
1093	787359.5	3298258.8	241.23
1094	787348.2	3298213.7	241.28
1095	787363.8	3298166.2	241.21
1096	787383.4	3298120.2	241.10
1097	787402.9	3298074.2	240.88
1098	787422.3	3298028.1	240.77
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1118	787790.0	3297098.3	241.18
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1120	787825.5	3297004.8	241.16
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1122	787861.0	3296911.3	241.04
1123	787875.0	3296863.4	240.80
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1125	787897.3	3296766.0	240.56

1126	787904.2	3296716.5	240.45
1127	787913.7	3296667.4	240.26
1128	787923.4	3296618.3	240.17
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1131	787935.0	3296471.1	240.12
1132	787918.8	3296424.0	240.14
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1137	787805.4	3296201.4	239.99
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1139	787735.7	3296131.3	239.92
1140	787730.0	3296088.7	239.90
1141	787724.3	3296050.6	239.95
1142	787708.4	3296003.8	239.91
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1144	787641.8	3295944.3	239.74
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1146	787645.9	3295851.9	239.73
1147	787672.1	3295810.7	239.87
1148	787715.2	3295795.0	240.08
1149	787756.0	3295798.3	240.28
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1152	787864.6	3295718.8	240.24
1153	787888.7	3295682.7	240.12
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1165	788072.9	3295198.3	239.44
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1167	788079.4	3295098.6	239.65
1168	788084.0	3295048.8	239.65
1169	788076.9	3295000.8	239.66
1170	788042.2	3294965.1	239.61
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1173	787915.0	3294885.7	239.02
1174	787873.5	3294857.9	238.86
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1176	787789.5	3294803.6	238.54
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1179	787663.2	3294722.9	238.42
1180	787622.1	3294694.4	238.39
1181	787581.7	3294665.6	238.36
1182	787557.7	3294622.4	238.33
1183	787543.9	3294574.3	238.30
1184	787528.9	3294526.7	238.22
1185	787513.2	3294479.2	238.19
1186	787499.6	3294431.1	238.16
