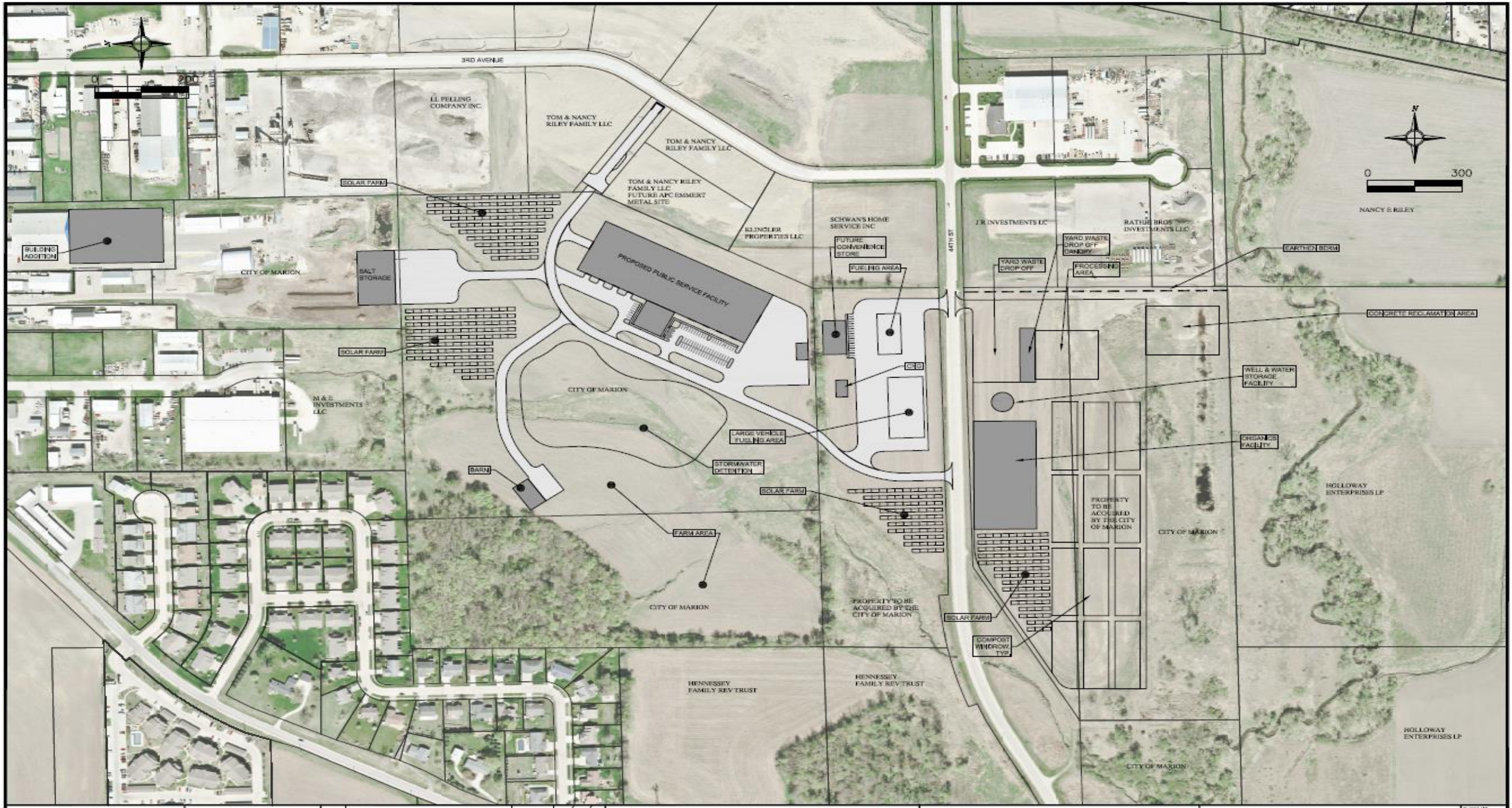

MARION
Public Services

ECO INDUSTRIAL PARK

MARION Public Services



ABES PROJECT NO: 313012	DRAWN BY: JAH APPROVED BY: JAH DATE: 1/12/16	NO. REVISION DESCRIPTION APPROVED DATE	ANDERSON BOGERT	Eco-Industrial Park	OVERALL SITE CONCEPT

SHEET NO. 1 OF 1

ECO INDUSTRIAL PARK

PHASE 1- PUBLIC SERVICE MAINTENANCE FACILITY
ALTERNATIVE FUEL FLEET/ INFRASTRUCTURE
DISTRIBUTED GENERATION

PHASE 2- TRANSPORATION FUELING FACILITIES

PHASE 3- MATERIAL RECOVERY FACILITIES

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ECO INDUSTRIAL PARK

Objective-Facilitate infrastructure improvements that will provide long term cost savings and address sustainability initiatives.

ECO INDUSTRIAL PARK
PHASE ONE

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Phase I Public Services Facility

Project Information

Category: City Facilities
Department: Public Services
Priority:
Fund: 670 - Solid Waste
610 - Sanitary Sewer
110 - Road Use Fund
Est. Completion Date: Fall 2019
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	
Planned Growth	X

Description & Scope:
Construction of new equipment maintenance and operations facility for Public Service. Integration of alternative fuel and renewable energy infrastructure.

Purpose:
The existing Public Services facility was built in 1992 with an addition added in 2004. The current facilities are limited in space and have been determined to be structurally inadequate. Integration of altnernative fuel and renewable energy infrastructure will allow project to provide long term cost savings.

