BURNS McDONNELL

ILLINOIS COMMERCE COMMISSION

AMRP STAKEHOLDER WORKSHOP #4

PRESENTED BY

THE PEOPLES GAS LIGHT AND COKE COMPANY

23 FEBRUARY 2016

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CONSULTANT OVERVIEW

Burns & McDonnell is a national engineering firm of 5,500 professionals with decades of program management experience focusing on large scale utility programs.

BURNS & MCDONNELL PROGRAM MANAGEMENT CLIENTS INCLUDE:

- Eversource formerly Northeast Utilities
- NiSource
- NIPSCO
- FirstEnergy
- AltaLink
- Hydro One
- BG&E

BURNS & MCDONNELL UTILITY CLIENTS INCLUDE:

#1 Transmission and Distribution in North America *Engineering News-Record*

Burns & McDonnell is currently managing and has managed in excess of $2 billion of design, permitting and construction for major clients in the Chicago region over the past 20 years (many of which were mega linear infrastructure projects).

COST MODEL / BUDGET / SCHEDULE

As an **engineering and construction** firm, Burns & McDonnell:

- Annually performs over $2.0 billion of design, permitting and construction
- Is currently overseeing $15 billion of capital construction as program manager
- Has recently developed estimates/budgets for the following markets:

Oil & Gas:	$1.5 billion	Transmission & Distribution:	$1 billion
Facilities:	$750 million	Infrastructure:	$100 million
Environmental:	$150 million		

- Understands market conditions, historical cost implications, and importance of real-time stakeholder communication

BURNS & McDONNELL
INDUSTRY RANKINGS
Engineering News-Record

#1	Designer of the Year, ENR Midwest
#13	Top 50 Program Management Firms
#15	Top 100 Green Design Firms
#18	Top 500 Design Firms

PURPOSE OF COST AND SCHEDULE MODELS

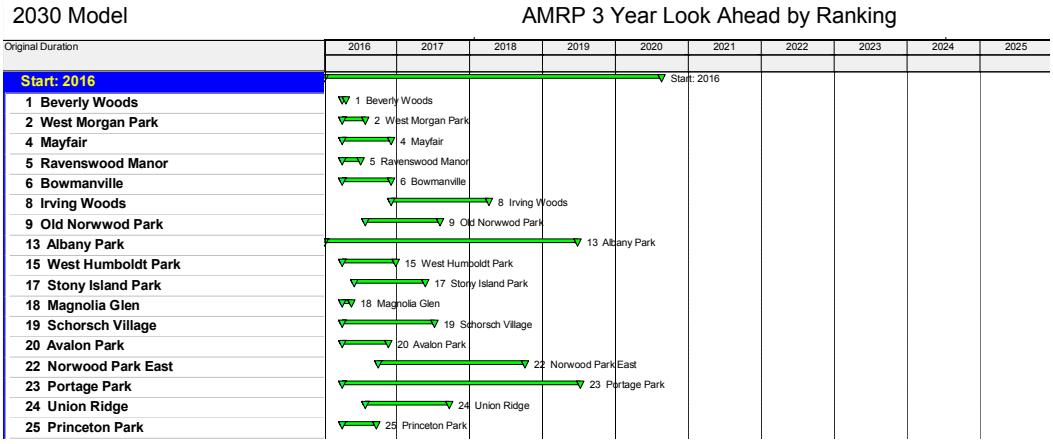
COST AND SCHEDULE MODELS (PRIMAVERA 6 AND MICROSOFT EXCEL):

- Establish cost and duration trends of large scale programs over time
- Facilitate front end planning
- Identify resources and constraints
- Provide an overview of the entire program

RELATIONSHIP BETWEEN **PROGRAM** AND **PROJECT** MANAGEMENT	
strategic	**operational**
TOP DOWN **PROGRAM MANAGEMENT**	BOTTOM UP **PROJECT MANAGEMENT**
• Senior Management Summary • Budget, Capacity, Milestones, Risk Benefits, Prioritization, Selection, Oversight, Evaluation • Models Management Decision Process	• Delivery of Individual Projects • Organizational Detail

SCHEDULING

- Use of a standard WBS and schedule templates allows easy modeling of projects in the outer years
- Project schedules in the upcoming program years get detailed out into lower WBS levels
- Use of an enterprise scheduling software allows resource management at the program level



BURNS & MCDONNELL SCOPE

- Create a schedule for the remaining gas distribution and transmission system upgrade.
- Create a cost forecast model in line with the schedule.
- Present a summary of results.

