## Table 3-5 Pipe Length by ROU and Pipe Diameter

### A. Pipe Length, m

| Regional Operations Unit (ROU) | Pipe Diameter (mm) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 37 | 50 | 62 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 800 | Total |
| Ajlun | | | 165,916 | | 40,776 | 136,628 | 125 | 66,015 | 35,667 | 7,421 | 39 | | 8,931 | | | | 461,518 |
| Al Koura | 2,288 | | 129,922 | 110 | 5,499 | 37,259 | 6,233 | 15,322 | 22,395 | | | | 117 | | | | 219,145 |
| Bani Kinana | | | 200,516 | 2,705 | 32,642 | 71,583 | | 45,010 | 10,631 | | 1,510 | | 5,094 | | | | 369,691 |
| Bani Ubaid | | 301 | 155,520 | | 27,844 | 61,162 | | 13,687 | 11,903 | | 11,991 | 2,037 | 17,710 | | 20,047 | | 322,202 |
| Irbid | | 1,454 | 885,434 | | 38,721 | 316,523 | | 133,932 | 49,519 | 5,915 | 22,953 | 4,031 | 42,250 | 1,429 | 11,926 | 25,761 | 1,539,846 |
| Jerash | | | 299,735 | | 29,270 | 192,552 | | 66,715 | 27,367 | | 4,101 | | | | | | 619,739 |
| Mafraq | | | 430,311 | | 29,024 | 224,621 | | 128,710 | 51,885 | 1,941 | 27,596 | | 41,689 | 20,094 | 56,368 | | 1,012,239 |
| North Badia | | | 150,657 | | 19,696 | 68,178 | | 39,275 | 61,038 | 17,749 | 88 | | 69,336 | 20,210 | 10,616 | | 456,844 |
| Northern Shouna | | 39 | 87,463 | | 27,283 | 39,131 | | 42,276 | 31,515 | 2,605 | 7,990 | | | | 21,974 | | 260,276 |
| Ramtha | | | 113,869 | 58 | 64,937 | 34,985 | | 45,501 | 27,676 | 2,504 | 10,537 | | 5,208 | | | | 305,275 |
| **TOTAL** | 2,288 | 1,794 | 2,619,343 | 2,873 | 315,691 | 1,182,623 | 6,358 | 596,442 | 329,595 | 38,134 | 86,806 | 6,068 | 190,335 | 41,733 | 120,931 | 25,761 | 5,566,776 |

### B. Cumulative Pipe Length, Percent

| Regional Operations Unit (ROU) | Pipe Diameter (mm) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 37 | 50 | 62 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 800 | Total |
| Ajlun | 0.0% | 0.0% | 36.0% | 36.0% | 44.8% | 74.4% | 74.4% | 88.7% | 96.4% | 98.1% | 98.1% | 98.1% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Al Koura | 1.0% | 1.0% | 60.3% | 60.4% | 62.9% | 79.9% | 82.7% | 89.7% | 99.9% | 99.9% | 99.9% | 99.9% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Bani Kinana | 0.0% | 0.0% | 54.2% | 55.0% | 63.8% | 83.2% | 83.2% | 95.3% | 98.2% | 98.2% | 98.6% | 98.6% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Bani Ubaid | 0.0% | 0.1% | 48.4% | 48.4% | 57.0% | 76.0% | 76.0% | 80.2% | 83.9% | 83.9% | 87.6% | 88.3% | 93.8% | 93.8% | 100.0% | 100.0% | 100.0% |
| Irbid | 0.0% | 0.1% | 57.6% | 57.6% | 60.1% | 80.7% | 80.7% | 89.4% | 92.6% | 93.0% | 94.5% | 94.7% | 97.5% | 97.6% | 98.3% | 100.0% | 100.0% |
| Jerash | 0.0% | 0.0% | 48.4% | 48.4% | 53.1% | 84.2% | 84.2% | 94.9% | 99.3% | 99.3% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Mafraq | 0.0% | 0.0% | 42.5% | 42.5% | 45.4% | 67.6% | 67.6% | 80.3% | 85.4% | 85.6% | 88.3% | 88.3% | 92.4% | 94.4% | 100.0% | 100.0% | 100.0% |
| North Badia | 0.0% | 0.0% | 33.0% | 33.0% | 37.3% | 52.2% | 52.2% | 60.8% | 74.2% | 78.1% | 78.1% | 78.1% | 93.3% | 97.7% | 100.0% | 100.0% | 100.0% |
| Northern Shouna | 0.0% | 0.0% | 33.6% | 33.6% | 44.1% | 59.1% | 59.1% | 75.4% | 87.5% | 88.5% | 91.6% | 91.6% | 91.6% | 91.6% | 100.0% | 100.0% | 100.0% |
| Ramtha | 0.0% | 0.0% | 37.3% | 37.3% | 58.6% | 70.1% | 70.1% | 85.0% | 94.0% | 94.8% | 98.3% | 98.3% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| **TOTAL** | 0.0% | 0.1% | 47.1% | 47.2% | 52.8% | 74.1% | 74.2% | 84.9% | 90.8% | 91.5% | 93.1% | 93.2% | 96.6% | 97.4% | 99.5% | 100.0% | 100.0% |