History & Key Milestones:
Resolution 26043-Motion directing staff to proceed with Phase I of Eco Industrial Park.
Resolution 26044- Approving Engagement Letter with Piper Jaffray for the Eco Industrial Park.
Resolution No. 26186 setting a public hearing for August 3, 2017 regarding the Eco Industrial Park Grading Project.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	Total FY 2017-2022
FY2018 Proposed		7,000,000				7,000,000
FY2017 Adopted						-
Change	-	7,000,000	-	-	-	7,000,000

FUNDING SOURCES: As currently proposed, financing for facility construction would be achieved through the placement of Revnue Bonds that would be held with the following funds:

Road Use-$3,500,000 (25%)
Solid Waste-$1,750,000 (25%)
Sanitary Sewer-$1,750,000 (25%)

Annual bond payments would be made through operating expenditures from each fund. It is anticipated that the transporation fuel savings will offset a significant portion of the dept service payment.

Funding Overview	
Est. Total Project Cost	**7,000,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	-
Remaining Need	**7,000,000**

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	7,000,000
Furniture/Equipment	
Other	
Total	**7,000,000**

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Existing Public Service Maintenance Facilities

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Background-Public Service Maintenance Facilities

NOVEMBER 1990-MARION PUBLIC SERVICE FACILITY- 195 35TH STREET

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Project Background-Current Facilities

SPRING 1991-MARION PUBLIC SERVICE FACILITY- 195 35TH STREET

WINTER 1991-MARION PUBLIC SERVICE FACILITY- 195 35TH STREET

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Project Background-Current Facilities

SUMMER 1992

Facility completed at a total cost of $1.2 Million Dollars.

Provided 24,000 square feet of facility space.

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Project Background-Current Facilities

In 2004, Public Service expanded their facilities by utilizing a Cover-All fabric tension structure.

Objective of the facility was to provide transitory solution for equipment storage.

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Project Background-Current Facilities

Cost of the structure of the structure was just over $200,000 (24,000 square foot).

Structural and fabric warranty of 15 years.

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In 2013, fabric began to fail on both fabric tension facilities.

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Project Background-Eco Industrial Park Phase I

COVER-ALL BUILDING SYSTEMS

Dear valued customer:

THE FOLLOWING IS AN IMPORTANT SAFETY WARNING AND NOTICE CONCERNING YOUR COVER-ALL BUILDING SYSTEMS INC. TITAN BUILDING.

Recently, Cover-All Building Systems Inc. has undertaken a review of designs utilized for the Titan Building line. Although a review is not complete, there has been an initial determination that some of the structural members and connections for some of the spans of the **Titan Buildings** may not meet the present combined **wind and snow load capacity requirements of applicable building codes**.

We are working to obtain additional information, as well as to identify potential measures to address these issues for your building. Cover-All Building Systems Inc. intends to be proactive during the ongoing analysis and to take reasonable steps to promote your safety and the safety of others who may use your building.

Therefore, we are notifying you now of some safety steps. We intend to share additional information as it becomes available. At this time, in order to be appropriately cautious, we recommend you take the steps outlined below.

SAFETY WARNINGS FOR CONTINUED USE OF YOUR TITAN BUILDING:

- **Take precautions to see that your building is not occupied during severe weather, such as snow, sleet, freezing rain and winds in excess of 35 MPH (56 km/h). Post appropriate warnings on your building to prevent such use by others.**
- **Keep snow and ice off the roof and keep snow and ice clear from the sides of your building and do not occupy the building if there is any build up of snow or ice on the roof.**
- **If possible to do so safely, keep the internal temperature of your building warm to help prevent snow and ice from building up on the roof.**
- **We encourage you to consult your own structural engineer so that your building can be analyzed for the demands on the structure from local conditions and monitored for higher stress conditions.**
- **Depending on location and local regulations, it may be necessary to consult local building authorities.**

As noted above, Cover-All Building Systems Inc. is working to continue its review of design issues with Titan Buildings, as well as possible solutions. We sincerely regret any inconvenience this situation may cause.

Should you have any questions regarding this letter or any other matter concerning your building, please call the toll free number 877-551-5856.

Information on this matter will be posted on our web site at www.coverallfacts.net.

Sincerely,

Nathan Stobbe
President and Chief Executive Officer

Cover-All Building Systems, Inc • 3815 Wanuskewin Road • Saskatoon, SK Canada S7P 1A4
Web: www.coverall.net

Contacted vendor for repair and were notified of issues regarding potential structural failures of steel truss systems.

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The FUTURE. Built SMARTER. KJWW

July 8, 2014

Mr. Ryan Miller
City of Marion
195 35th Street
Marion, Iowa 52302

RE: Structure Analysis Results
City of Marion Public Works Building
Marion, Iowa
KJWW #14.0088.00

Dear Ryan:

At the request of the City of Marion, KJWW Engineering Consultants has completed an analysis of the Marion Public Works Equipment Storage fabric structure. The purpose of this analysis was to determine if the steel trusses, purlins, sway braces, and steel connections are adequate for 2012 IBC Code level loads. Foundations, weld integrity, bolt tightness, and tensile fabric analysis were not done. Based on our evaluation, the structure is not adequate to handle the combined effect of its self-weight, insulation, utilities, snow, and wind. Our analysis showed that multiple truss members and connections are overstressed 20 to 70% beyond their code allowed design capacity. It is our recommendation the City discontinues use of the building prior to winter weather. Our evaluation also indicates the building is designed for a 3-second wind gust of 75mph instead of the IBC 2012 code prescribed value of 105mph.

Our investigation was done using existing drawings dated August 4, 2004 and field measurements obtained on April 4, 2014. Field measurements were taken to the best of our ability without destructive means, and some educated assumptions needed to be made. If more accurate or additional measurements are desired, a testing agency can be hired to remove sections of the truss for additional steel member thickness measurements and material properties.

There are options the City of Marion can explore to extend the life of the structure. For example, strategically placed shoring posts can be used or overstressed truss members can be reinforced. While this design is out of KJWW's scope of services, if the city would like to discuss this please feel free to contact us at (319)730-7662.

