

GIS FOR MANAGING WATER PROJECT LIFE CYCLE NOTIFICATIONS

Gordon Robertson

Rochester Public Utilities

THE PROBLEM

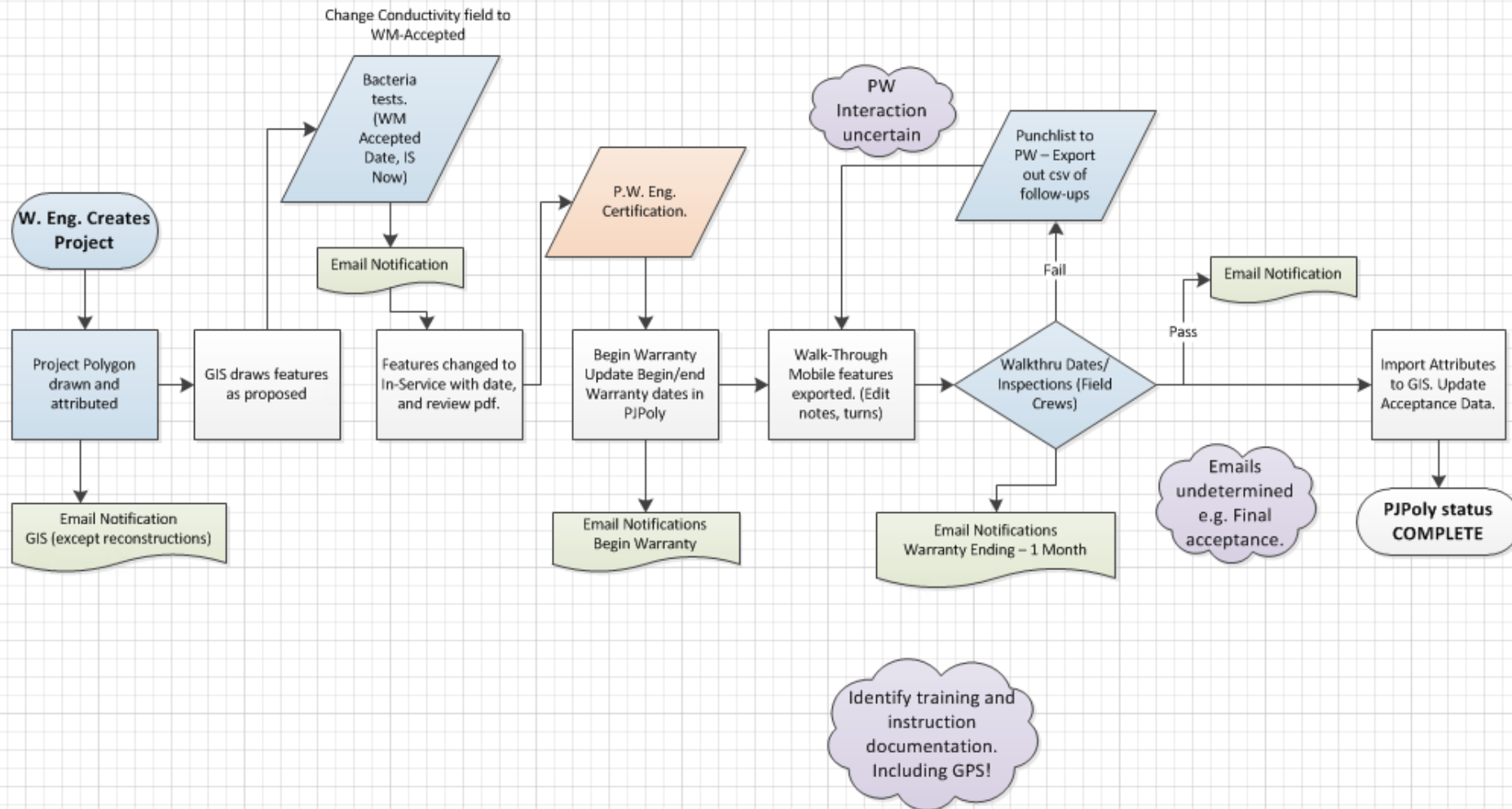
- Lots-of-paper based workflows.
- Duplications of data and many hands.
- Difficulty with data visibility.
- Staff turnover and position changes in Public Works and RPU.
- Field inspections being missed and warranties expiring.