**Table 3-6 Number of Flow Monitoring Meters by Function**

| Metering Function | Status | | | |
|---|---|---|---|---|
| | Active | Abandoned | Planned | Total |
| Transmission Output Meters | 20 | | 11 | 31 |
| Transmission Input Meters | 2 | | 2 | 4 |
| Transmission Meters | 14 | | 13 | 27 |
| ROU Boundary Meters | | 1 | 8 | 9 |
| Import Meters | 8 | | 2 | 10 |
| Source Meters | 153 | 13 | 21 | 187 |
| Export Meters | | | 4 | 4 |
| Irrigation meters | 5 | | | 5 |
| Animal watering meters | 2 | | | 2 |
| Tanker filling meters | 13 | 3 | 1 | 17 |
| Real losses meter | | | 1 | 1 |
| Total | 217 | 17 | 63 | 297 |

**Table 3-7 Inventory of NGWA Facilities (Number by Type and Status)**

| Type of Facility | Status | | | |
|---|---|---|---|---|
| | Active | Abandoned | Planned | Total |
| Wells | 172 | 41 | 11 | 224 |
| Reservoirs | 93 | 75 | | 168 |
| Pump or Booster Stations | 79 | 9 | | 88 |
| Tanker Filling Points | 22 | 3 | | 25 |
| Water Treatment Plants | 7 | 1 | | 8 |
| Aeration Towers | 5 | 1 | | 6 |
| WAJ Offices | 22 | 1 | | 23 |
| Storage Sites | 19 | 1 | | 20 |
| Laboratories | 7 | | | 7 |
| Maintenance Facilities | 14 | | | 14 |
| Housing | 16 | | | 16 |
| Buildings | 4 | 1 | | 5 |
| Total | 460 | 133 | 11 | 604 |