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1196	787227.2	3294014.5	238.04
1197	787197.6	3293974.2	238.08
1198	787168.0	3293933.9	238.11
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1200	787107.7	3293854.0	238.13
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1202	787047.4	3293774.3	238.15
1203	787023.2	3293730.9	238.14
1204	786993.4	3293690.7	238.13
1205	786963.6	3293650.6	238.11
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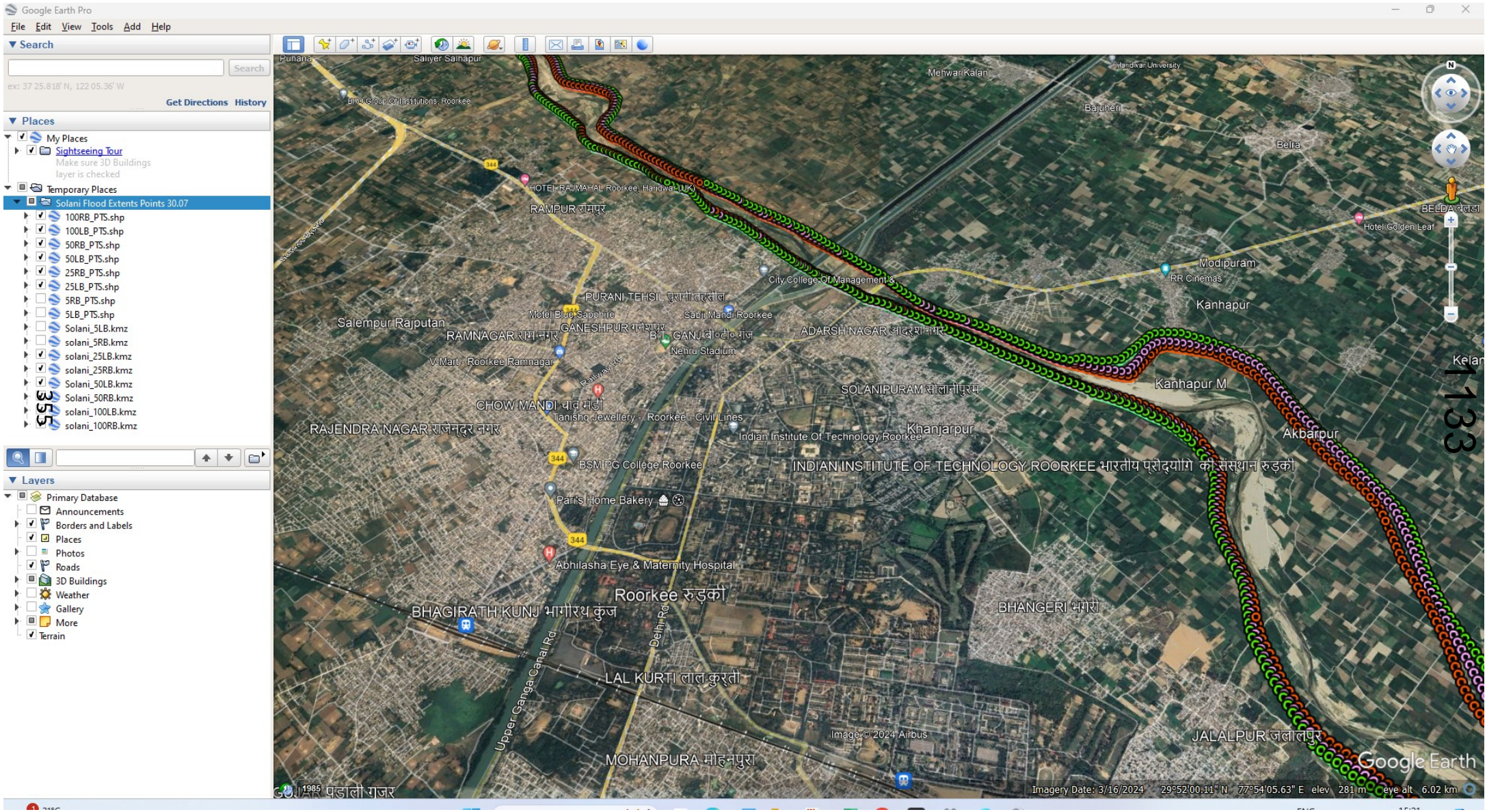
Google Earth Pro
File Edit View Tools Add Help
Search
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Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
Temporary Places
Solani Flood Extents Points 30.07
100RB_PTS.shp
100LB_PTS.shp
50RB_PTS.shp
50LB_PTS.shp
25RB_PTS.shp
25LB_PTS.shp
5RB_PTS.shp
5LB_PTS.shp
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solani_25RB.kmz
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Solani_50RB.kmz
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Layers
Primary Database
Announcements
Borders and Labels
Places
Photos
Roads
3D Buildings
Weather
Gallery
More
Terrain
Puhana
Saiyer Salhapur
Mehwar Kalan
Haridwar University
Bajuheri
Belra
HOTEL RAJMAHAL Roorkee, Haridwar (UK)
RAMPUR रामपुर
BELDA बेलडा
Hotel Golden Leaf
Modipuram
RR Cinemas
City College Of Management &
PURANI TEHSIL पुरानी तहसील
Motel Blue Sapphire
Sabzi Mandi Roorkee
Kanhapur
Salempur Rajputan
RAMNAGAR राम नगर
GANESHPUR गणेशपुर
GANJ गंज
ADARSH NAGAR आदर्श नगर
Nehru Stadium
V Mart - Roorkee Ramnagar
SOLANIPURAM सोलानीपुरम
Kanhapur M
CHOW MANDI चौक मंडी
Tanishq Jewellery - Roorkee - Civil Lines
RAJENDRA NAGAR राजेन्द्र नगर
Indian Institute Of Technology Roorkee
Khanjarpur
Akbarpur
BSM PG College Roorkee
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE भारतीय प्रोद्योगिकी संस्थान रुड़की
Paris Home Bakery
Abhilasha Eye & Maternity Hospital
Roorkee रुड़की
BHAGIRATH KUNJ भागीरथ कुंज
BHANGERI भंगेरी
Delhi Rd
Upper Ganga Canal Rd
LAL KURTI लाल कुरती
Image © 2024 Airbus
JALALPUR जलालपुर
MOHANPURA मोहनपुरा
GUJAR पडाली गुजर
Google Earth
Imagery Date: 3/16/2024 29°52'00.11" N 77°54'05.63" E elev 281 m eye alt 6.02 km
1133
355