305 2nd Avenue SE, Suite 362, Cedar Rapids, IA 52401
319.730.7662 | Fax: 319.730.7575 | www.kjww.com

Structural review was completed and it was indicated that multiple truss members and connections were severely overstressed (20% to 70% beyond code capacity).

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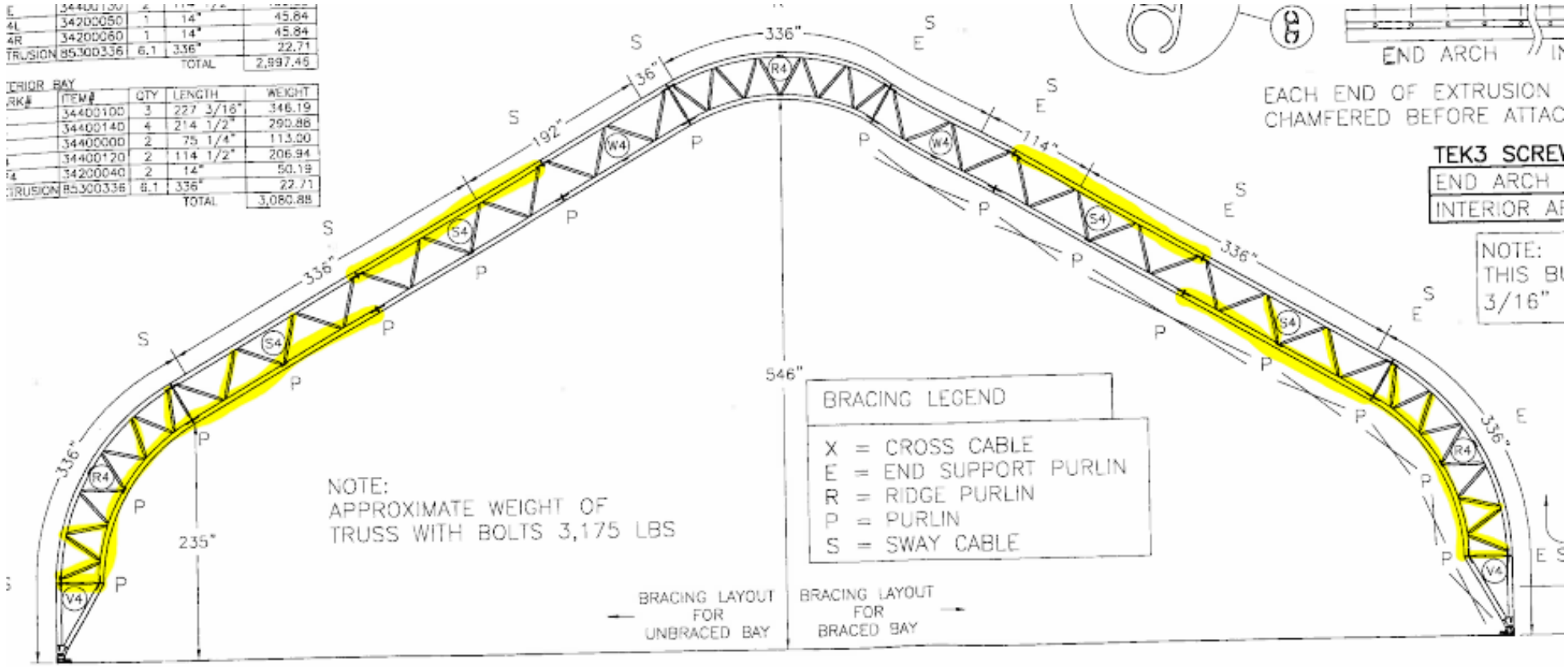

E	34400130	2	114 1/2"	206.94
4L	34200050	1	14"	45.84
4R	34200060	1	14"	45.84
TRUSION	85300336	6.1	336"	22.71
			TOTAL	2,997.46

ERIOR BAY

RK#	ITEM#	QTY	LENGTH	WEIGHT
	34400100	3	227 3/16"	346.19
	34400140	4	214 1/2"	290.86
	34400000	2	75 1/4"	113.00
	34400120	2	114 1/2"	206.94
4	34200040	2	14"	50.19
TRUSION	85300336	6.1	336"	22.71
			TOTAL	3,080.88

END ARCH

EACH END OF EXTRUSION
CHAMFERED BEFORE ATTAC

TEK3 SCREW
END ARCH
INTERIOR AR

NOTE:
THIS BU
3/16"

NOTE:
APPROXIMATE WEIGHT OF
TRUSS WITH BOLTS 3,175 LBS

BRACING LEGEND

X = CROSS CABLE
E = END SUPPORT PURLIN
R = RIDGE PURLIN
P = PURLIN
S = SWAY CABLE

BRACING LAYOUT FOR UNBRACED BAY

BRACING LAYOUT FOR BRACED BAY

MARION Public Services

KJWW Engineering to review the structural integrity of the tension fabric structure.

Structure design has recorded a number of (structural failures) within the last ten years.

2002-Oregon

2003- Philadelphia Regional Port Authority

2006-Pennsylvaina State Fair-Dairy Convention Facility

2007-Fort Plain, New York-Winter Deicer Storage Facility

2009-Irving, Texas –Dallas Cowboys Practice Facility

2010-Crawford County, Pennsylvania –Dairy Facility

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Proposed Public Service Maintenance Facilities

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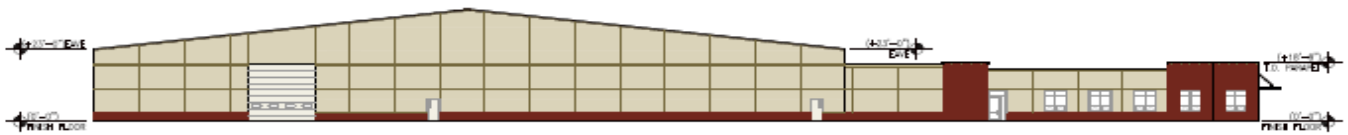
SOUTH ELEVATION
1" = 20'-0"