## Table 3-8 Number of Valves by ROU

### A. Number of Valves by ROU and Pipe Diameter

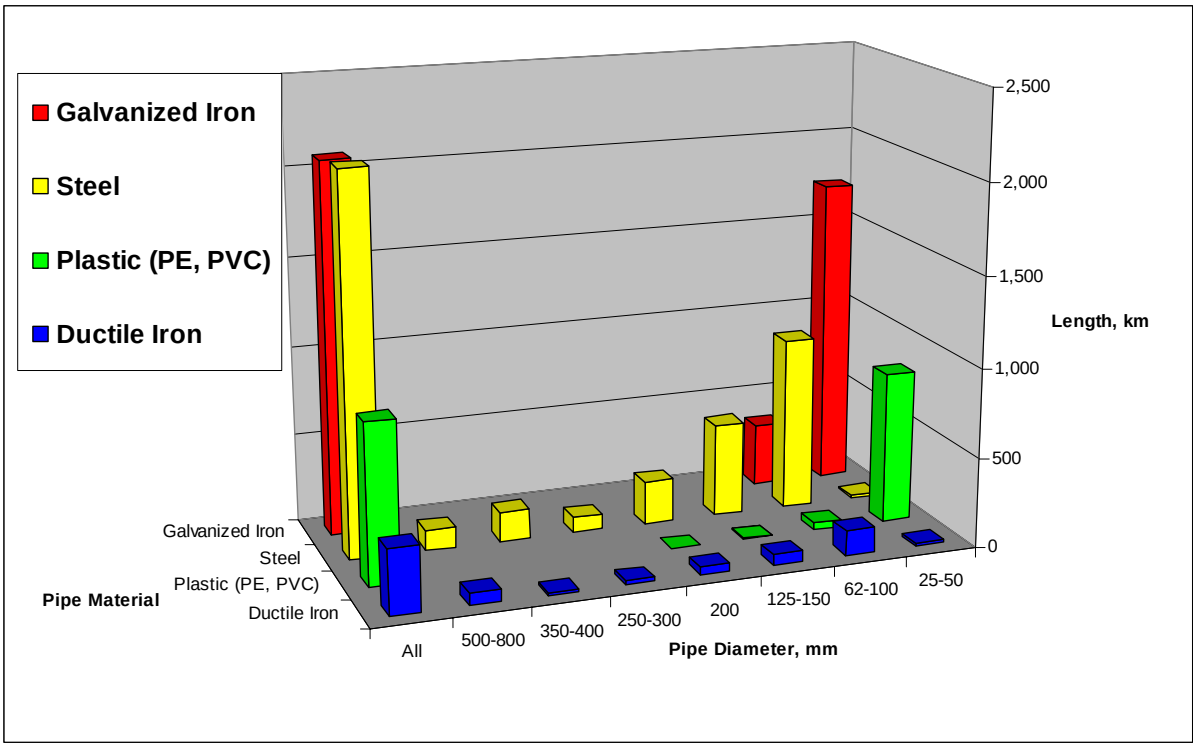
| ROU | Pipe Diameter, mm | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 50 | 62 | 75 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 800 | Unknown | Total |
| Ajloun | | 23 | | 23 | | 56 | | 10 | 2 | | | | 2 | | | | | 116 |
| Al Koura | 1 | 74 | | 4 | 1 | 44 | 1 | 22 | 10 | | | | | | | | 3 | 160 |
| Bani Kinana | | 80 | 8 | 25 | | 43 | | 14 | 5 | | 1 | | 1 | | | | 1 | 178 |
| Bani Ubaid | | 37 | | 18 | | 68 | | 12 | 9 | | 9 | 1 | 5 | | 2 | | | 161 |
| Irbid | | 529 | | 75 | 1 | 1,886 | | 264 | 64 | 15 | 60 | 2 | 60 | | 14 | 1 | 86 | 3,057 |
| Jerash | | 417 | | 37 | | 183 | | 37 | 22 | | 1 | | | | | | 37 | 734 |
| Mafraq | | 99 | | 2 | | 113 | | 46 | 10 | | 4 | | 15 | 2 | 8 | | 22 | 321 |
| North Badia | | 37 | | 5 | | 33 | | 24 | 42 | 2 | 2 | | 13 | | 1 | | 8 | 167 |
| North Shouneh | | | | | | 3 | | 8 | 1 | | 3 | | | | | | 14 | 29 |
| Ramtha | | 3 | | | | 5 | | 9 | 2 | | | | | | | | | 19 |
| Total | 1 | 1,299 | 8 | 189 | 2 | 2,434 | 1 | 446 | 167 | 17 | 80 | 3 | 96 | 2 | 25 | 1 | 171 | 4,942 |