Annexure No. 3

Annexure-2

कार्यालय अधिशासी अभियन्ता
उत्तरी खण्ड गंगा नहर, रुड़की

पत्रांकः— 1932 /उखगनरू/एस0टी0पी0, दिनांकःरुड़की: 21/06/ 2024

विषयः— मा0 नेशनल ग्रीन ट्रिब्यूनल (ए.10जी0टी0) मे योजित मूल आवेदन संख्या— 632/2022 वी0के0 त्यागी बनाम उत्तराखण्ड राज्य व अन्य में पारित आदेश दिनांक 30.04.2024 के द्वारा उपजिलाधिकारी, रुड़की द्वारा दिनांक 12.06.2024 को एक आहूत बैठक में बिन्दुवार आख्या के सम्बन्ध में।

क्षेत्रीय प्रदूषण नियन्त्रण अधिकारी, रुड़की।

उक्त आहूत बैठक के कम में प्रश्नगत प्रकरण के अन्तर्गत इस खण्ड से सम्बन्धित बिन्दुओ पर आख्या निम्नवत् हैः—

1. सोलानी नदी का फ्लड प्लेन क्षेत्र का निर्धारण कार्य जल विज्ञान खण्ड, बहादराबाद द्वारा किया जा रहा है फ्लड प्लेन जोन निर्धारण के उपरान्त एस0पी0एस0 हेतु अनापत्ति की कार्यवाही की जायेगी।
2. सिंचाई विभाग, उ0प्र0 का नियन्त्रण सोलानी नदी में सोलानी एक्वाडक्ट से 1000 मी0 अपस्ट्रीम एवं 500 मी0 डाउनस्ट्रीम पर है शेष सोलानी नदी का भाग जनपद हरिद्वार, उत्तराखण्ड में पडता है, उदगम स्थल से उत्तराखण्ड राज्य में पडने वाली सोलानी नदी के भाग का बाढ परिक्षेत्रण निर्धारण का कार्य जल विज्ञान खण्ड, बहादराबाद द्वारा किया जा रहा है।
3. उत्तरी खण्ड गंगा नहर के नियन्त्रणाधीन सोलानी नदी के क्षेत्र में किसी प्रकार का कोई स्थाई अतिक्रमण नही है कृषि कार्य हेतु पट्टे आवन्टित किये गये थे जिनको निरस्त करने के उपरान्त मौके से अतिक्रमण हटा दिया गया था वर्तमान में किसी प्रकार का कोई अतिक्रमण नही है।
4. सोलनी नदी में मिलने वाले 07 ड्रेन जोकि घरेलू अशुद्धिकृत उतप्रवाह को carry करते है यह सभी ड्रेन नगर निगम क्षेत्र रूडकी के अन्तर्गत पडने के कारण सभी नालों का रख—रखाव नगर निगम, रूडकी द्वारा किया जाता है जिस पर नाला टैपिंग आदि कार्यो की अनापत्ति हेतु यथाप्रस्ताव कार्यवाही कर दी जाये।

कृपया उक्तानुसार कार्यवाही करने का कष्ट करें।

अधिशासी अभियन्ता
उत्तरी खण्ड गंगा नहर
रुड़की

पत्रांकः— /उखगनरू/एस0टी0पी0, तदिनांकः

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित हैः—

1. अधीक्षण अभियन्ता, गंगा नहर संचालन मण्डल, मेरठ।
2. ज्वाइंट मजिस्ट्रेट, रुड़की।
3. सहायक अभियन्ता—तृतीय/उपराजस्व अधिकारी, उत्तरी खण्ड गंगा नहर, रुड़की।
4. कोर्ट अनुभाग, उत्तरी खण्ड गंगा नहर, रुड़की।

