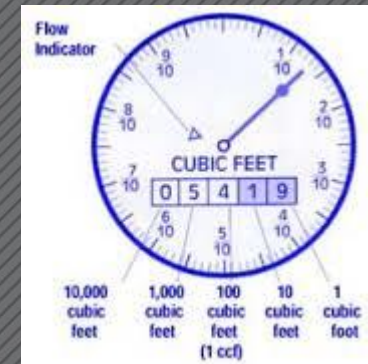


Tualatin Valley Water District



TVWD Meter Operations



Improving Meter Operations
with Cityworks and GIS



ESRI Water Conference
February 10, 2015

Introductions

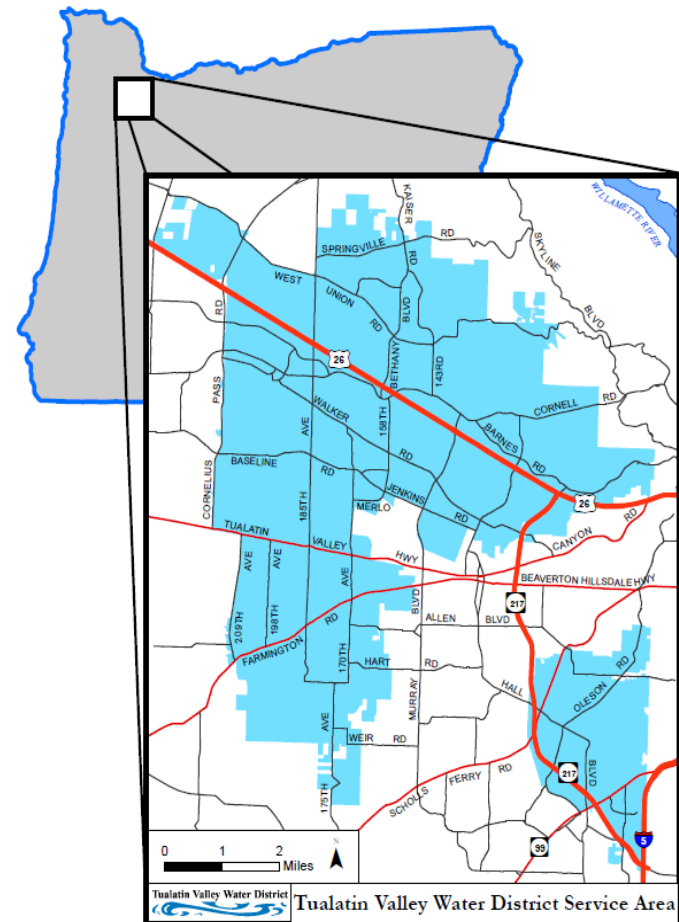
POWER

Bill Hoisington –

Senior Cityworks Consultant

TVWD Introduction

- Second largest water supplier in Oregon
- 200,000 customers
- 44-square-mile service area
- 60,000 service connections
- Owns and operates its own water distribution infrastructure
- Provides maintenance, meter reading and billing services for neighboring utilities.
- The district is governed by a five-member Board of Commissioners elected at large to four-year terms by the district's voters.