WORKFLOW ANALYSIS

- Met with Engineering, Water Work Planner and Manager, and Public Works Inspector.
- Created a new proposed workflow in GIS with email notifications using Geoevent.

Water Construction Projects

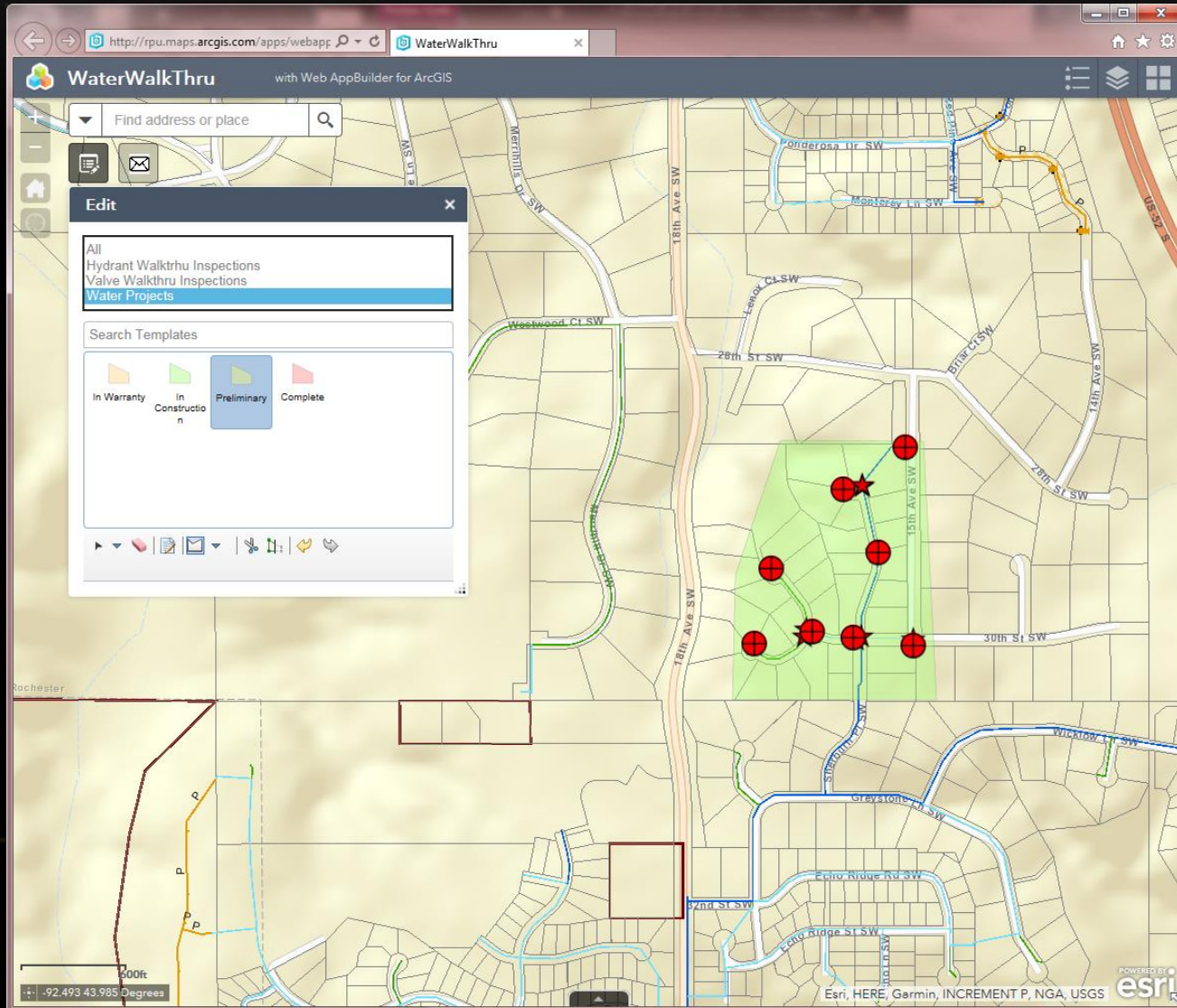
Proposed workflow



WEB APPLICATION AND SEPARATE GIS DB

- Mobile database created in SDE instance
- Non-versioned editing of published as Service on ArcGIS Online account.
- WebAppBuilder used with widgets. Office desktop browsers and field iPads.

CREATE PROJECT POLYGON



GEOEVENT NOTIFICATIONS

Processing of Project Polygon in GeoEvent for Server. Last edit date is tag, date no change.

ArcGIS GeoEvent Manager

Cluster - default | Help | Sign Out

Services Site Logs

Monitor Inputs **GeoEvent Services** Outputs

WaterProject_Notifications

Service used to poll water project polygons and send out notifications when certain criteria met.

Publish Back

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,840	0 /sec	6 /sec	14 Days, 00:38:07	
	Out	0	0 /sec	0 /sec	26 Days, 20:06:14	

Layout

New Elements

Filter

Processor

Inputs

RCSMS XML

WaterProjectInput

NetworkfleetInput

Outputs

RiverDepth_Verizon

River Height

WaterProjects_Out

WaterProj_WMAcceptEmail

WaterProj_FinalWalkThruEmail

NWF_GPS

NWF_DIAGNOSTIC

WaterProj_WalkThruEmail

WaterProj_BeginWarrantyEmail