NORTH ELEVATION
1" = 20'-0"



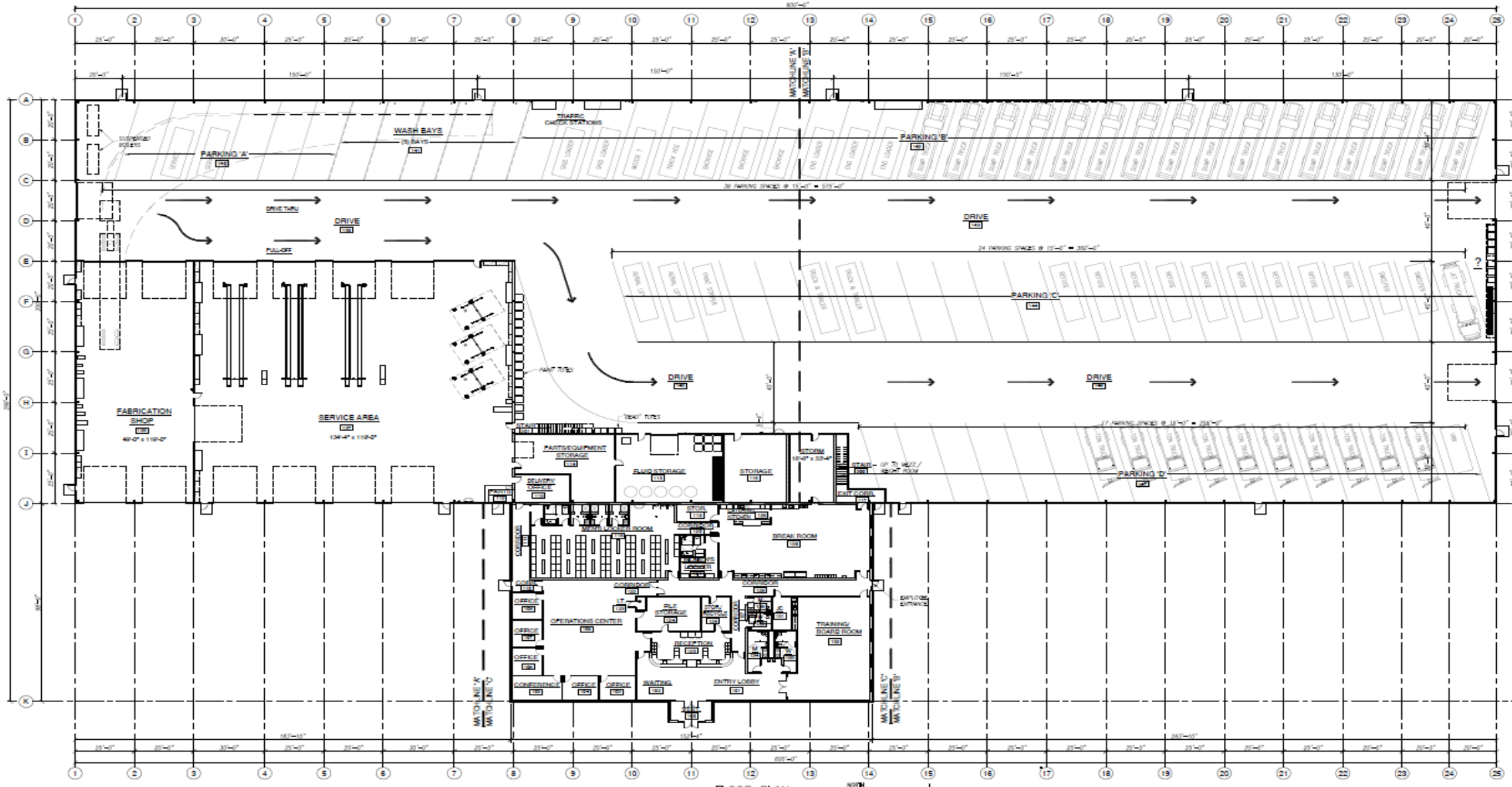
WEST ELEVATION
1" = 20'-0"

EAST ELEVATION
1" = 20'-0"

MARION ECO-INDUSTRIAL PARK
FACILITY BUILDING
MARION, IOWA

PRELIMINARY
FOR REVIEW ONLY
6-6-18

Knapp & warden LLC



FLOOR PLAN
1" = 20'-0"
15,105 BUSINESS SQUARE FOOTAGE

NOTE:
SEE ENLARGED PLAN FOR ADDITIONAL ROOM NUMBERS.

PARKING 79
LOCKERS 69

KEY PLAN

KEY

REFUSE	- (9) REFUSE TRUCKS	PAINT STRIPER	- (1) PAINT STRIPER	TRACK HOE	- (1) TRACK HOE	TRUCK & TRAILER	- (2) TRUCKS W/ TRAILERS
SWEEPER	- (2) STREET SWEEPERS	AERIAL LIFT	- (1) PAINT STRIPER	MOTOR 7	- (1) MOTOR 7		
VAC	- (1) TELESCOPE 7 VAN	END LOADER	- (3) END LOADERS	SKID LOADER	- (2) SKID LOADERS		
BUCKET TRUCK	- (2) BUCKET TRUCKS	BACKHOE	- (3) BACKHOES	SERVICE	- (2) SERVICE TRUCKS		

KEY

DUMP TRUCK	- (10) CLASS 7/8 DUMP TRUCKS W/ SNOW PLOWS
1 TON TRUCK	- (12) 1 TON 5/6 TRUCKS W/ SNOW PLOW
JET TRUCK	- (1) SEWER JET TRUCK