SEPTEMBER 2015

KICK OFF MEETING: 09/04

FAMILIARIZATION with the Program: 09/7-9

FIRST DATA REQUEST: 9/08

MEETINGS AND INTERVIEWS BEGIN: 09/10
executive management
accounting and finance
engineering
project services and permitting
construction
shops

OCTOBER

MODEL STRUCTURE & **WBS STRUCTURE APPROVED**: 10/06

MEETINGS AND INTERVIEWS END: 10/14

FIRST DATA RECEIVED: 9/15

OUTLINE OF REPORT: 10/27

LAST DATA RECEIVED: 10/30

NOVEMBER

FINAL REPORT: 11/30

DECEMBER

TRAINING COMPLETE: 1st Quarter 2016

MODEL OVERVIEW

TEMPLATE WORK BREAKDOWN STRUCTUIRE (WBS)	
WBS Code	**WBS Name**
Peoples Gas Model	**Peoples Gas AMRP - Rev 0**
Peoples Gas Model 0	**Other Capital Project Planning**
Peoples Gas Model 0.1	Public Improvement
Peoples Gas Model 0.2	System Improvement
Peoples Gas Model 0.3	System Expansion
Peoples Gas Model 1	**Program Level Activities**
Peoples Gas Model 1.1	Engineering
Peoples Gas Model 1.2	Escalation
Peoples Gas Model 1.3	Contingency
Peoples Gas Model 1.4	Program Management
Peoples Gas Model 2	**High Pressure Mains**
Peoples Gas Model 2.1	HP NW Extension w Gate Stn
Peoples Gas Model 2.2	HP NE Extension
Peoples Gas Model 2.3	HP Lower NE Connection
Peoples Gas Model 2.4	HP Extension from 73rd
Peoples Gas Model 2.5	HP SE Connection
Peoples Gas Model 2.6	HP Lower Central Connection w Gate Stn
Peoples Gas Model 2.7	HP SW Gate Station
Peoples Gas Model 2.8	HP Upper Central Connection
Peoples Gas Model 3	**Neighborhood Project Level**
Peoples Gas Model 3.000	AMRP EFFICIENCIES GAIN FROM PI/SI
Peoples Gas Model 3.MTR	2015 Meter Carryover
Peoples Gas Model 3.001	N001-Albany Park
Peoples Gas Model 3.002	N002-Altgeld Gardens
Peoples Gas Model 3.003	N003-Andersonville
Peoples Gas Model 3.004	N004-Arcadia Terrace

FACTORS INCORPORATED:

- Pipe Category (HP vs MP)
- Installation Distance
- Installation Location (Parkway, Sidewalk, Street, Alley)
- Installation Method (Open Cut, Directional Bore, Main Insertion)
- Pipe Diameter
- Pipe Material (Steel or Plastic)
- Crossings (Hydro and Railroad)
- Restoration (Per Length of Installation and Impacted Intersections)
- Program Management & Overhead Costs
- Escalation
- Contingency

CONSTRAINTS THAT INFLUENCE SCHEDULE:

- Annual Meter Installation
- Production Rates
- High Pressure Main Sequencing
- High Pressure Vault Dependence
- Neighborhood UMRI Rating
- Normal Seasonal Constraints
- Current System Constraints
- City of Chicago Moratoriums

PROGRAM LEVEL COSTS:

- Engineering
- Construction
- Escalation
- Program Management

PROJECT LEVEL COSTS:

- Restore
- Retire
- Services
- Meters

MODEL RESULTS

TOTAL PROGRAM COST	New Management Target Case (Billions)	Contingency Case Higher Restoration Costs (Billions)	Pre-Acquisition Path (Billions)
2030	$6.83	$8.33	$9.41
2040	$7.81	$9.69	$10.96
	▪ 75% PI/Si Out of Sequence Work Credit ▪ 14% Efficiency in Contractor Labor ▪ 7.5% Construction Contingency ▪ 80% Installation Efficiency (All MP & HP) ▪ 75% Program Management Efficiency ▪ 40% Reduction in Restoration Cost	▪ 60% PI/Si Out of Sequence Work Credit ▪ 90% Installation Efficiency (All MP & HP) ▪ 85% Program Management Efficiency ▪ 10% Reduction in Restoration Cost	**Base Assumptions:** Actual Program Cost to Date = $932.0M **Consisting of:** AMRP Construction to Date = $805.4M, Program Costs/Overheads/Etc. = $126.6M ▪ PI/SI Out of Sequence Work Credit = 50% ▪ Engineering Escalation = 2.10% ▪ Contractor Labor Escalation = 3.50% ▪ PGL Labor Escalation = 3.15% ▪ Material, Plastic Pipe Escalation = 1.54% ▪ Material, Steel Pipe Escalation = 3.00% ▪ Permit Escalation = 5.0% ▪ Engineering Contingency = 10% ▪ Construction Contingency = 10% ▪ Meter Installation Contingency = 10% ▪ Permit Contingency = 10% ▪ Program Management Contingency = 10% ▪ Other Program Cost Contingency = 10% ▪ Quantities and Sequencing per Neighborhood Assignments ▪ Unit Prices are Per Historical Data and Industry Standards ▪ Production Rates are Per Historical Data and Industry Standards