### A. Cumulative Number of Valves, Percent of ROU Total

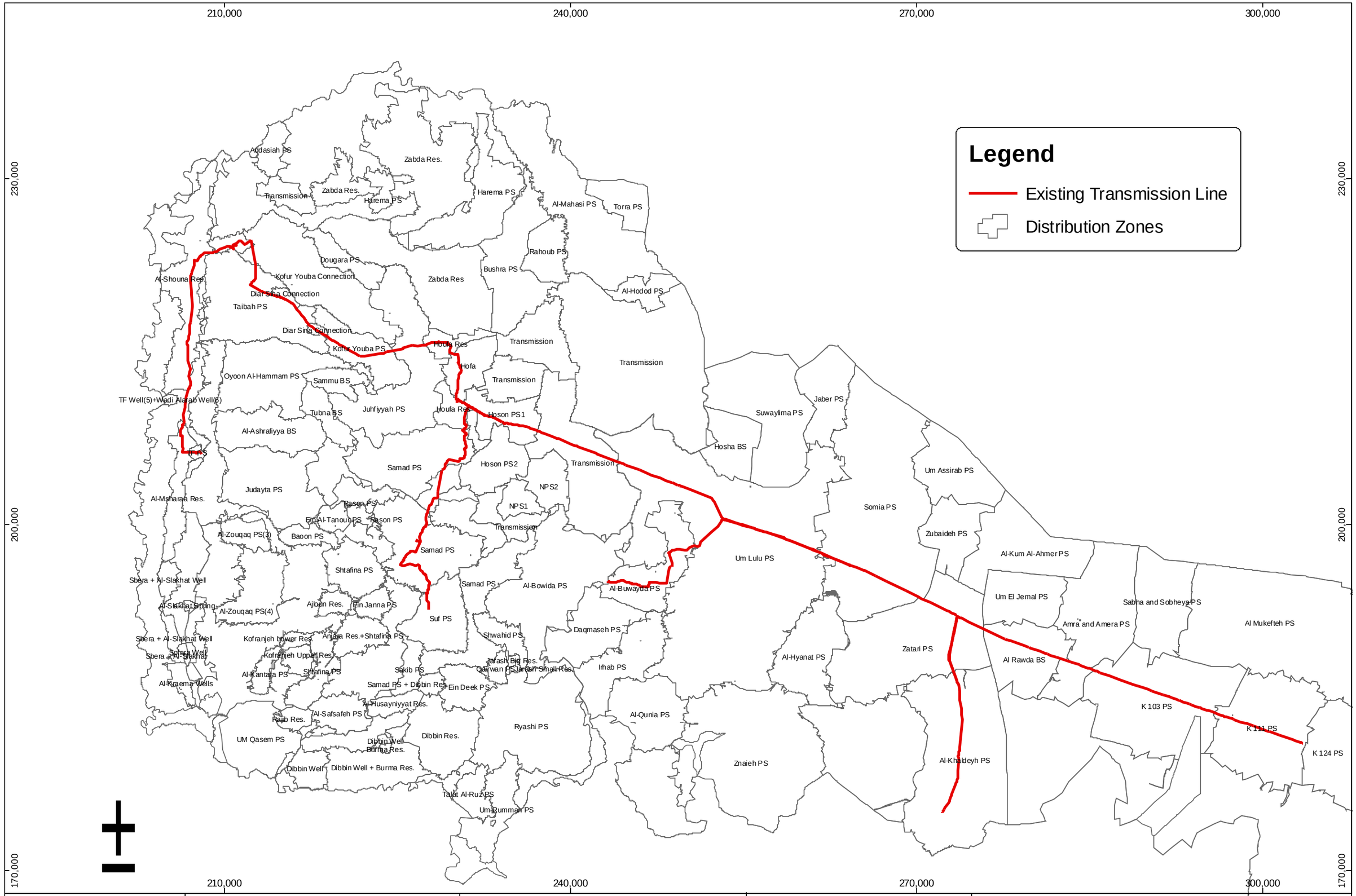
| ROU | Pipe Diameter, mm | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 50 | 62 | 75 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 800 | Unknown | Total |
| Ajloun | 0.0% | 19.8% | 19.8% | 39.7% | 39.7% | 87.9% | 87.9% | 96.6% | 98.3% | 98.3% | 98.3% | 98.3% | 100.0% | 100.0% | 100.0% | 100.0% | 100% | 100% |
| Al Koura | 0.6% | 46.9% | 46.9% | 49.4% | 50.0% | 77.5% | 78.1% | 91.9% | 98.1% | 98.1% | 98.1% | 98.1% | 98.1% | 98.1% | 98.1% | 98.1% | 100% | 100% |
| Bani Kinana | 0.0% | 44.9% | 49.4% | 63.5% | 63.5% | 87.6% | 87.6% | 95.5% | 98.3% | 98.3% | 98.9% | 98.9% | 99.4% | 99.4% | 99.4% | 99.4% | 100% | 100% |
| Bani Ubaid | 0.0% | 23.0% | 23.0% | 34.2% | 34.2% | 76.4% | 76.4% | 83.9% | 89.4% | 89.4% | 95.0% | 95.7% | 98.8% | 98.8% | 100.0% | 100.0% | 100% | 100% |
| Irbid | 0.0% | 17.3% | 17.3% | 19.8% | 19.8% | 81.5% | 81.5% | 90.1% | 92.2% | 92.7% | 94.7% | 94.7% | 96.7% | 96.7% | 97.2% | 97.2% | 100% | 100% |