TVWD Project Outline

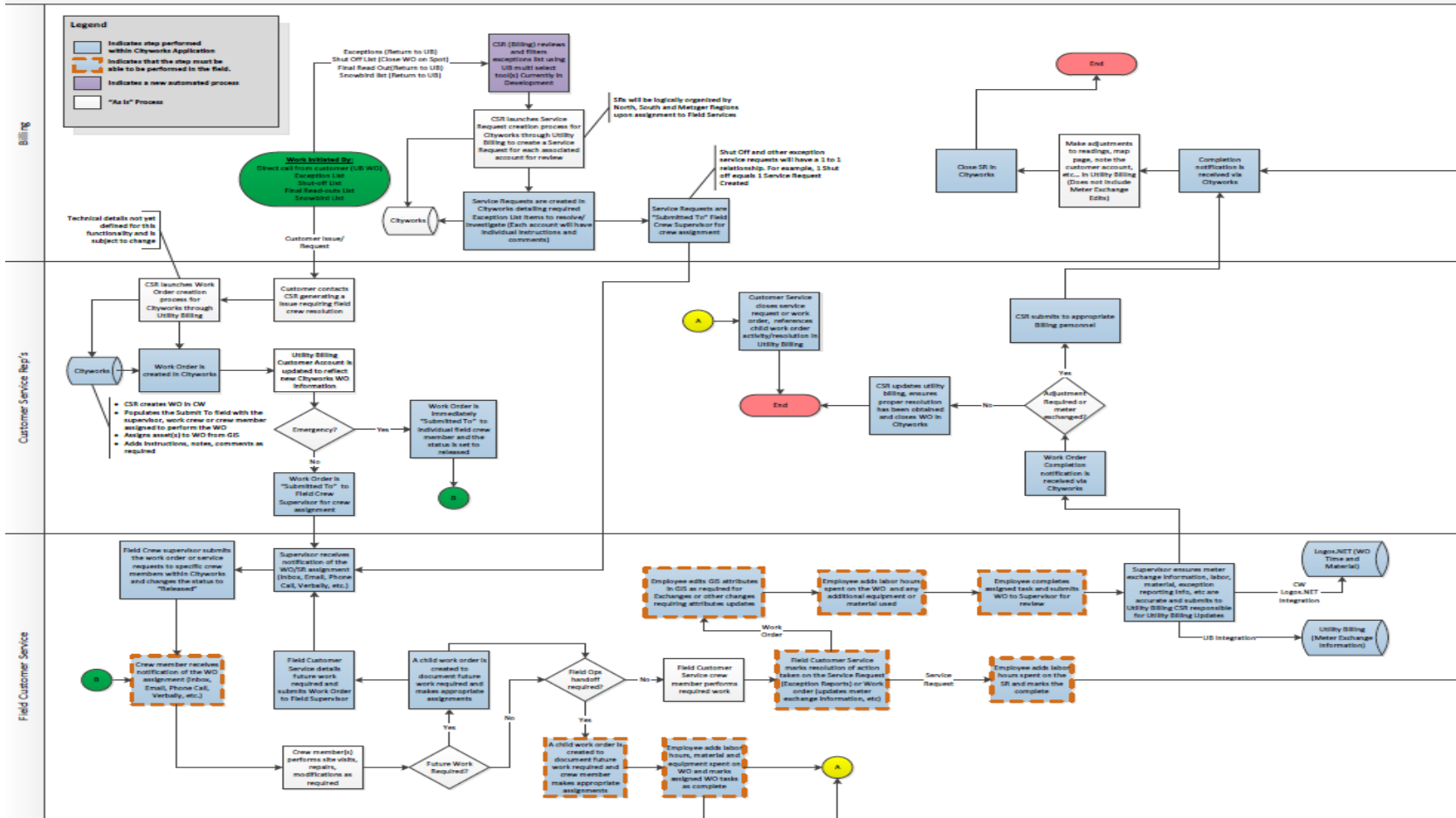
- Cityworks will be deployed to core TVWD operations
- 3 Year Project
 - Planning
 - Business Process Review
 - Development
 - Deployment
- Metering project part of a overall Cityworks deployment
- Metering was the 1st work flow to go live

TVWD Metering Project Goals

- Integrate business processes across the Automated Meter Reading (AMR) program (consumption, conservation, loss/leak control), utility billing (meter-to-cash),
- Integrate GIS-centric asset management (infrastructure operations and maintenance, meeting customer service levels).
- Leverage inter-relationship of these processes for efficient and sustainable water utility management.