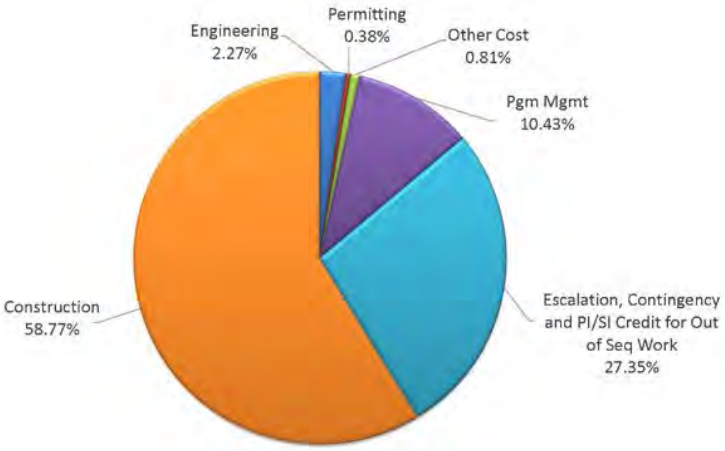
MODEL RESULTS

REFORMATTED COST MATRIX

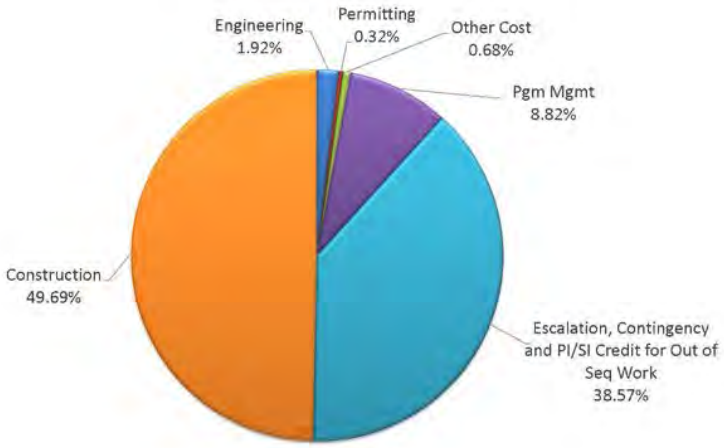
	Column A	Column B	Column C	Column D
Row 1	TOTAL PROGRAM COST	New Management Target Case (Billions)	Contingency Case Higher Restoration Costs (Billions)	Pre-Acquisition Path (Billions)
Row 2	2030	$6.83	$8.33	$9.41
Row 3	2040	$7.81	$9.69	$10.96
Row 4				
Row 5		**Base Assumptions:**		
Row 6			Actual Program Cost to Date = $932.0M	
Row 7		**Consisting of:**		
Row 8			**AMRP Construction to Date = $805.4M**	
Row 9			Program Costs/Overheads/Etc. = $126.6M	
Row 10	▪ PI/Si Out of Sequence Work Credit	75.00%	60.00%	50.00%
Row 11	▪ Engineering Escalation	2.10%	2.10%	2.10%
Row 12	▪ Contractor Labor Escalation	3.50%	3.50%	3.50%
Row 13	▪ PGL Labor Escalation	3.15%	3.15%	3.15%
Row 14	▪ Material, Plastic Pipe Escalation	1.54%	1.54%	1.54%
Row 15	▪ Material, Steel Pipe Escalation	3.00%	3.00%	3.00%
Row 16	▪ Permit Escalation	5.00%	5.00%	5.00%
Row 17	▪ Engineering Contingency	10.00%	10.00%	10.00%
Row 18	▪ Construction Contingency	7.50%	10.00%	10.00%
Row 19	▪ Meter Installation Contingency	10.00%	10.00%	10.00%
Row 20	▪ Permit Contingency	10.00%	10.00%	10.00%
Row 21	▪ Program Management Contingency	10.00%	10.00%	10.00%
Row 22	▪ Other Program Cost Contingency	10.00%	10.00%	10.00%
Row 26	▪ Efficiency in Contractor Labor	14.00%		
Row 27	▪ Installation Efficiency (All MP & HP)	80.00%	90.00%	
Row 28	▪ Program Management Efficiency	75.00%	85.00%	
Row 29	▪ Reduction in Restoration Cost	40.00%	10.00%	
Row 23	▪ Quantities and Sequencing per Neighborhood Assignments			
Row 24	▪ Unit Prices are Per Historical Data and Industry Standards			
Row 25	▪ Production Rates are Per Historical Data and Industry Standards			