RiverDepth_Sprint

WaterProj_StartDateEmail

WaterProjectInput

ProjectStartDate

WM Accepted

WaterProj_StartDateEmail

WaterProj_WMAcceptEmail

GeoEventFlag_Add

WaterProjects_Out

WaterProj_BeginWarrantyEmail

WaterProj_WalkThruEmail

WaterProj_FinalWalkThruEmail

ArcGIS Server Connection: rpugisweb

Folder: /

Service Name: WaterProjects

Layer: 0

Create GeoEvent Definition: true

GeoEvent Definition Name (New): WaterProjects

Refresh Interval: 10

Get Incremental Updates: true

Method to Identify Incremental Updates: Timestamp

Time Field to Identify Incremental Updates: last_edited_date

Advanced



Monitor

Inputs

GeoEvent Services

Outputs

WaterProjectInput (Poll an ArcGIS Server for Features)

[Save](#) [Cancel](#)

Name*:

ArcGIS Server Connection*:

[Register ArcGIS Server](#)

Folder:

Service Name*:

Layer:

Create GeoEvent Definition*:

☒ Yes ☐ No

GeoEvent Definition Name (New)*:

Refresh Interval:

Get Incremental Updates*:

☒ Yes ☐ No

Method to Identify Incremental Updates:

Time Field to Identify Incremental Updates:

[▶ Advanced](#)

GEOEVENT FILTER

ArcGIS GeoEvent Manager

Cluster - default | Help | Sign Out

Services Site Logs

Monitor Inputs **GeoEvent Services** Outputs

WaterProject_Notifications

Service used to poll water project polygons and send out notifications when certain criteria met.