TVWD Metering Operations

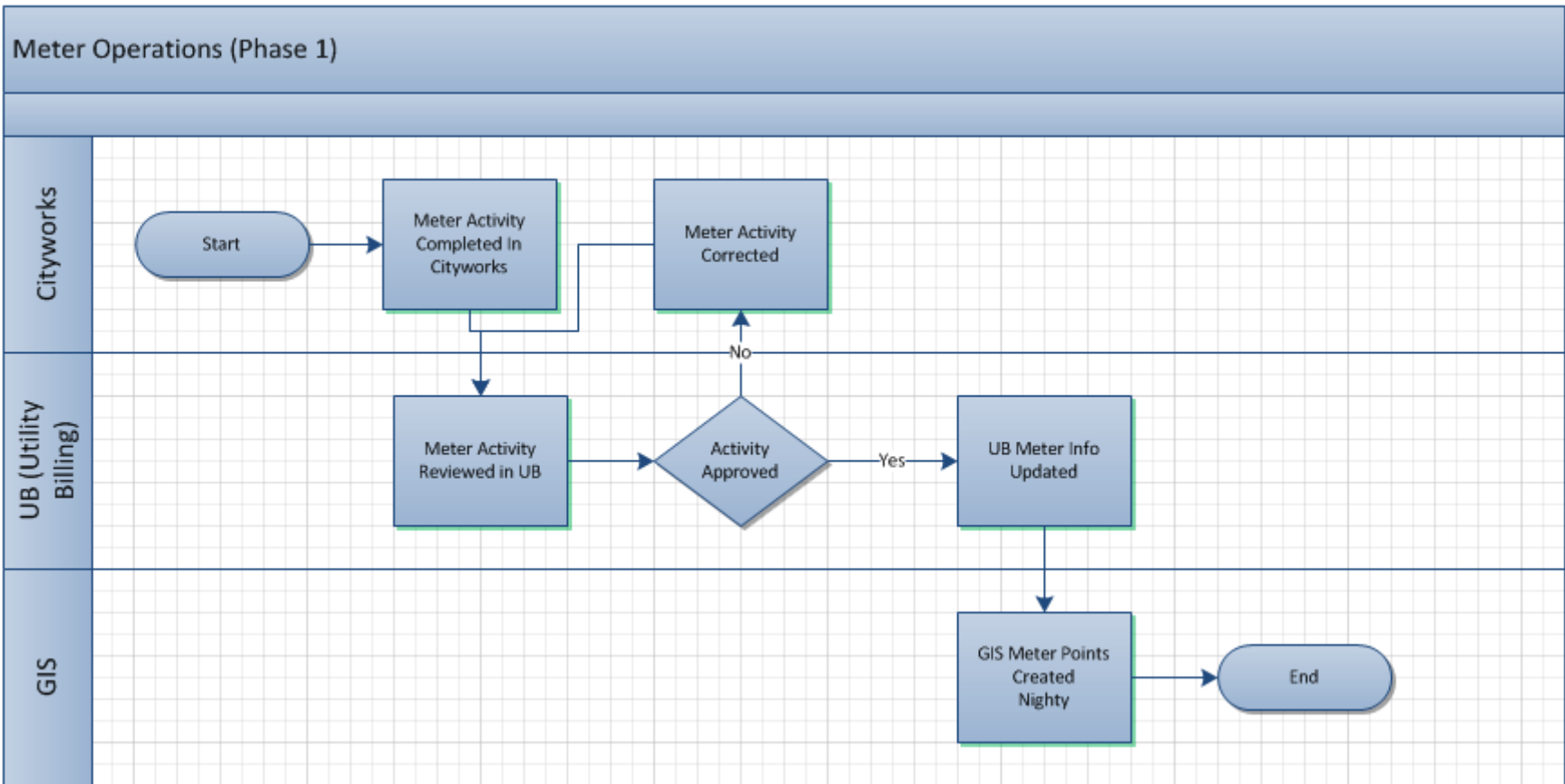
"To Be" Small Meter Repair, Replace, Modify, Exchange, Relocate Workflows: 23, 24