PRELIMINARY FOR REVIEW ONLY 5-18-18

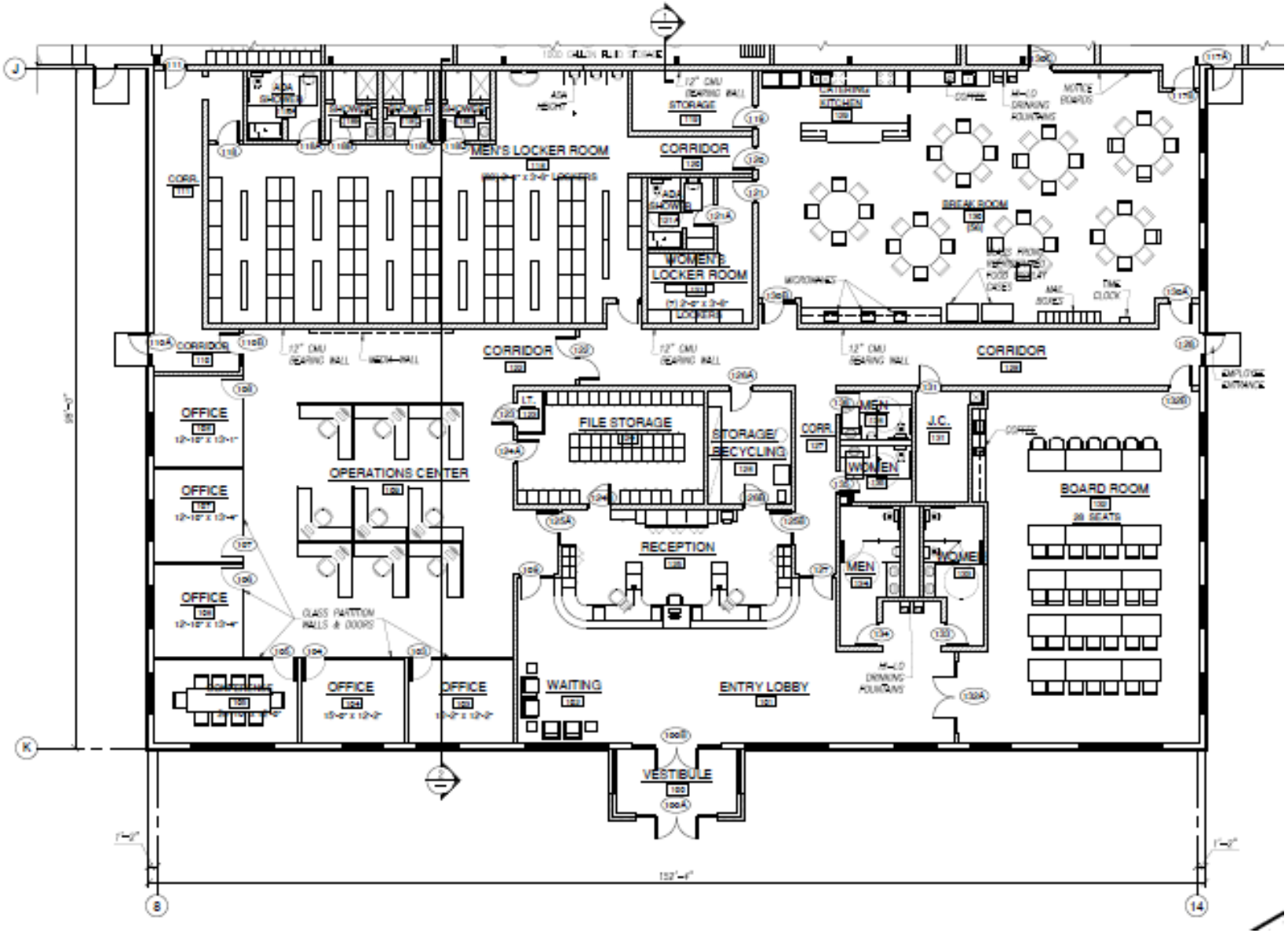
Knapp Warden LLC

PROJECT: MARION ECO-INDUSTRIAL PARK
MAIN FACILITY BUILDING
MARION, IOWA

DRAWING TITLE: FLOOR PLAN

SCALE: AS NOTED
DRAWN BY: MJH
CHECKED BY: MJH
PROJECT NO: 17041
DATE: 05/30/2018

DRAWING NUMBER: A1



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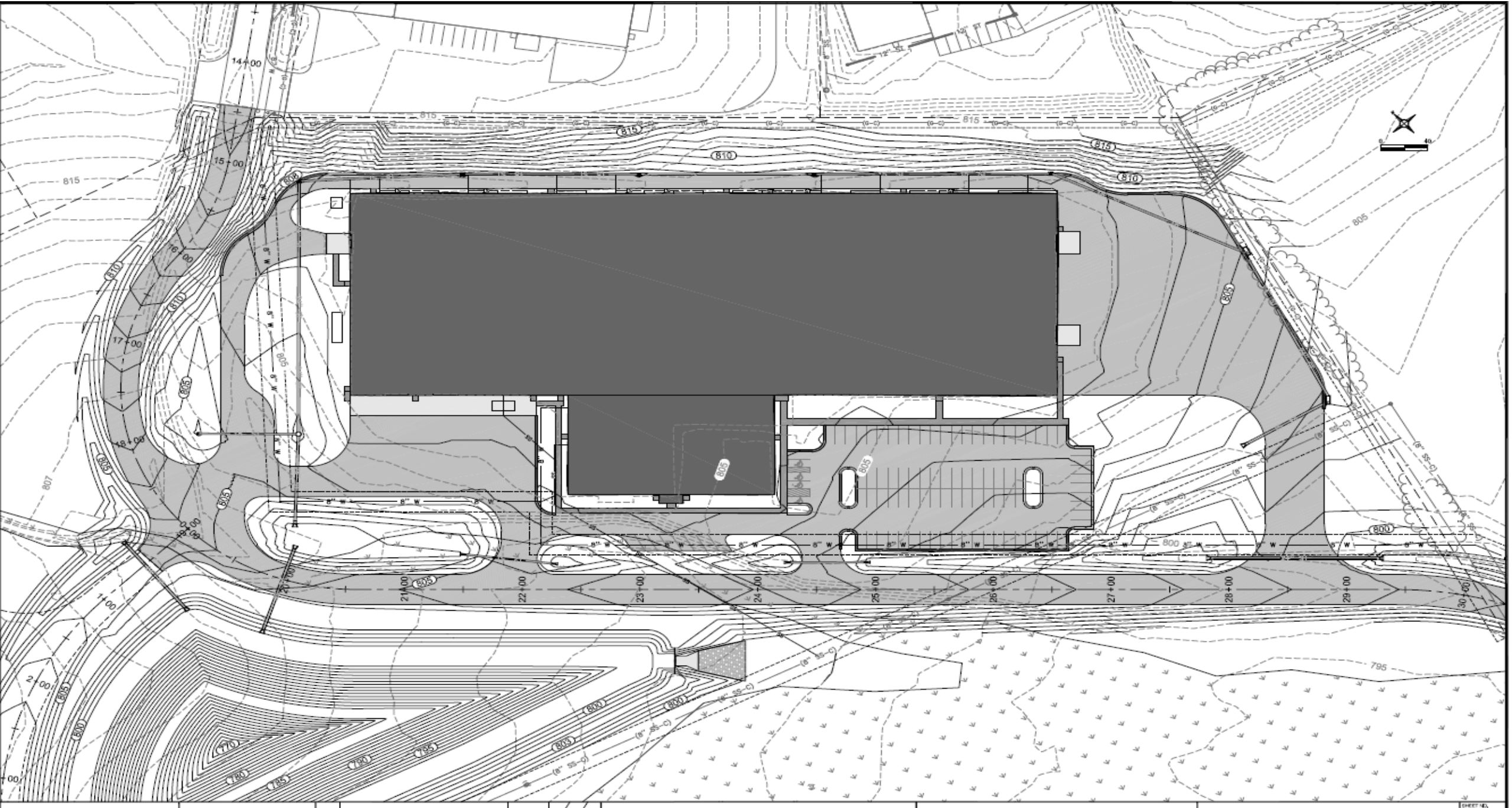


ABES PROJECT NO: 313012	DRAWN BY: JAH APPROVED BY: JAH DATE: 1/12/16	NO.	REVISION DESCRIPTION	APPROVED	DATE	ANDERSON BOGERT	Eco-Industrial Park	GRADING PLAN	SHEET NO. C200 OF C201

PROPOSED PUBLIC SERVICE MAINTENANCE FACILITY