Publish Back

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,840	0 /sec	6 /sec	14 Days, 00:37:35	
	Out	0	0 /sec	0 /sec	26 Days, 20:05:42	

Layout

- Filter
- Processor

New Elements

Filter

Processor

Inputs

- RCSMS XML
- WaterProjectInput
- NetworkfleetInput

Outputs

- RiverDepth_Verizon
- River Height
- WaterProjects_Out
- WaterProj_WMAcceptEmail
- WaterProj_FinalWalkThruEmail
- NWF_GPS
- NWF_DIAGNOSTIC
- WaterProj_WalkThruEmail
- WaterProj_BeginWarrantyEmail
- RiverDepth_Sprint
- WaterProj_StartDateEmail

Flowchart:

```
graph LR; Input[WaterProjectInput] --> Filter[ProjectStartDate - Filter condition(s)]; Input --> WarrantyStart{WarrantyStart}; Input --> InitialWalkThru{InitialWalkThru}; Input --> FinalWalkThru{FinalWalkThru}; Filter --> WaterProj_StartDateEmail[WaterProj_StartDateEmail]; Filter --> GeoEventFlag_Add[GeoEventFlag_Add]; WarrantyStart --> WaterProj_WMAcceptEmail[WaterProj_WMAcceptEmail]; InitialWalkThru --> WaterProj_WalkThruEmail[WaterProj_WalkThruEmail]; FinalWalkThru --> WaterProj_FinalWalkThruEmail[WaterProj_FinalWalkThruEmail]; GeoEventFlag_Add --> WaterProjects_Out[WaterProjects_Out];
```

ProjectStartDate - Filter condition(s)

- AND (All of these are true)
 - GeoEventFlag = -1
 - PLAN_IMAGE != null
- NOT (None of these are true)
 - PROJSTART ISNULL

GEOEVENT EMAIL NOTIFICATIONS

ArcGIS GeoEvent Manager

Cluster - default | [Help](#) | [Sign Out](#)

Services Site Logs

Monitor Inputs **GeoEvent Services** Outputs

WaterProject_Notifications

Service used to poll water project polygons and send out notifications when certain criteria met.

[Publish](#) [Back](#)

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,840	0 /sec	6 /sec	14 Days, 00:45:40	
	Out	0	0 /sec	0 /sec	26 Days, 20:13:48	

```
graph LR; Input[WaterProjectInput] --> StartDate{ProjectStartDate}; Input --> WMAccepted{WM Accepted}; Input --> WarrantyStart{WarrantyStart}; Input --> InitialWalkThru{InitialWalkThru}; Input --> FinalWalkThru{FinalWalkThru}; StartDate --> StartDateEmail[WaterProj_StartDateEmail]; WMAccepted --> StartDateEmail; WMAccepted --> WarrantyBeginEmail[WaterProj_BeginWarrantyEmail]; WarrantyStart --> WarrantyBeginEmail; InitialWalkThru --> WalkThruEmail[WaterProj_WalkThruEmail]; FinalWalkThru --> FinalWalkThruEmail[WaterProj_FinalWalkThruEmail];
```

WaterProj_StartDateEmail

WaterProj_BeginWarrantyEmail

WaterProj_WalkThruEmail

WaterProj_FinalWalkThruEmail

Sender's email address: DoNotReply@rpu.org

Email Recipients: jforstner@rpu.org

Email Recipients (carbon copy):

Email Recipients (blind carbon copy):

Mail Subject: Project: \${TITLE}

Enter Message Body Here: \${TITLE} Project ID: \${PROJID} Start Date: \${PROJSTART} Plan: \${PLAN_IMAGE} Please map plan as proposed in GIS.

Advanced

GEOEVENT EMAIL NOTIFICATIONS

-----Original Message-----

From: DoNotReply@rpu.org [<mailto:DoNotReply@rpu.org>]

Sent: Wednesday, January 18, 2017 2:37 PM

To: Jay Forstner

Subject: Project: ESTATES AT WINDAMERE WOODS

ESTATES AT WINDAMERE WOODS

Project ID: 1926

Begin Warranty: Tue Jan 24 18:00:00 CST 2017 End Warranty: Fri Feb 17 18:00:00 CST 2017

Public Works has received the Engineers Certificate and started the warranty of the project.

FLAG UPDATED NOT FALSE (+1)

ArcGIS GeoEvent Manager interface showing the configuration for the **WaterProject_Notifications** service.

WaterProject_Notifications
Service used to poll water project polygons and send out notifications when certain criteria met.