TVWD Metering Operations

- **4 Metering Work Flows**
 - Meter Install
 - Meter Exchange
 - Meter Removal
 - Meter Corrections

TVWD Metering Operations (Phase 1)



TVWD Metering Cards

Tualatin Valley Water District

Meter Card

| | |
|--|------------------------|
| Acct #: | C.C.: |
| Service #: | Receipt#: 21792 |
| Route & Seg. #: | N&A ID #: |
| Site Address: 8663 SW 176TH AVE | Zip Code: 97007 |
| Name: Del Boca Vista, LLC | Meter #: 43477752 |
| Address: P.O. Box 486 | Meter Type: Badger |
| CSZ: Newberg, OR 97132 | Meter Size: 3/4" Meter |
| Phone #: 503-590-8600 | No. Digits: 4 |
| Sub & Lot #: SUNRISE HEIGHTS - Lot #11 | Start Read: 0x4 |
| Meter Location: | PSI: #68 |
| Date Printed: 3/13/2014 | Regulator: |
| Date Paid: 3/13/2014 | Inv. Used: 3/4" spud |
| Date Installed: 3/26/14 | Installed By: me |

~~Meter #123456789 installed by DONN~~

METER EXCHANGE

ACCT. NO. 2555

BOOK-PAGE _____

DATE 3-25-14

NAME _____

ADDRESS 12585 NW COLMAN DR

TELEPHONE _____

OLD METER NO. 97671038

OLD READING 1959

NEW METER NO. 85541443

SIZE 5/8" MFG. BADGER

NEW READ 0x4

DATE REPAIRED 3-25-14

BY MB/MP

FINDINGS (1) 5/8" AMR

(1) BROOKS 4 LID W/ HOLE

CUSTOMER

SERVICE

MAR 27 2014



85541443

88888888

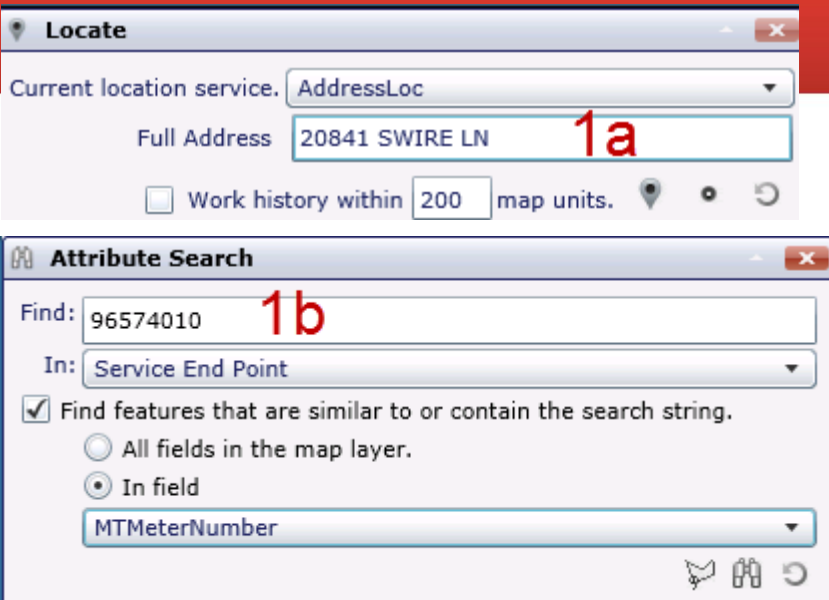
ENTERED

MAR 25 2014

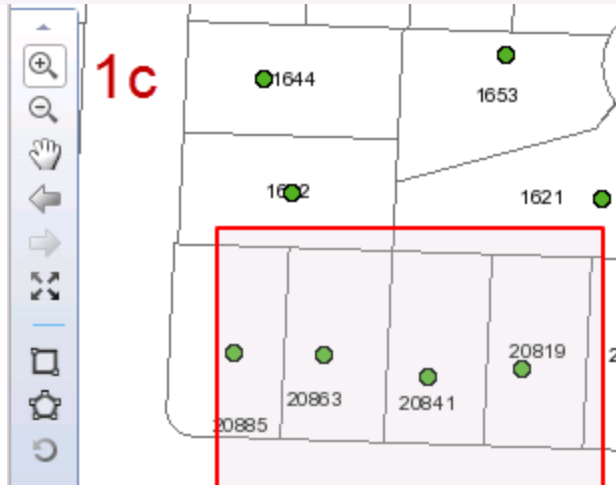
TVWD Meter Work Flow (Field Crew)

- 1) Find Meter Point on the Cityworks Maps
- 2) Select the Metering Point
- 3) Create the Inspection
- 4) Populate and Close Inspection
- 5) Repeat