अधिशासी अभियन्ता
उत्तरी खण्ड गंगा नहर
रुड़की

Annexure No. 4

उत्तर प्रदेश सरकार
सिंचाई एवं जल संसाधन विभाग

कार्यालय अधिशासी अभियन्ता
Office of The Executive Engineer
उत्तरी खण्ड गंगा नहर, रूडकी
Northern Division Ganga Canal, Roorkee

गंगोत्री भवन कैम्पस, मलकपुर चुँगी, रूडकी
Gangotri Bhavan Campus, Malakpur
Chungi. Roorkee-247667
E.mail:- eendgcrke@gmail.com

पत्रांक 1859 /उखगनरू/अनापत्ति, दिनांक 27/07/ 2024

विषयः– **माननीय राष्ट्रीय हरित प्रधिकरण में योजित मूल आवेदन संख्या– 632/2022 वी0के0 त्यागी बनाम उत्तराखण्ड राज्य व अन्य में पारित आदेश दिनांक 30.04.2024 के अनुपालन के सम्बन्ध में।**

सन्दर्भः– **आपका पत्रांक 1759/कार्य–25/21, दिनांक 15.06.2024**

परियोजना प्रबन्धक, निर्माण एवं अनुरक्षण इकाई (गंगा), उत्तराखण्ड पेयजल निगम, जगजीतपुर, पोस्ट–कनखल, हरिद्वार–249408

उपरोक्त विषयक सन्दर्भित पत्र का अवलोकन करें। माननीय राष्ट्रीय हरित प्राधिकरण में योजित मूल आवेदन संख्या 632/2022 वी0के0 त्यागी बनाम उत्तराखण्ड राज्य व अन्य में पारित आदेश दिनांक 30.04.2024 के अनुपालन एवं ज्वाइन्ट मजिस्ट्रेट महोदय, हरिद्वार के पत्रांक 328/पी0ए0, दिनांक 13.06.2024 के कार्यवृत्त के बिन्दु संख्या 04 के अनुपालन में नगर निगम, रूडकी, सिंचाई खण्ड रूडकी (उत्तराखण्ड), उत्तराखण्ड पेयजल निगम, राजस्व विभाग, रूडकी एवं इस खण्ड के अधिकारियों/कर्मचारियों द्वारा रूडकी स्थित सोलानी नदी में गिरने वाले नालों के टैपिंग, एस0पी0एस0, सीवर लाईन एवं राईजिंग मेन बिछाने हेतु संयुक्त निरीक्षण उपरान्त चिन्हित की गई भूमि का विवरण उपलब्ध कराते हुये विषयगत कार्यों हेतु भूमि को निःशुल्क उपलब्ध कराने हेतु इस कार्यालय को पत्र प्रेषित किया गया है।

इस सम्बन्ध में अवगत कराना है कि एन0जी0टी0 के मूल आवेदन संख्या–632/2022 के अन्तर्गत दिये गये निर्देशों के अनुपालन में सिंचाई विभाग, उत्तर प्रदेश एवं उत्तराखण्ड द्वारा सोलानी नदी के फ्लड प्लेन जोन का निर्धारण उपरान्त निर्देशित मानकों के आलोक में विषयगत भूमि पर अनापत्ति/अनुमति सम्बन्धित कार्यवाही किया जाना सम्भव हो सकेगा।

अधिशासी अभियन्ता
उत्तरी खण्ड़ गंगा नहर
रूड़की

पत्रांक /उखगनरू/तदिनांक 2024

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित हैः–

1. जिलाधिकारी महोदय, हरिद्वार।
2. ज्वाइन्ट मजिस्ट्रेट महोदय, रूडकी।
3. अधीक्षण अभियन्ता, मध्य गंगा नहर निर्माण मण्डल, रूडकी।