Monitor | **Inputs** | **GeoEvent Services** | **Outputs**

Status: STARTED

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,840	0 /sec	6 /sec	14 Days, 00:44:26	
	Out	0	0 /sec	0 /sec	26 Days, 20:12:34	

Workflow Diagram:

```
graph LR; Input[WaterProjectInput] --> PStart{ProjectStartDate}; Input --> WMAccept{WM Accepted}; Input --> Warrant{WarrantyStart}; Input --> InitWalk{InitialWalkThru}; Input --> FinalWalk{FinalWalkthru}; PStart --> Email1[WaterProj_StartDateEmail]; WMAccept --> Email2[WaterProj_WMAcceptEmail]; Warrant --> AddFlag[GeoEventFlag_Add]; InitWalk --> AddFlag; FinalWalk --> Email3[WaterProj_FinalWalkThruEmail]; AddFlag --> Output[WaterProjects_Out];
```

GeoEventFlag_Add processor properties:

Property	Value
New GeoEvent Definition Name	FieldCalculator
Expression	GeoEventFlag + 1
New Field Name	
New Field Type	Boolean
New Field Tag	
Target Field	Existing Field
Existing Field Name	GeoEventFlag

ArcGIS GeoEvent Manager

Services

Site

Logs

Monitor Inputs **GeoEvent Services** Outputs

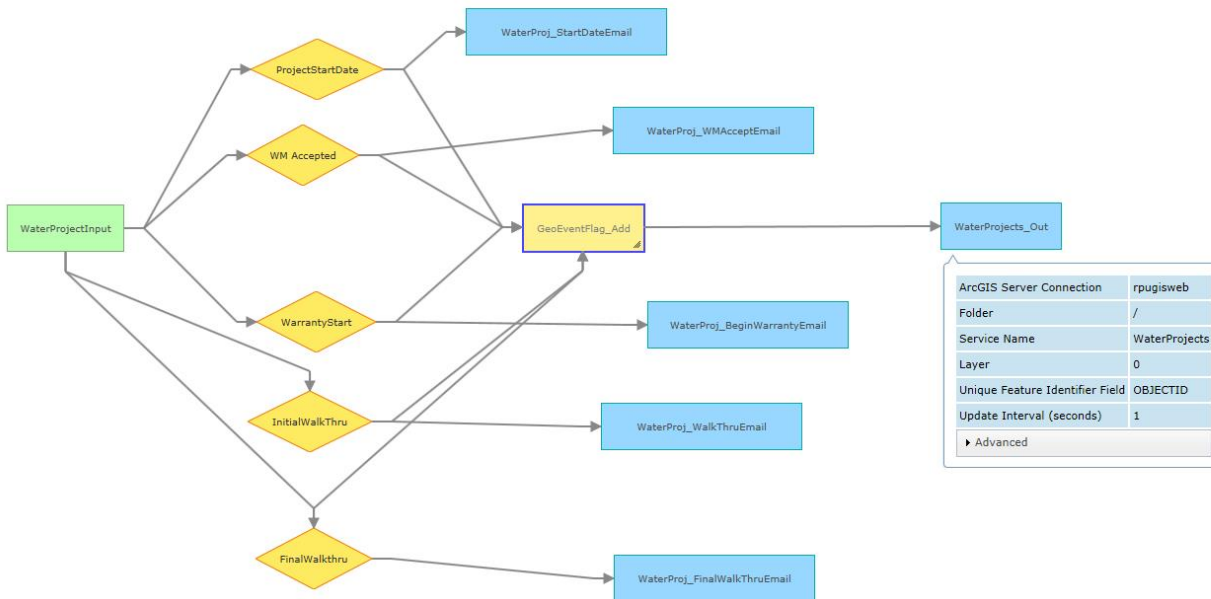
WaterProject_Notifications

Service used to poll water project polygons and send out notifications when certain criteria met.