Inspection – Work Flow

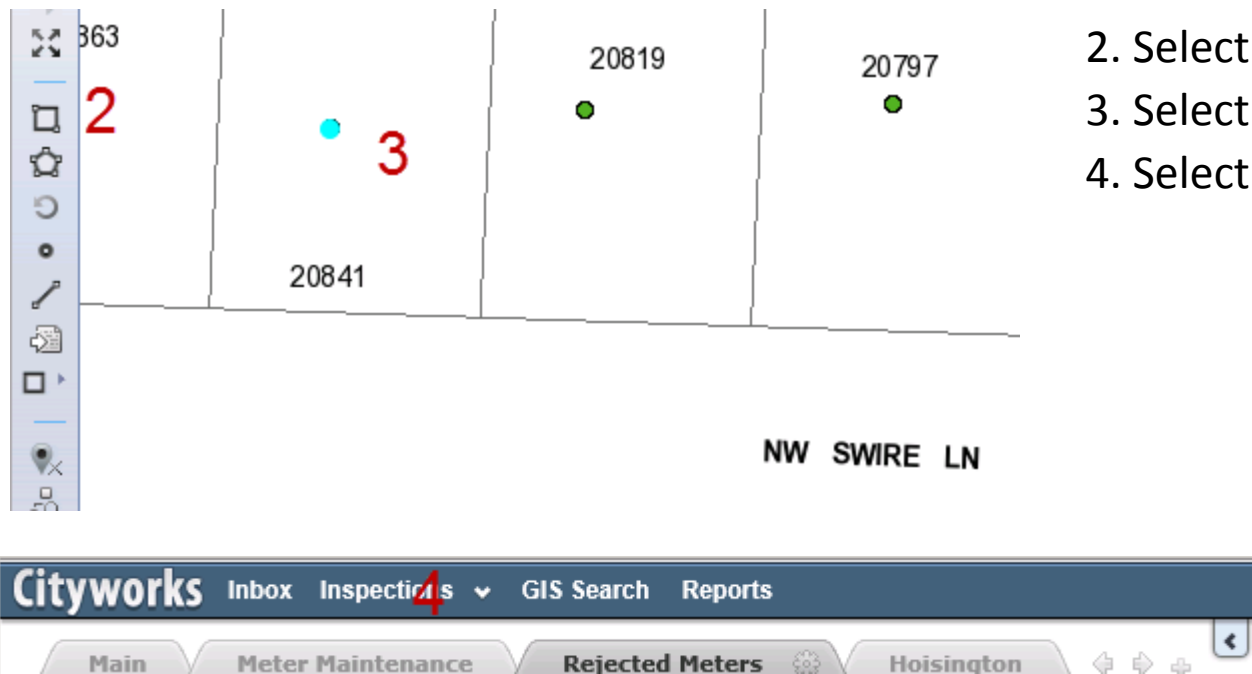


1. Navigate to Service End Point
 - a. Locate by Address
 - b. Locate by Attribute
 - c. Navigation Tools



Inspection – Work Flow

2. Select Selection Tool
3. Select Service End Point
4. Select Inspection Menu



Inspection – Work Flow

6

Create an Inspection

Entity Group: Water

Apply To Entity

Feature Service End Point

Object

Other

Template

METER_CORRECTION

METER_EXCHANGE

METER_INSTALL 5

METER_REMOVAL

6

Currently Selected Assets

| <input checked="" type="checkbox"/> | Type | Id | Legacy Id | Location |
|-------------------------------------|------------------|---------|-----------|-------------------|
| <input checked="" type="checkbox"/> | WSERVICEENDPOINT | SE38025 | | 20841 NW SWIRE LN |

5. Select Inspection Template
6. Select Create

TVWD Metering Forms (Install)

Inspection

Comments

Id: 632

Address: 20841 NW SWIRE LN

Status: Open

Register #1

R1 Install Date: 4/15/2014

R1 DeviceID: 1231

R1 New Read: 0000

R1 Make Model: 35

R1 Register Type: Large

R1 Number of Digits: 4

Meter Install

Meter Make Model: Badger

Meter Install Date: 4/28/2014

No: No

5/8"

TVWD Metering Forms (Exchange)

Inspection

Comments

Id: 634

Address: 20863 NW SWIRE LN

Register #1

R1 Install Date: 4/25/2014

Old R1 Final Read: 5434

R1 Register Number: 43434343

R1 New Read: 0

R1 Make Model: 25

R1 Register Type: Large

R1 Number of Digits: 4

Meter Exchange

What is the reason for the exchange?

AMP

Badger

4/28/2014

No

5/8"

TVWD Metering Forms (Removal)



Inspection

Comments



Id: 633

Address:


Status: Open

Insp. Date: 4/23/2014 1:43 PM ¹  Inspected By: HOISINGTON, BILL ² 


Type: METER_REMOVAL


Submit To:  Date: 

Meter Removal

R1 Final Read 

12345

R2 Final Read 

R3 Final Read 

UB Verification

- **UB = Utility Billing**
 - (TVWD Developed App)
- Authoritative source of meter information
- Custom form reads completed inspections from Cityworks Open Meter Inspection InBox (Cityworks API)
