

EXHIBIT A

From: brett@guamwaterworks.org
To: wfesteves@guamwaterworks.org; maurynm@guamwaterworks.org
Cc: [Garrett Yeoh](mailto:Garrett.Yeoh@guamwaterworks.org); vpangelinan@guamwaterworks.org
Subject: FW: Chaot Distribution Tracked Data
Date: Tuesday, May 16, 2023 1:58:17 PM
Attachments: [Leak Map.JPG](#)
[Tracked Chaot Data.xlsx](#)

Thanks Will. There is still significant water loss between Chaot and Well A-12 PRV. This water balance will need to be redone after the known leaks are fixed.

From: wfesteves@guamwaterworks.org <wfesteves@guamwaterworks.org>
Sent: Tuesday, May 16, 2023 1:35 PM
To: brett@guamwaterworks.org
Cc: garrett@guamwaterworks.org
Subject: Chaot Distribution Tracked Data

Hi Brett,

I have attached the current recorded flow data for the Chaot distribution line between Chaot and Deep Well A-12, and a leak map showing the location of all the leaks found on the line.

All of the orange symbols circled in green have been fixed since March and the orange symbols circled in red are still pending repair.

An initial leak (not on the leak map) was found near the Ordot Landfill at the end of 2022 and was fixed at the beginning of 2023.

Before the leak was fixed, there was a difference of **197** to **224** gpm between the outflow reading at Chaot and the reading at A-12. Only a small portion of this discrepancy was accounted for, as approximately 95 billed customers used about **15.58** gpm. Taking customer billing into account, there was still **181** to **208** gpm unaccounted for, with an average flowrate of **196** gpm unaccounted for between the dates 12/13/2022 – 12/29/2022. It should be noted that the meters were read once a day at various times of the day.

After the leak was fixed, there was a difference of **103** to **126** gpm unaccounted for between the dates 1/3/2023 – 1/18/2023, with an average flowrate of **116** gpm unaccounted for. Although this drop in unaccounted water shows that the leak was substantial, it should be noted that the meters were read once a day at various times of the day.

On 1/23/2023, data loggers were installed to the flow meters to record the flowrate data. Between the dates 1/24/2023 – 3/29/2023, there was a difference of **105** to **166** gpm unaccounted for, with an average flowrate of **138** gpm unaccounted for. The flowrate was recorded every 15 minutes, and the daily data point used in the tracked data is 9:30 AM.

Near the end of March, several points on the leak map were repaired. Between the dates 3/30/2023 – 5/10/23, there was a difference of **76** to **169** gpm unaccounted for, with an average flowrate of **89** gpm unaccounted for. The flowrate was recorded every 15 minutes, and the daily

data point used in the tracked data is 9:30 AM.

The amount of water unaccounted for has dropped significantly over the last several months; however there is still a large amount of unaccounted water lost within the distribution line. Once the last two leaks are repaired, we should see the amount of unaccounted water lost decrease again.

Please let me know if you have any questions or concerns.