Publish

Back

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,840	0 /sec	6 /sec	14 Days, 00:46:02	
	Out	0	0 /sec	0 /sec	26 Days, 20:14:10	



GEOEVENT OUTPUT UPDATES PROJECT POLY

Browser tabs: rpugisweb, Certificate error, Home, ArcGIS Server Manager, ArcGIS - Sign In, ArcGIS GeoEvent Man..., KorWeb (KJ-VMWEB9), Space: YOU | exchange, Welcome | GeoNet

Cluster - default | [Help](#) | [Sign Out](#)

ArcGIS GeoEvent Manager

Services Site Logs

Monitor Inputs GeoEvent Services **Outputs**

WaterProjects_Out (Update a Feature) Save Cancel

Name*:

ArcGIS Server Connection*: Register ArcGIS Server

Folder:

Service Name*:




Layer:

Unique Feature Identifier Field*:

Update Interval (seconds)*:

Advanced

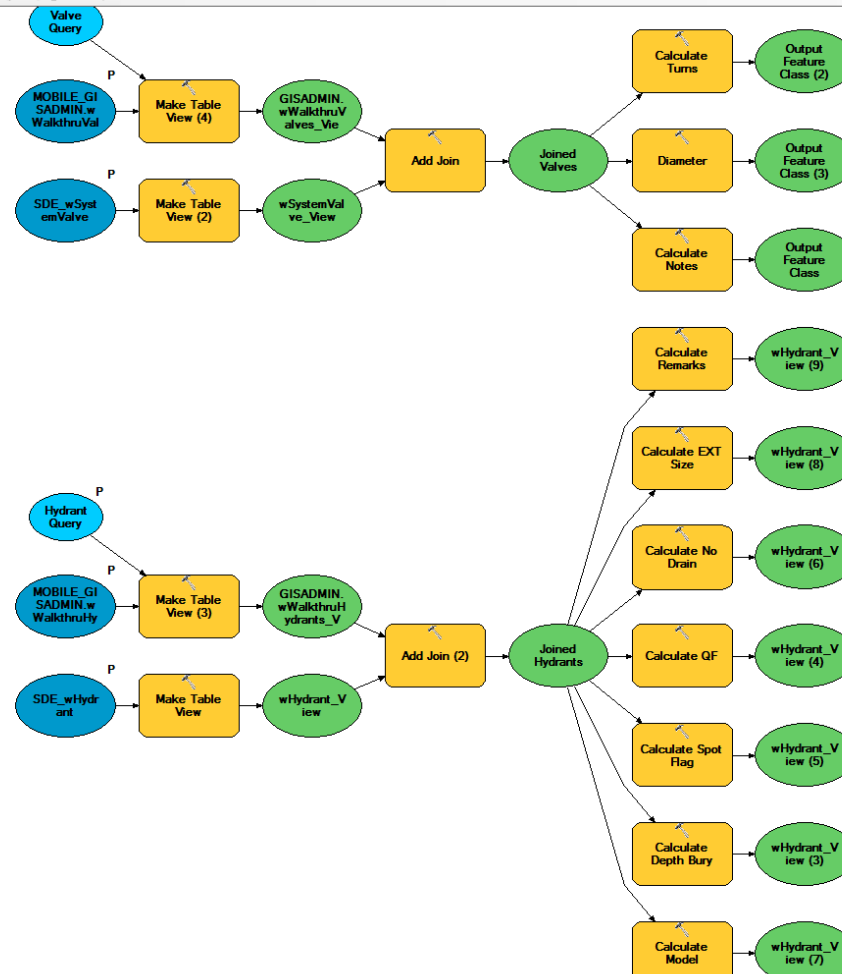
▼ Inputs

Name	Count	Rate
 NetworkfleetInput	426,559	0 /sec
 RCSM5 XML [Running On: RPUV125]	638	0 /sec
 WaterProjectInput [Running On: RPUV125]	1,840	0 /sec