- Clerk verifies Cityworks meter info is valid
 - Readings

UB Change List Form

Meter Change List

Unprocessed Meter Change List

| Insp. ID | Unique ID | Type | Meter Location | Inspection Date | Closed Date | Cycle Status |
|----------|-----------|------------------|-------------------------|---------------------|---------------------|--------------|
| 3578 | SE53315 | METER_CORRECTION | 5699 NW BANNISTER DR | 2015-01-28T13:42:00 | 2015-01-28T13:45:07 | BILLED |
| 3612 | SE125365 | METER_INSTALL | 2181 SW UPTON TER | 2015-01-15T06:15:00 | 2015-01-29T06:16:41 | |
| 3618 | SE146399 | METER_INSTALL | 16939 NW LYNCH LN | 2015-01-29T14:25:00 | 2015-01-29T14:26:59 | |
| 3619 | SE146398 | METER_INSTALL | 16961 NW LYNCH LN | 2015-01-29T14:27:00 | 2015-01-29T14:28:53 | |
| 3620 | SE133476 | METER_INSTALL | 6999 NW 170TH AVE | 2015-01-29T14:29:00 | 2015-01-29T14:30:24 | |
| 3629 | SE147200 | METER_INSTALL | 0002 ABBEY HEIGHTS | 2015-01-29T15:33:00 | 2015-01-29T15:34:30 | |
| 3630 | SE147199 | METER_INSTALL | 0000 ABBEY HEIGHTS | 2015-01-29T15:34:00 | 2015-01-29T15:36:10 | |
| 3631 | SE147198 | METER_INSTALL | 0001 ABBEY HEIGHTS | 2015-01-29T15:36:00 | 2015-01-29T15:37:23 | |
| 3632 | SE139972 | METER_INSTALL | 18828 NW PARK RIDGE WAY | 2015-01-29T15:41:00 | 2015-01-29T15:42:31 | |
| 3633 | SE16708 | METER_EXCHANGE | 21540 SW LOIS ST | 2015-01-29T15:46:00 | 2015-01-29T15:47:45 | UPLOAD |
| 3639 | SE146814 | METER_INSTALL | 17756 SW JOHNSON ST | 2015-01-30T15:39:00 | 2015-01-30T15:40:52 | |
| 3640 | SE147998 | METER_INSTALL | 7933 SW FRAMMY WAY | 2015-01-30T15:45:00 | 2015-01-30T15:46:11 | |
| 3641 | SE147999 | METER_INSTALL | 7921 SW FRAMMY WAY | 2015-01-30T15:47:00 | 2015-01-30T15:48:02 | |
| 3644 | SE5782 | METER_EXCHANGE | 21317 SW ROCK RD | 2015-01-30T15:55:00 | 2015-01-30T15:56:46 | UPLOAD |
| 3645 | SE15592 | METER_EXCHANGE | 1495 SW 211TH AVE | 2015-01-30T15:59:00 | 2015-01-30T15:59:55 | UPLOAD |