- Thirty to Forty Year Design Life to allow for continued growth and expansion of maintenance operations.

- Design incorporates hardened Operations Center and Storm Shelter to meet Essential Facility Classification.

- Incorporates bulk storage and handling systems for commodities

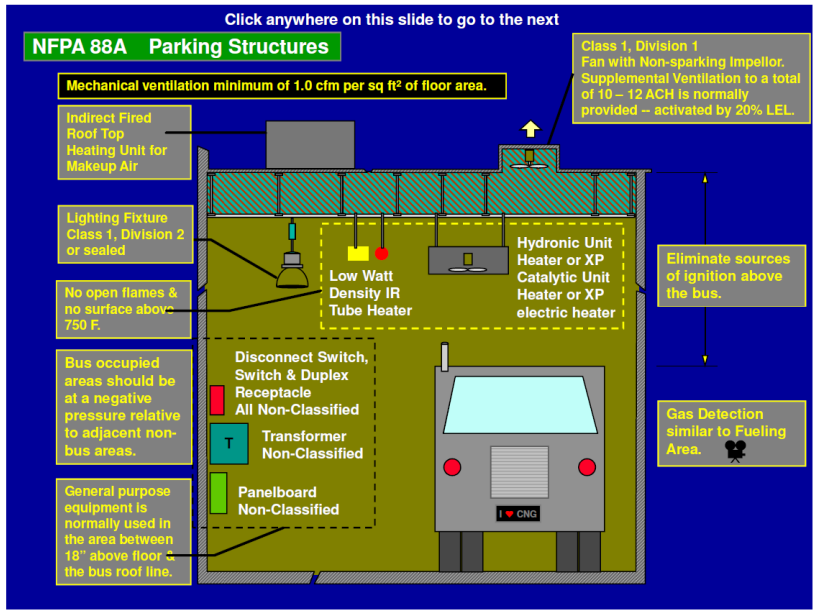
- Facility designed for maintenance and storage of alternative fueled vehicles.

MARION Public Services

MAINTENANCE FACILITIES FOR COMPRESSED NATURAL GAS VEHICLES.

Lighting Systems

Gas Detection Systems



Heating and Ventilating Systems

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Phase I Public Services Facility