अधिशासी अभियन्ता
उत्तरी खण्ड़ गंगा नहर
रूड़की

कार्यालय परियोजना प्रबन्धक, निर्माण एवं अनुरक्षण
इकाई (गंगा), उत्तराखण्ड पेयजल निगम, हरिद्वार
पत्रांक 2210 /4/14-25/29 दिनांक 2/8/24
प्रतिलिपि: 1 Er. A.S. Bisht PE done

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Annexure No. 5

UTTARAKHAND POLLUTION CONTROL BOARD, REGIONAL OFFICE, ROORKEE

Surface Water Quality of D/s River Solani near U/s of Village Kuankhera, Haridwar for year 2023 and 2024

Month	Colour	Odour	Temperature (°C)	pH	TDS (mg/l)	EC (µS/cm)	DO (mg/l)	Chloride (mg/l)	Hardness (mg/l)	Calcium Hardness (mg/l)	Magnesium Hardness (mg/l)	Alkalinity (mg/l)	BOD (mg/l) 27°C for 3 days	COD (mg/l)	TC (MPN/100 ml)	FC (MPN/100 ml)	FS (MPN/100 ml)	Nitrate-N (mg/l)	Nitrite-N(mg/l)	Sulphate (mg/l)	Phosphate (mg/l)	Fluoride (mg/l)	Sodium (mg/l)	Potassium (mg/l)	SAR	Class of Water as per CPCB Designated Best Use
02-Jan-23	Colourless	Odourless	13.4	7.71	561	878	7.2	35	237	199	38	218	2.2	12	84	25	14	0.53	0.01	29.22	0.26	0.97	30.3	7.9	0.86	Class-B
07-Feb-23	Colourless	Odourless	19.2	8.10	472	737	6.2	30	140	88	52	204	2.0	15	94	58	21	0.55	0.02	25.8	0.30	0.55	28.6	6.6	1.04	Class-B
03-Mar-23	Colourless	Odourless	22.7	7.95	324	506	6.2	24	266	152	114	252	1.8	10	110	63	33	1.01	0.64	22.48	0.12	0.68	35.4	10	0.94	Class-B
13-Apr-23	Colourless	Odourless	22.0	8.00	315	492	7.8	22.0	271	150	121	244	2.0	8.3	84	49	17	0.52	0.03	22.6	0.34	0.54	30.8	9.6	0.81	Class-B
12-May-23	Colourless	Odourless	25.4	7.68	308	481	7.4	18.0	186	56	130	110	2.4	7	79	26	17	0.49	0.31	35.98	0.59	0.55	9.1	2.6	0.29	Class-B
21-Jun-23	Turbid	Odourless	22.1	8.10	277	432	7.6	20	280	145	135	120	2.1	8.4	110	32	14	0.76	0.31	27.27	0.13	0.70	31.2	9.4	0.81	Class-B
04-Jul-23	Turbid	Odourless	32.3	7.79	513	802	5.8	18	92	52	40	142	2.8	16	170	79	63	0.34	0.18	36.45	0.36	0.29	33.2	13.3	1.50	Class-B
19-Aug-23	Turbid	Odourless	24	7.52	198	312	6.5	16	115	62	53	138	2.6	10	150	41	27	0.64	0.28	32.45	0.47	0.49	28.6	11.3	1.16	Class-B
05-Sep-23	Turbid	Odourless	28.0	7.67	512	800	7.6	10	196	114	82	130	2.0	9	130	43	22	0.32	0.12	35.9	0.27	0.25	27.9	6.0	0.86	Class-B
05-Oct-23	Turbid	Odourless	27.3	7.90	210	328	6.0	16	322	215	107	340	2.8	12	110	46	17	1.75	0.32	30.21	0.15	0.72	20.1	9.6	0.49	Class-B
01-Nov-23	Turbid	Odourless	24.7	7.21	201	315	6.8	14	197	124	73	219	2.2	10	94	70	9.3	0.59	0.32	35.66	0.51	0.62	25.0	16.0	0.77	Class-B
04-Dec-23	Colourless	Odourless	20.6	8.04	200	313	7.8	12	225	110	115	185	1.8	16	120	70	9.2	0.99	0.33	29.41	0.16	0.68	21.0	10.1	0.61	Class-B
02-Jan-24	Colourless	Odourless	20.4	7.10	455	712	7.9	13	189	93	96	167	1.2	16	120	94	14	0.59	0.22	32.89	0.29	0.43	17.8	4.5	0.56	Class-B
06-Feb-24	Colourless	Odourless	16.5	7.60	320	500	7.8	14	200	102	98	175	2.2	20	110	79	17	0.99	0.33	33.54	0.18	0.48	18.6	11.2	0.57	Class-B
04-Mar-24	Turbid	Odourless	20.6	8.10	307	480	7.6	11	206	98	108	209	2.0	9	150	94	14	0.69	0.37	38.54	0.58	0.58	18.1	9.3	0.55	Class-B
04-Apr-24	Colourless	Odourless	20.0	7.20	310	484	7.8	16	160	75	85	173	2.0	14	120	84	7.8	0.59	0.35	34.57	0.22	0.48	30.8	8.7	1.05	Class-B
06-May-24	Colourless	Odourless	22.0	7.30	250	390	7.6	13	160	78	82	188	2.4	16	170	79	9.3	0.58	0.38	35.57	0.62	0.58	25.8	12.7	0.88	Class-B
13-Jun-24	Turbid	Odourless	21.5	7.15	350	547	7.6	14	190	100	90	170	2.6	18	220	140	9.3	0.74	0.33	33.54	0.61	0.5	18.4	10.8	0.58	Class-B
Acceptable limits (AL)/ Permissible limits (PL)				**(6.5-8.5)/ No relaxation**	500/2000 (mg/l)		**5 mg/l or more**	**250/1000 (mg/l)**	**200/600 (mg/l)**			**200/600 (mg/l)**	**3 mg/l or less**		**500 or less**			**(45 mg/l)/no relaxation**		**200/400 (mg/l)**		**1.0/1.5 (mg/l)**				