| Jerash | 0.0% | 56.8% | 56.8% | 61.9% | 61.9% | 86.8% | 86.8% | 91.8% | 94.8% | 94.8% | 95.0% | 95.0% | 95.0% | 95.0% | 95.0% | 95.0% | 100% | 100% |
| Mafraq | 0.0% | 30.8% | 30.8% | 31.5% | 31.5% | 66.7% | 66.7% | 81.0% | 84.1% | 84.1% | 85.4% | 85.4% | 90.0% | 90.7% | 93.1% | 93.1% | 100% | 100% |
| North Badia | 0.0% | 22.2% | 22.2% | 25.1% | 25.1% | 44.9% | 44.9% | 59.3% | 84.4% | 85.6% | 86.8% | 86.8% | 94.6% | 94.6% | 95.2% | 95.2% | 100% | 100% |
| North Shouneh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 10.3% | 10.3% | 37.9% | 41.4% | 41.4% | 51.7% | 51.7% | 51.7% | 51.7% | 51.7% | 51.7% | 100% | 100% |
| Ramtha | 0.0% | 15.8% | 15.8% | 15.8% | 15.8% | 42.1% | 42.1% | 89.5% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100% | 100% |
| Total | 0.0% | 26.3% | 26.5% | 30.3% | 30.3% | 79.6% | 79.6% | 88.6% | 92.0% | 92.4% | 94.0% | 94.0% | 96.0% | 96.0% | 96.5% | 96.5% | 100% | 100% |