MODEL RESULTS

2030 MODEL



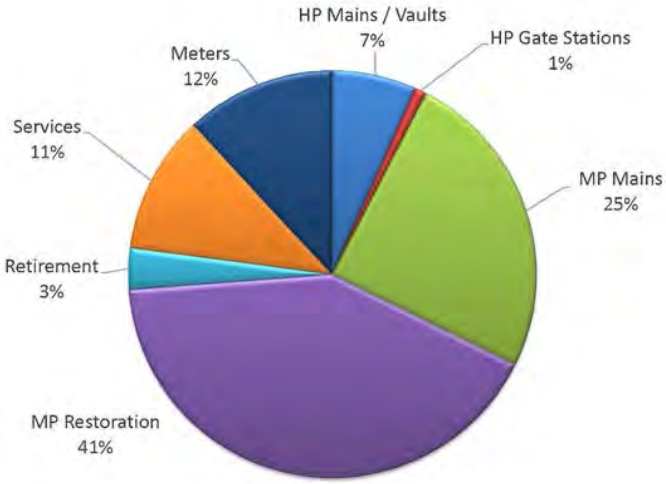
2040 MODEL



SUMMARY OF RESULTS
CONSTRUCTION COST BREAKDOWN

The graphics above illustrate the overall program costs broken down into the major cost centers. As you might note, the largest spend is the actual construction costs. The graph to the right breaks down the construction budget into major categories of the AMRP work.

2030 / 2040 MODEL



MODEL RESULTS

PROGRAM ANNUAL SPEND	
Annual Program Spend (Escalated)	
Annual Spend	$305,000,000

PROGRAM INPUTS	
Actual Cost to Date	$932,000,000
PI/SI Scope Credit	75%
Credit Reduction Over Time	0%

ADJUSTMENTS	
Progarm Management Efficiency	75%
Intersection Restore Factor	60%
Permitting Cost Factor	100%
Install Efficiency	80%

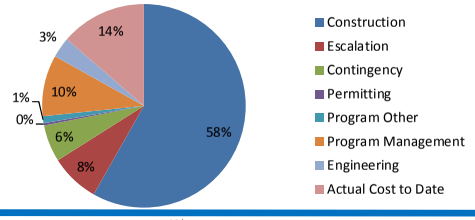
ESCALATIONS	
Funding	5.00%
Engineering	2.10%
Contractor Labor	3.00%
PGL Labor	3.00%
Material, Plastic Pipe	1.54%
Material, Steel Pipe	3.00%
Material, Other	2.38%
Permits	5.00%
Other Programs	0.00%

CONTINGENCIES	
Engineering	10.00%
Construction	7.50%
Meter Installation	10.00%
Permits	10.00%
Program Management	10.00%
Program Costs	10.00%
Other Programs	0.00%

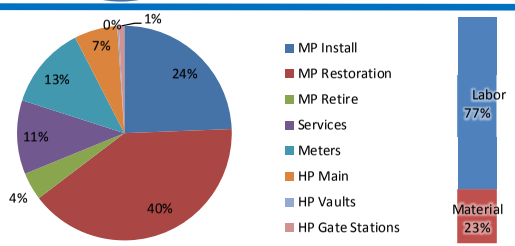
Year Complete	2030
Total Program Costs	$6,830,930,888

PROGRAM COST BREAKDOWN	
Actual Cost to Date	**$932,000,000**
AMRP Cost	**$5,898,930,888**
HP Projects	$348,177,320
MP Install	$1,118,912,870
MP Restore	$1,845,582,934
MP Retire	$192,069,049
Services	$509,797,884
Meters	$571,677,589
Engineering	$247,569,199
Permits	$37,548,978
Program Mgmt	$931,539,278
Program Costs	$96,055,789
Labor	$3,512,073,978
Material	$1,074,143,667
Overhead	$1,312,713,243

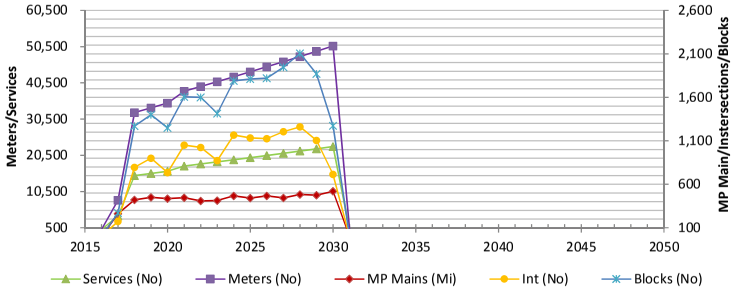
PROGRAM SUMMARY



CONSTRUCTION SUMMARY



PROGRAM EXECUTION BREAKDOWN



Metric	MIN.	AVG.	MAX.
Install (mi/yr)	262.3	438.5	519.5
Services (no/yr)	3,759	18,013	22,930
Meters (no/yr)	8,121	39,430	50,684
Int (no/yr)	100	120	140
Blocks (no/yr)	200	220	240