Annexure No. 6

UTTARAKHAND POLLUTION CONTROL BOARD, REGIONAL OFFICE, ROORKEE

Performance monitoring of data of 33 MLD capacity STP located at Saliyar (Roorkee) from January, 2023 to June, 2024

33 MLD, Saliyar, Roorkee	INLET			OUTLET			
	pH	BOD (mg/L)	TSS (mg/L)	pH	BOD (mg/L)	TSS (mg/L)	Fecal Coliform (MPN/100 ml)
Jan-23	7.70	225	206	7.60	86	96	>1600
Feb-23	7.56	175	265	7.76	24	52	110
Mar-23	7.31	255	280	7.62	10	50	220
Apr-23	7.49	255	295	7.67	22	78	170
May-23	7.90	235	210	7.98	12	20	110
Jun-23	7.53	275	250	7.81	40	62	920
Jul-23	7.64	220	240	7.82	24	30	920
Aug-23	7.23	170	320	7.56	26	20	280
Sep-23	7.32	210	220	7.88	14	26	84
Sep-23	7.12	120	360	7.58	16	20	220
	Joint monitoring with Uttarakhand Jal Sansthan						
Oct-23	7.23	255	260	7.68	28	30	1600
Nov-23	7.39	180	210	7.68	12	16	280
Dec-23	6.59	170	210	7.28	18.0	28.0	220
Jan-24	7.19	160	190	7.66	12.0	20.0	170
Feb-24	7.15	160	120	7.66	10.0	10.0	220
Mar-24	7.20	160	180	7.60	8.0	9.0	280
Apr-24	6.70	180	140	7.70	10.0	10.0	540
May-24	7.27	170	160	7.40	10.0	9.0	350
Jun-24	7.03	160	140	7.56	9.6	8.0	280
Prescribed Outlet Standards as per Hon'ble NGT				**5.5-9.0**	**<10**	**<20**	**<230**
Prescribed Outlet Standards as per MoEF&CC under E(P) Rules, 1986				**6.5-9.0**	**<30**	**<100**	**<1000**

Annexure No. 7

Minutes of the Meeting held on 26.07.2024 in compliance of order dated 30.04.2024 passed by the Hon'ble National Green Tribunal in the matter of O.A. No. 632 of 2022 titled as "VK Tyagi Versus State of Uttarakhand & Ors."