**Table 3-9 Number of Customers and Metered Use by ROU**

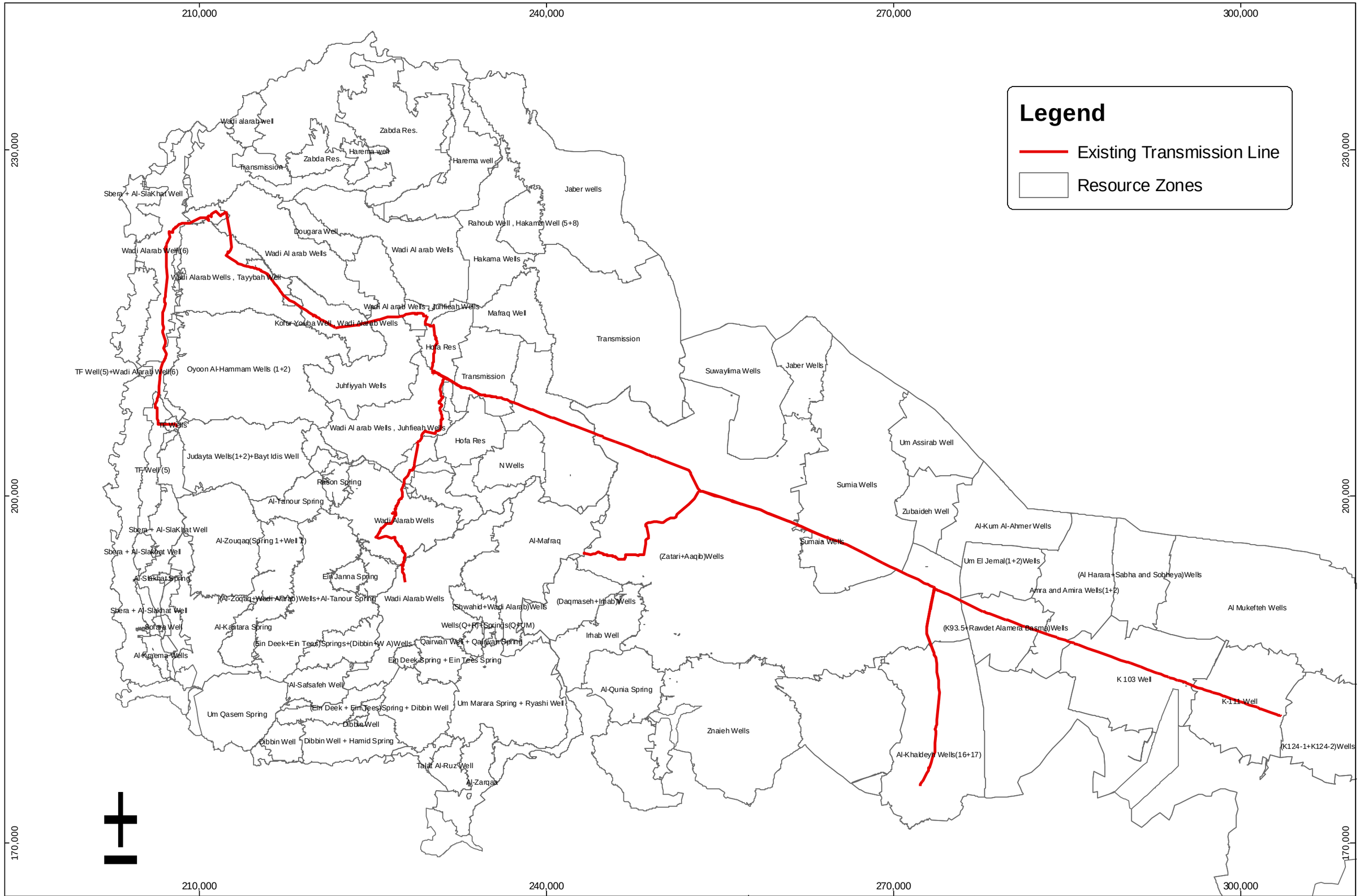
| Regional Operations Unit (ROU) | Quarterly Use m3 | Number of Customers | Daily Use per Customer, Liters |
|---|---|---|---|
| Ajlun | 508,669 | 13,471 | 420 |
| Al Koura | 355,360 | 10,281 | 384 |
| Badia | 295,960 | 6,821 | 482 |
| Bani Kinana | 368,868 | 9,812 | 418 |
| Bani Ubaid | 503,007 | 13,655 | 409 |
| Irbid | 1,966,718 | 68,043 | 321 |
| Jerash | 659,858 | 18,956 | 387 |
| Mafraq | 1,077,649 | 22,205 | 539 |
| Northern Shouna | 448,197 | 10,271 | 485 |
| Ramtha | 463,284 | 10,379 | 496 |
| Total | 6,184,287 | 183,894 | 374 |