35 Result(s) Found

Refresh Close

UB Verification Form

UB Meter Change

Inspection: 3578
 Inspection Type: **METER_CORRECTION** UID: SE53315 Site ID: 81547
 Subdivision: _____ Lot: _____
 Customer: _____ [Insert To UB](#)

Current Meter **Old Meter**

Meter Detail
 Make Model: Badger Install Date: 1/ 1/1900 Meter NO.: 32642482
 Meter Size: 5/8" Is Locked Is Radio
 Location: _____
 Comment: _____

Register Detail
 How you want to insert the read: 1. Update Current Read

Register 1
 Radio Device ID: 32642482 Type: Large Num. of Digits: 4 Current Read: 1709
 Make Model: 25 Install Date: 1/ 1/1900

Register 2
 Radio Device ID: _____ Type: _____ Num. of Digits: _____ Current Read: _____
 Make Model: _____ Install Date: 1/ 1/1900

Register 3
 Radio Device ID: _____ Type: _____ Num. of Digits: _____ Current Read: _____
 Make Model: _____ Install Date: 1/ 1/1900

[Reject](#) [Approve](#)

Deny Reason: _____ Inspected By: ETIENNE, MIKE [Close](#)

Site #81547

Site Info. | Site Note | Work Order | **Water** | Sewer | SW/M

Site Service Information:
 Installed: 08/08/2005 Status: On Class Code: Residential

Meter Information:
 Manufacturer: BADGER Meter Size: 5/8" Meter #: 32642
 Location: _____
 Route NO.: 4 Sequence: 401234 Is Locked: Is Radio: SDC#: _____ Find

| Register NO. | Register Type | NO. Digits | Rad. Dev. ID | M.M. | Installed On |
|--------------|---------------|------------|--------------|------|--------------|
| 1 | Large | 4 | | | 1/1/1900 |

Readings:
 Read Date : 12/26/2014 (1 item) Consumption Sum = 13
 Read Date : 10/27/2014 (1 item) Consumption Sum = 31
 Read Date : 08/25/2014 (1 item) Consumption Sum = 48

Page 1 of 1 [<<Prev](#) [Next>>](#) [Add](#) [Edit](#) [Cancel](#) [Save](#)

Cityworks Work Process

- If valid, meter info is updated in UB and inspection is posted
- If invalid, inspection is rejected and returned to supervisor's Cityworks Reject Inbox for correction

The screenshot displays the 'FCS Inspections' interface with three main sections:

- Open Meter Inspections (4 records):** A table listing active inspections with columns for Id, Address, Inspection Type, Date Inspected, Inspected By, Status, and Submit T.
- Closed Meter Inspections (Last 7 Days):** A table with columns for Id, Address, Initiated By, Initiated Date, Inspection Type, Date Inspected, and Ins. It currently shows 'No records to display.'
- Rejected Meter Inspections (6 records):** A table listing rejected inspections with columns for Id, Address, Initiated By, Initiated Date, Inspection Type, Date Inspected, and Ins.

| Id | Address | Inspection Type | Date Inspected | Inspected By | Status | Submit T |
|----------------------|-------------------------|------------------|---------------------|--------------|--------|----------|
| 2545 | 18890 NW AVERY PARK WAY | METER_INSTALL | 12/19/2014 10:51 AM | | | |
| 2629 | 18852 NW PARK RIDGE WAY | METER_INSTALL | 12/22/2014 2:10 PM | | | |
| 2696 | 18920 NW PARK RIDGE WAY | METER_EXCHANGE | 12/23/2014 3:06 PM | | | |
| 2843 | 1051 NW KATSULES PL | METER_CORRECTION | 2/4/2015 2:42 PM | | | |

| Id | Address | Initiated By | Initiated Date | Inspection Type | Date Inspected | Ins |
|------------------------|---------|--------------|----------------|-----------------|----------------|-----|
| No records to display. | | | | | | |

| Id | Address | Initiated By | Initiated Date | Inspection Type | Date Inspected | Ins |
|----------------------|-------------------|-----------------|-----------------------|-----------------|----------------|-----|
| 2078 | 2088 SW 187TH AVE | WILLIAMS, BROCK | 12/2/2014 3:26:09 PM | | | |
| 2109 | 0000 SE 78TH AVE | JOHNSON, CHRIS | 12/8/2014 8:59:42 AM | | | |
| 2110 | 0000 SW FRAMMY LN | JOHNSON, CHRIS | 12/8/2014 9:09:22 AM | | | |
| 2257 | 8826 SW SDRUCE ST | WILLIAMS, BROCK | 12/16/2014 3:20:41 PM | | | |

TVWD System Architecture

- Cityworks Server 2013
- ArcGIS Server 10.1
- Firefox published using Citrix
- ATT 4G Connections
- Touch Screen Field Laptops

System Benefits

| Inefficient Processes Before Cityworks | Optimized Work Processes and Revenue Stream |
|--|--|
| Many paper forms and lists. 2–3 hours/day to organize work. | Automated process to enter meter installations and exchanges into Utility Billing using Cityworks. Reduced number of errors and unknowns coming back from the field. |
| Manually maintained meter information resulted in some redundancies. | More efficient flow of information with no duplicate data entry. |
| Meters not in the GIS; no geographic location. | Service points and meter information in GIS provide the ability to perform analysis on consumption by meter location and infrastructure supplying the meter. Streamlined AMR replacement project using GIS-based meter reports. |
| Multiple entries and checking information from the field. | More efficient customer service workload. |

System Benefits - End Users

“So far, the process has been promising, And having meter install and exchange information at our fingertips has been helpful. I look forward to TVWD’s future use of Cityworks so we can automate even more of our processes to increase productivity.”

Chris Johnson,
Field Customer Service supervisor

“Cityworks allows us to better monitor situations that in the past would have required more time and research.”

“New meter data entered by field crews on-site makes tracking installations significantly easier and prevents duplication of entries”

Brenda Lennox,
Manager of Customer Support Services

System Benefits - End Users

“Having meter exchanges automatically uploaded to the Utility Billing system helps us avoid manual entry mistakes and has definitely made our process faster.”

Kathy Gannet

Customer Service and Billing supervisor

Project Phases

- **Expansion to other TVWD Departments**
 - Field Operations
 - Distribution
 - Construction
 - Engineering
 - Valve Crews
 - Water Quality
 - Building and Grounds
 - Fleet
- **Interfaces**
 - Projects
 - Employees
 - Materials
 - Time
 - SCADA
 - Fuel System
 - iWater

Questions?