In compliance of order passed by the Hon'ble NGT in the matter of O.A. No 632 of 2022 titled as "VK Tyagi Versus State of Uttarakhand & Ors.", review meeting was held with the members of Joint Committee under the Chairmanship of Member Secretary, Uttarakhand Pollution Control Board, Dehradun on 26.07.2024. Following official and nominated members were participated the meeting virtually:

i) Dr. Y.R.S. Rao, Scientist 'G', National Institute of Hydrology, Roorkee.
ii) Dr. Pradeep Sachan, Scientist 'E', National Institute of Hydrology.
iii) Shri G.P. Srivastava, Chief Engineer - Ganga, UP Irrigation Department, Meerut.
iv) Shri Vipin Gupta, Scientist 'B', MoEFCC, Regional Office, Dehradun.
v) Shri Sanjeev Kumar Srivastava, Superintendent Engineer, Uttarakhand Irrigation Department, Dehradun.
vi) Shri P.L Nautiyal, Executive engineer, Irrigation department, Uttarakhand.
vii) Shri Vikas Tyagi, Executive Engineer, UP Irrigation Department, Roorkee.
viii) Shri Ankit Singh, Regional Officer, Uttar Pradesh Pollution Control Board, Regional Office, Muzaffarnagar.
ix) Shri Raman Kant, Grassroot Academy of Nature, Meerut (Non-Official Member).
x) Shri Vineet Kashyap, Development Researcher, New Delhi (Non-Official Member).
xi) Shri S.P. Singh, Regional Officer, Uttarakhand Pollution Control Board, Regional Office, Roorkee.
xii) Dr. Rajendra Singh, Scientific Officer, Uttarakhand Pollution Control Board, Dehradun.
xiii) Ms. Swati Kalra, JRF, Uttarakhand Pollution Control Board, Regional Office, Roorkee.

1. The Member Secretary, UKPCB welcomed all members of the Joint Committee and outlined the objectives of the meeting. With permission of Chair, Dr. Rajendra Singh, Scientific Officer, UKPCB briefed the background of application and latest order issued by the Hon'ble NGT. He informed that complaint was regarding encroachment in the river bed of Solani for cultivation which aversely affecting the flow of river. Discharge of polluted drains in to river Solani at Roorkee is also reported. These activities are having adverse impact on ecology of river Solani. Further, Hon'ble NGT constituted the Joint Committee for preparation of report for restoration of Ecology & aquatic life and in particular issues of:

O/C

i) Identification /demarcation of area of Sonali River and its translation on GIS Map;
ii) Rehabilitation and management of its catchment area;
iii) encroachments on the same and removal thereof;
iv) Tapping of all drains discharging in river Sonali by construction of STPs etc.;
v) Review of existing treatment facilities for treatment of industrial effluents and domestic sewage and improvements required to be made; and
vi) Reuse of treated water from STPs/CETPs for irrigation by connecting the same to irrigation canals/channels and industrial purposes by laying down pipelines connecting the concerned industries.

2. Member Secretary, UKPCB informed that the river Solani is non-perennial river and after receiving discharge of river Ratmao at downstream of Roorkee, flow is increase in river Solani. It was also informed that water quality monitoring of river Solani at Village Kuankheda is being carried out by Uttarakhand Pollution Control Board and analysis reports indicating Class "B" water quality as per CPCB's Water Quality Criteria. Further, Member Secretary invited the comments and progress made so far by the concerned departments in order to achieve the mandate of the Committee.

3. Shri P.L. Nautiyal, Executive Engineer, Uttarakhand Irrigation Department informed that for Flood Plain Zoning of river Solani, hydrological study with estimation of catchment area of river Solani has been completed and ground truthing is being done, which is expected to be completed by August, 2024. GIS map with demarcation of river Solani is now available and will be shared in KML format.