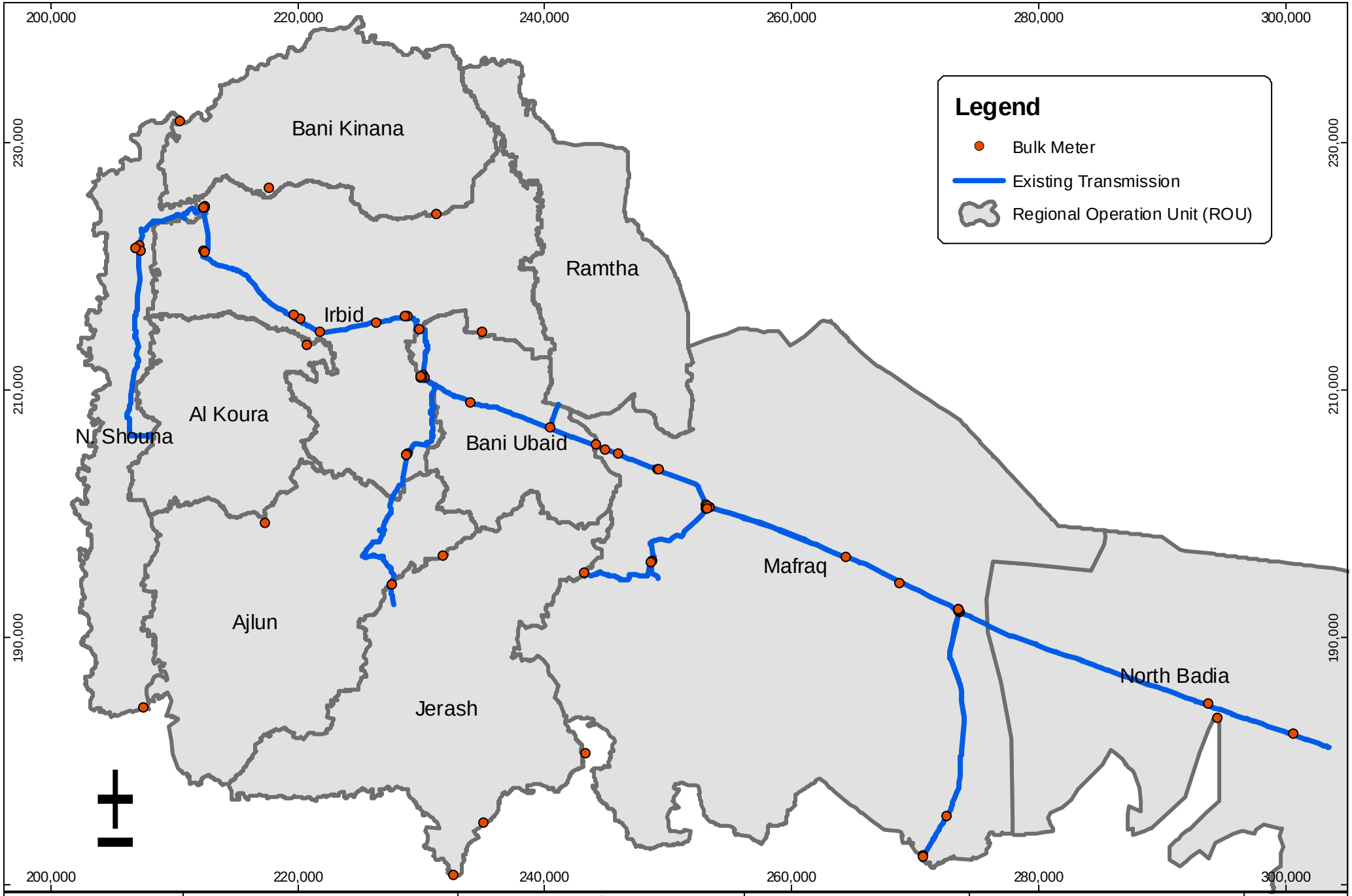

**NGWA Pipe Inventory by Diameter and Material**



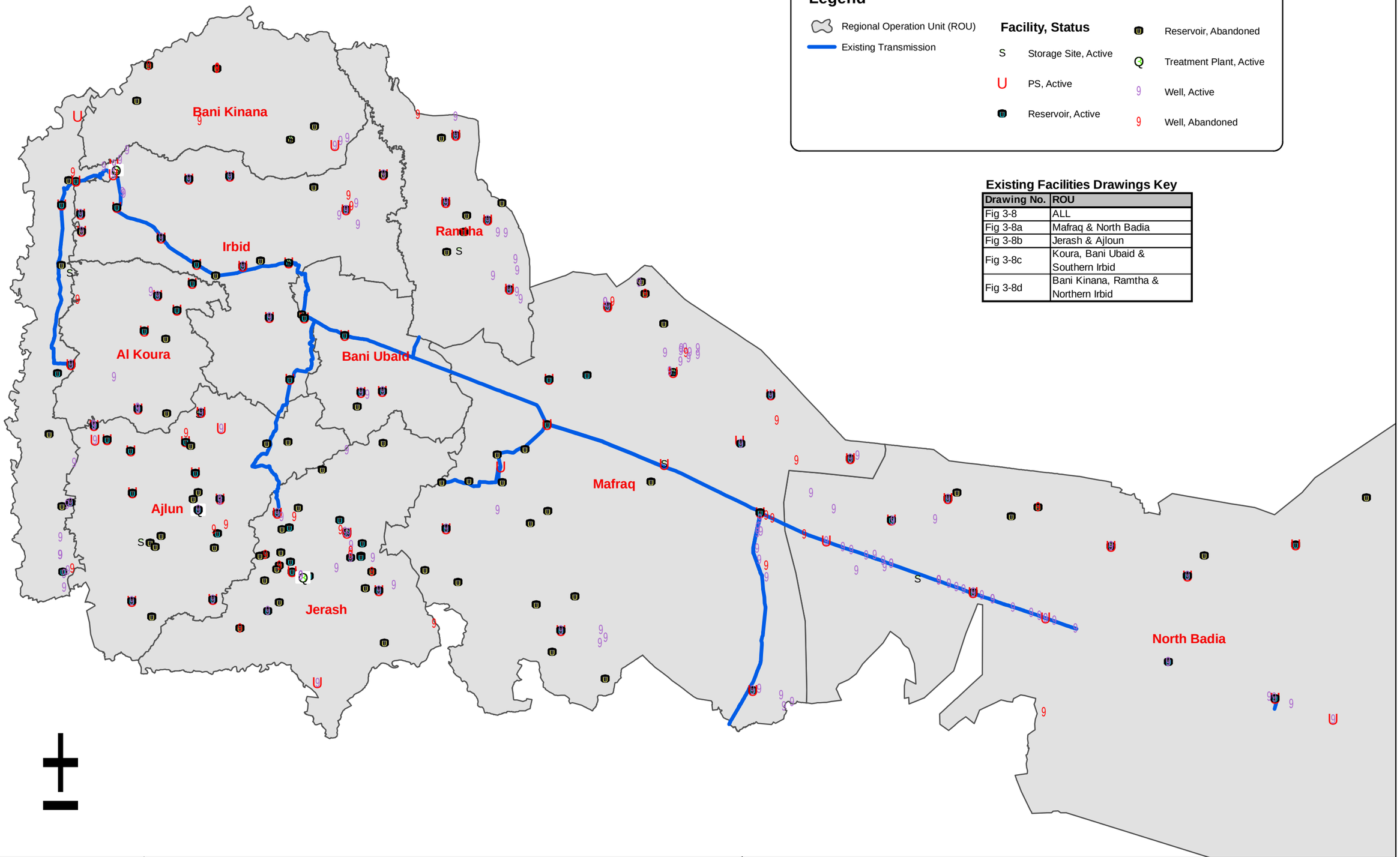

| | | | | |
|---|---|---|---|---|
| DRAWING SCALE: 1:300,000 | THE HASHEMITE KINGDOM OF JORDAN<br>MINISTRY OF WATER AND IRRIGATION<br>WATER AUTHORITY | CDM<br>CDM International Inc. | NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY | PROJECT No.<br>3029-42324 |
| | | | NGWA Distribution Zones | FIGURE No.<br>3-5 |




| | | | | | |
|---|---|---|---|---|---|
| DRAWING SCALE: 1:300,000 | THE HASHEMITE KINGDOM OF JORDAN<br>MINISTRY OF WATER AND IRRIGATION<br>WATER AUTHORITY | | CDM<br>CDM International Inc. | NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY | PROJECT No.<br>3029-42324 |
| | | | | NGWA Resource Zones | FIGURE No.<br>3-6 |




| | | | | | |
|---|---|---|---|---|---|
| DRAWING SCALE: 1:400,000 | THE HASHEMITE KINGDOM OF JORDAN<br>MINISTRY OF WATER AND IRRIGATION<br>WATER AUTHORITY | | CDM<br>CDM International Inc. | NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY<br>Locations of Bulk Meters at Transfer Points | PROJECT No. 3029-42324<br>FIGURE No. 3-7 |




**Existing Facilities Drawings Key**

| Drawing No. | ROU |
|---|---|
| Fig 3-8 | ALL |
| Fig 3-8a | Mafraq & North Badia |
| Fig 3-8b | Jerash & Ajloun |
| Fig 3-8c | Koura, Bani Ubaid & Southern Irbid |
| Fig 3-8d | Bani Kinana, Ramtha & Northern Irbid |

DRAWING SCALE

0 3.75 7.5 15 KM

THE HASHEMITE KINGDOM OF JORDAN
MINISTRY OF WATER AND IRRIGATION
WATER AUTHORITY

CDM
CDM International Inc.

NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY

Locations of NGWA Existing Facilities

PROJECT No. 3029-42324

FIGURE No. 3-8