Project Schedule

SCHEDULE OF IMPROVEMENTS	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
DESCRIPTION	2018	2018	2018	2018	2018	2018	2018	2018	2018	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
PUBLIC SERVICE FACILITY ADMINSTRATIVE SCHEDULE																					
CONSTRUCTION MANAGER SELECTION																					
RESOLUTION-CONSTRUCTION MANAGER AGREEMENT			PROPOSED																		
FINANCE SCHEDULE																					
RESOULTION-SETTING PUBLIC HEARING FOR REV BOND SALE					PROPOSED																
PUBLIC HEARING-REVENUE BOND SALE																					
UTILITY INSTALLATIONS																					
NATURAL GAS			PROPOSED																		
FIBER OPTICS				PROPOSED																	
WATER					PROPOSED																
ELECTRIC						PROPOSED															
SEWER							PROPOSED														
ARCHITECTURE AND ENGINEERED DRAWINGS																					
STRUCTURAL				PROPOSED																	
ELECTRICAL				PROPOSED																	
ENERGY MODELING					PROPOSED																
MECHANICAL					PROPOSED																
CIVIL			PROPOSED																		
SUBCONTRACTOR BID PACKAGES																					
STEEL BUILDING PACKAGE						PROPOSED		CONSTRUCTION													
MECHANICAL						PROPOSED			CONSTRUCTION			CONSTRUCTION									
PLUMBING						PROPOSED			CONSTRUCTION			CONSTRUCTION									
SPRINKLER						PROPOSED						CONSTRUCTION									
ELECTRICAL						PROPOSED					CONSTRUCTION										
CONCRETE-FLOOR						PROPOSED						CONSTRUCTION									
CONCRETE-FOOTINGS						PROPOSED		CONSTRUCTION													
PRECAST WALL SYSTEMS						PROPOSED				CONSTRUCTION											
GLAZING/DOOR SYSTEMS						PROPOSED						CONSTRUCTION									
SHOP SYSTEMS							PROPOSED					CONSTRUCTION									
DISTRIBUTED GENERATION SYSTEMS																					
TBD																					

PRELIMINARY

PUBLIC SERVICE MAINTENANCE FACILITY-NEXT STEPS

SELECTION OF CONSTRUCTION MANAGER

COMPLETE ENERGY ANALYSIS (WEIDT GROUP) AND APPROVAL OF MECHANICAL DESIGN.

SCHEDULE PUBLIC HEARINGS IN ACCORDANCE WITH BOND ADVISOR 2-3 MONTHS.

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Geothermal/Renewable Systems

Project Information

Category: City Facilities
Department: Public Services
Priority:
Fund: 110 - Road Use Fund
670 - Solid Waste
610 - Sanitary Sewer
Est. Completion Date: 2019-2022
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	
Planned Growth	X

Description & Scope:
Integration of geothermal systems and renewable energy infrastructure to include solar and/or wind generation.

Purpose:
Would allow for city facilities to become energy independent by utilizing renewable energy resources. Provide long term cost savings to the city. Purposed system could be leased and/or financed through energy savings.

History & Key Milestones: Phase I of Eco Industrial Park is programming both geothermal and renewable energy systems.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2019 Proposed			1,500,000				**1,500,000**
FY2017 Adopted							-
Change	-	-	1,500,000	-	-	-	**1,500,000**

Operating Impact: Long term utility savings with renewable energy infrastructure.

Funding Overview	
Est. Total Project Cost	**1,500,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	1,500,000
Remaining Need	-

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	
Furniture/Equipment	
Other	
Total	-

Funding Source(s): Power Purchase Agreement

Notes: The Weidt Group from Minnesota is currently peforming energy analysis on facility.

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THE WEIDT GROUP
the energy practice of EYP Inc.

About Us

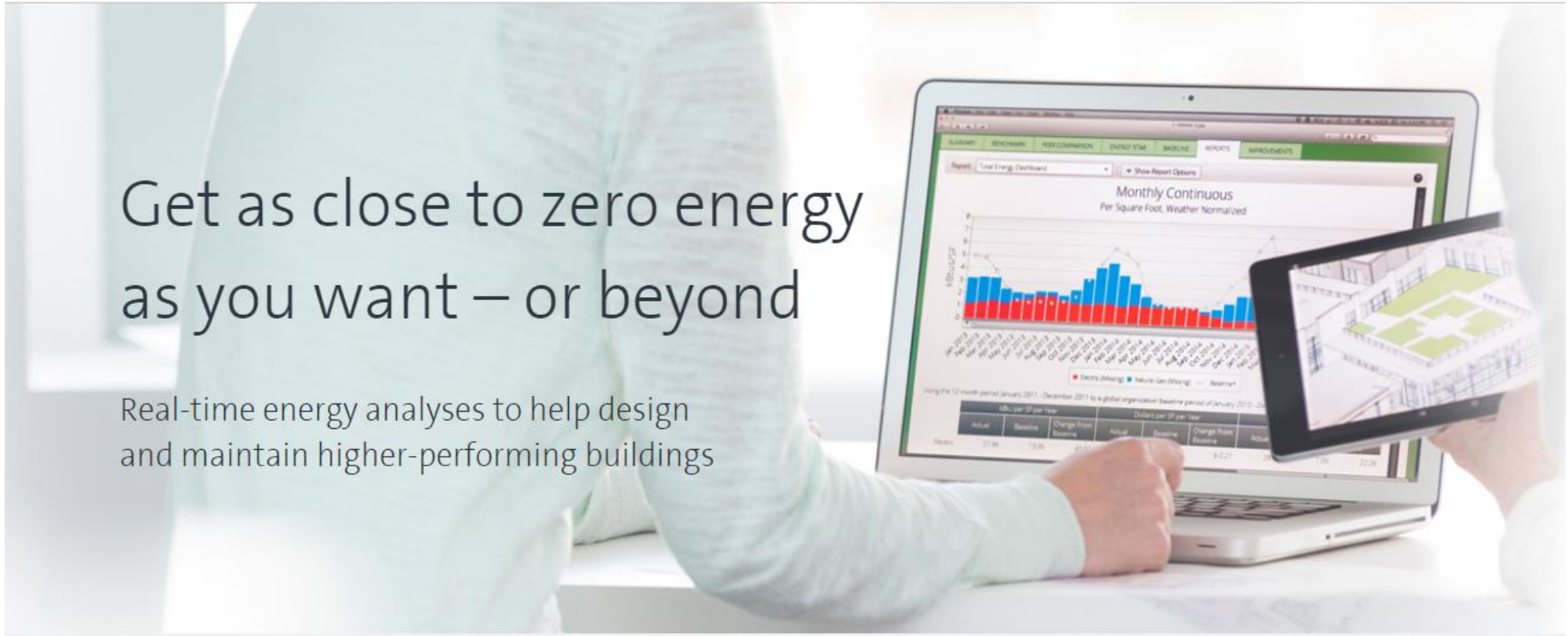
Demand-Side Management
Maximize Program Results

Energy Design Assistance
Maximize Savings

B3 Benchmarking
Track, Manage & Improve

Building Performance
Upgrade Existing Buildings

Custom Tools
Design Apps That Influence



Get as close to zero energy as you want – or beyond

Real-time energy analyses to help design and maintain higher-performing buildings

Our customizable software platform makes it easy for design teams, utilities and building owners to maximize performance in new and existing buildings of any type, size or age.