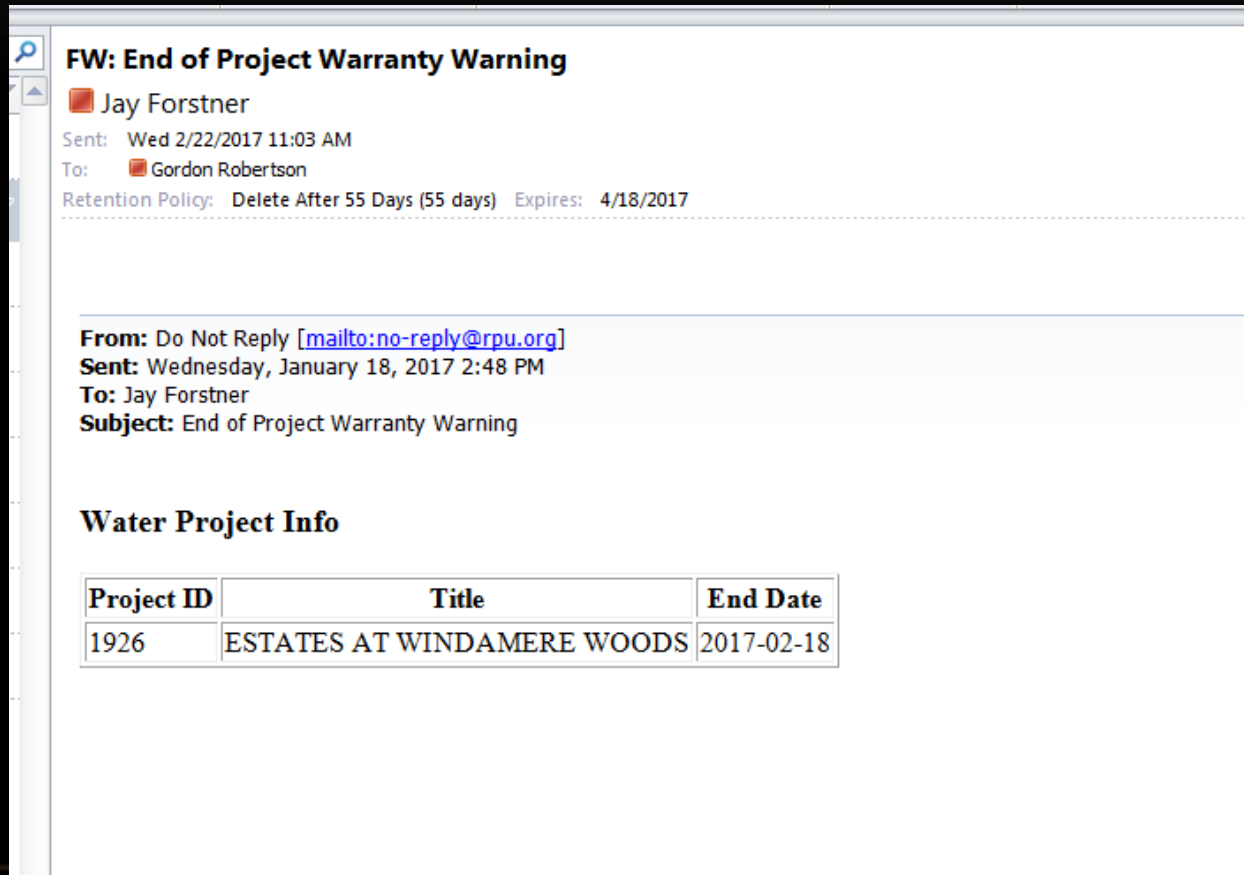
▼ Outputs

IMPORT FIELD CREW ATTRIBUTES MODEL

- wWalkthrus
- 1 - Create Walkthrus
 - 2 - Create WaterOperations Version (2)
 - 3 - Inspections to SDE
 - 4 - Inspections to FGDB
 - 5 - Reconcile and Post WaterOperations Version (2)
 - 6 - Delete Completed Inspections



SQL NOTIFICATION IN HTML



OPERATIONS DASHBOARD FOR MANAGERS