Regards,

William Esteves

Associate Engineer

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Date	Time	Tank Unit Readings		Tank Outlet Readings		Customer use		A-23 Liquid Flowrate		Delta		
		gm	gal	gm	gal	gm	gal	gm	gal	gm	gal	
12/18/2022	afternoon	1144.66		1156.76		15.10		955.00		188.21		
12/18/2022	11:00 AM	1155.11		1167.21		12.10		955.00		188.21		
12/18/2022	4:30 PM	1166.92		1178.02		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/18/2022	11:30 PM	1179.26		1190.36		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/19/2022	12:00 AM	1191.58		1202.68		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/19/2022	6:00 AM	1203.90		1215.00		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/19/2022	11:31 AM	1216.22		1227.32		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/19/2022	4:15 AM	1228.54		1239.64		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/19/2022	11:31 PM	1240.86		1251.96		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/20/2022	11:31 AM	1253.18		1264.28		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/20/2022	4:00 PM	1265.50		1276.60		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/20/2022	11:31 PM	1277.82		1288.92		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/21/2022	11:31 AM	1290.14		1301.24		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/21/2022	4:00 PM	1302.46		1313.56		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/21/2022	11:31 PM	1314.78		1325.88		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/22/2022	11:31 AM	1327.10		1338.20		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/22/2022	4:00 PM	1339.42		1350.52		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/22/2022	11:31 PM	1351.74		1362.84		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/23/2022	11:31 AM	1364.06		1375.16		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/23/2022	4:00 PM	1376.38		1387.48		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/23/2022	11:31 PM	1388.70		1399.80		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/24/2022	11:31 AM	1401.02		1412.12		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/24/2022	4:00 PM	1413.34		1424.44		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/24/2022	11:31 PM	1425.66		1436.76		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/25/2022	11:31 AM	1437.98		1449.08		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/25/2022	4:00 PM	1450.30		1461.40		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/25/2022	11:31 PM	1462.62		1473.72		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/26/2022	11:31 AM	1474.94		1486.04		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/26/2022	4:00 PM	1487.26		1498.36		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/26/2022	11:31 PM	1499.58		1510.68		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/27/2022	11:31 AM	1511.90		1522.98		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/27/2022	4:00 PM	1524.22		1535.30		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/27/2022	11:31 PM	1536.54		1547.62		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/28/2022	11:31 AM	1548.86		1559.94		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/28/2022	4:00 PM	1561.18		1572.26		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/28/2022	11:31 PM	1573.50		1584.58		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/29/2022	11:31 AM	1585.82		1596.90		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/29/2022	4:00 PM	1598.14		1609.22		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/29/2022	11:31 PM	1610.46		1621.54		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/30/2022	11:31 AM	1622.78		1633.86		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/30/2022	4:00 PM	1635.10		1646.18		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/30/2022	11:31 PM	1647.42		1658.50		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/31/2022	11:31 AM	1659.74		1670.82		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/31/2022	4:00 PM	1672.06		1683.14		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
12/31/2022	11:31 PM	1684.38		1695.46		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/1/2023	11:31 AM	1696.70		1707.78		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/1/2023	4:00 PM	1709.02		1720.10		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/1/2023	11:31 PM	1721.34		1732.42		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/2/2023	11:31 AM	1733.66		1744.74		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/2/2023	4:00 PM	1745.98		1757.06		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/2/2023	11:31 PM	1758.30		1769.38		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/3/2023	11:31 AM	1770.62		1781.70		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/3/2023	4:00 PM	1782.94		1794.02		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/3/2023	11:31 PM	1795.26		1806.34		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/4/2023	11:31 AM	1807.58		1818.66		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/4/2023	4:00 PM	1819.90		1830.98		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/4/2023	11:31 PM	1832.22		1843.30		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/5/2023	11:31 AM	1844.54		1855.62		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/5/2023	4:00 PM	1856.86		1867.94		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/5/2023	11:31 PM	1869.18		1880.26		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/6/2023	11:31 AM	1881.50		1892.58		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/6/2023	4:00 PM	1893.82		1904.90		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/6/2023	11:31 PM	1906.14		1917.22		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/7/2023	11:31 AM	1918.46		1929.54		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/7/2023	4:00 PM	1930.78		1941.86		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/7/2023	11:31 PM	1943.10		1954.18		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/8/2023	11:31 AM	1955.42		1966.50		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/8/2023	4:00 PM	1967.74		1978.82		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/8/2023	11:31 PM	1980.06		1991.14		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/9/2023	11:31 AM	1992.38		2003.46		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/9/2023	4:00 PM	2004.70		2015.78		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/9/2023	11:31 PM	2017.02		2028.10		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/10/2023	11:31 AM	2029.34		2040.42		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/10/2023	4:00 PM	2041.66		2052.74		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading
1/10/2023	11:31 PM	2053.98		2065.06		11.10		955.00		188.21		8 Minute Difference in Outlet Reading and PV Reading

Min Max between 1/24 and 1/25: 105.1387
Max: 166.545

Min Max between 1/20 and 1/21: 76.2325
Max: 169.7325

Average Delta between 1/23 and 1/23: 156.313133

Average Delta between 1/21 and 1/21: 115.8725

Average Delta between 1/24 and 1/24: 138.1012492

Average Delta between 1/20 and 1/20: 88.8751714