4. Shri Sanjeev Srivastava, Superintendent Engineer, Uttarakhand Irrigation Department stated that so far removal of encroachment on the bank of river Solani and rehabilitation is concerned, Irrigation Department has very limited role and same can be done by Administration /Nagar Nigam. Therefore, Members from District Administration and Nagar Nigam may be invited for meetings of the Joint Committee.

5. It was informed that there are 7 drains, having cumulative discharge of 5.43 MLD, have been identified and Uttarakhand Peyjal Nigam and prepared a proposal for Interception and Diversion (I&D) of these drains. It is proposed to divert these drains to STP of 33 MLD capacity located at Saliyar, Roorkee. Land required for I&Ds and SPS needs to be allotted by the Uttar Pradesh Irrigation department. Shri Vikas Tyagi, Executive Engineer, Uttar Pradesh Irrigation Department informed that proposal if any in this regard will be considered positively after establishing of status of HFL.

6. During the meeting it was informed that as such river Solani do not receive industrial effluent discharge from industries located in the catchment area. However, STP located at Saliyar discharge treated water in to river Solani.

O/C

Regional Officer, UPPCB, Muzaffarnagar also stated that no domestic and industrial waste water is discharge into river Solani in the State of UP.

7. Shri Raman Kant informed about his site visit along the river Solani and stated that considering the nature of river and its catchment characteristics, natural flow in the river may be generated through water recharging structures and large scale plantation etc. activities in the catchment area with active community participation. He also informed about report prepared by him and to be shared shortly with the Committee.

8. Dr. YRS Rao, Scientist, NIH Roorkee suggested that available information about the river Solani needs to be translated in to GIS map. During the course of discussion and considering the core competencies of NIH, Member Secretary, UKPCB requested Dr. Rao to lead the report writing part in the matter which was accepted by the Dr. Rao. All the required information will be made available to NIH by the concerned departments.

9. After due discussion and deliberations, following decision have been taken for compliance:

   i) Uttarakhand Irrigation Department will provide GIS map of demarcation of river Solani with available hydrological data and catchment details.

   Action: Executive Engineer, UK Irrigation Department.

   ii) The data related to the drains and its quality & quantity, Interception and Diversion plan etc. needs to be collected from Uttarakhand Peyjal Nigam and made available to NIH for further processing.

   Action: RO, UKPCB, Roorkee & NIH

   iii) Details of encroachments and their removal along the river Solani will be collected from Revenue department. Water quality assessment data of river Solani, performance assessment data of STP, connectivity to STPs etc. will be provided to NIH.

   Action: RO, UKPCB, Roorkee

   iv) The report prepared by Shri Raman Kant will also be shared with the Committee to record its field observations, recommendations and rejuvenation plan etc. to incorporate in the report of Joint Committee.

   Action: Shri Raman Kant, NIH & UKPCB

   v) In order to fulfillment of mandate of the Joint Committee and as a member of the Joint Committee, NIH will prepare the report on behalf of the Joint Committee. Administrative expenditure in this regard will be borne by UKPCB. NIH may share the inventory of additional information that would be required for preparation of report.

   Action: NIH & UKPCB

O/C

vi) Regional Officer, UKPCB, Roorkee will ensure co-ordination and collection of information from various departments and will made available them to NIH for further processing.

Action: RO, UKPCB, Roorkee

The meeting ended with vote of thanks to the Chair.

Dr. Parag Madhukar Dhakate
MEMBER SECRETARY

HEAD OFFICE
Uttarakhand Pollution Control Board
"Gauradevi Paryavaran Bhawan"
46B, IT Park, Sahastradhara Road, Dehradun
E-mail : msukpcb@yahoo.com

Ref. No.: UKPCB/HO/Gen-183-631/2024/ 692 **Date:02.08.2024**

BY E-MAIL

Copy to: Following for kind information and necessary action please.

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2. Dr. Pradeep Sachan, Scientist, NIH, Roorkee. (E-mail: pradeep.nihr@gov.in
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MEMBER SECRETARY