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COMMERCIAL NEW CONSTRUCTION PROGRAM

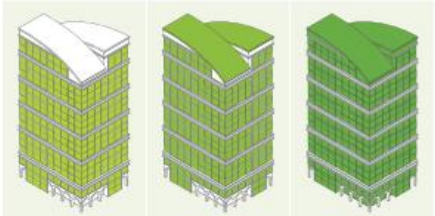
It pays to make energy efficiency part of the plan.

AS A PROGRAM PARTICIPANT YOU WILL RECEIVE THE FOLLOWING COMPLIMENTARY SERVICES:

- A customized energy model simulating how energy will be used
- Assistance identifying and evaluating energy-saving strategies
- Analysis of energy costs and paybacks
- Financial incentives to help offset the cost of implementing energy-saving strategies

YOUR PROJECT

The energy consultants will create virtual versions of your building to help determine which bundle of energy efficiency strategies makes the most sense for your project.



	BUNDLE A	BUNDLE B	BUNDLE C
Implementation Cost:	$136,016	$203,404	$261,021
Utility Rebate:	$27,626	$37,691	$60,795
Annual Energy Savings:	$14,028	$17,302	$25,156
Payback Period:	7.7 years	9.6 years	8 years

WHY SHOULD I PARTICIPATE?

- Receive fast and reliable energy analysis
- Compare multiple combinations of building systems and energy-saving strategies to see the impacts to your future energy bills
- Have energy questions answered by a dedicated team of knowledgeable consultants
- Receive rebates based on kWh and therm savings above code, as predicated by the energy model

Alliant Energy | Black Hills Energy | MidAmerican Energy

COMMERCIAL NEW CONSTRUCTION PROCESS

DOES MY PROJECT QUALIFY?

- **Type of Project:** New construction, addition or major renovation with a mechanical system replacement
- **Size:** Energy upgrades impacting 5,000 sq. ft. or more of the building
- **Service:** Heated and/or cooled using electricity or natural gas provided by a participating Iowa utility
- **Timing:** At a point in the decision-making process where energy analysis results may influence implementation of energy-efficient strategies

ONLINE APPLICATION

Complete the screening form on your partnering utility's website or visit www.energyassistance.twgi.com/cnc

1 WEEK

INTRO CALL

Conference call with an energy consultant

- Scope of work and goals
- Use and size of building
- Mechanical system(s) considered

1 WEEK

INTERACTIVE ENERGY MODELING

Create virtual versions of your building utilizing an interactive energy modeling tool to show:

- Estimated energy savings
- Implementation costs
- Payback periods
- Rebate estimates

CUSTOM STRATEGIES

Complex energy efficiency strategies may require advanced modeling and a second results meeting. Ask your energy consultant if the strategy is eligible for complimentary advanced modeling.

6-8 WEEKS

SELECT A BUNDLE

BUNDLE REQUIREMENTS DOCUMENT

Receive a Bundle Requirements document that provides a guideline to reach your energy conservation goal including your projected rebate.

CONSTRUCTION

CONSTRUCTION COMPLETION

Energy consultant visits site and publishes draft verification report documenting implemented strategies following review of:

- Construction plans and specifications
- Construction submittals

4-6 WEEKS

VERIFICATION REPORT

Energy consultant issues final verification report indicating which strategies have been successfully implemented and rebate amount.

RECEIVE REBATE CHECK

CONTACT THE PROGRAM IMPLEMENTOR: THE WEIDT GROUP

877-939-1874 OR CNC@TWGI.COM

1775531717

Renewable Energy Infrastructure

MARION Public Services

DISTRIBUTED GENERATION/RENEWABLE ENERGY

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DISTRIBUTED GENERATION/RENEWABLE ENERGY

Power Purchase Agreement-is a contract between two parties, one which generates electricity (the seller) and one which is looking to purchase electricity (the buyer).

Benefits for Tax Liable Lessor

30% FEDERAL TAX CREDIT
MARCS/ACCELERATED DEPRECIATION SCHEDULE
50% BONUS DEPRECAITION

Power is sold directly back to the entity.

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DISTRIBUTED GENERATION/RENEWABLE ENERGY

CITY OF DUBUQUE PUBLIC WORKS-Power Purchase agreement with Eagle Point Solar.

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Grid-Connected System: Main results

Project : Marion IA project
Simulation variant : New simulation variant

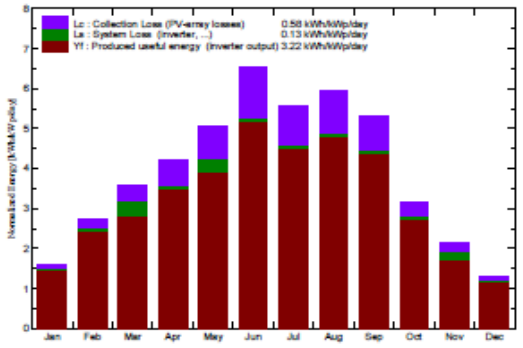
Main system parameters				
PV Field Orientation	System type	Grid-Connected		
	Sheds disposition, tilt	20°	azimuth	0°
PV modules	Model	JAP6-72-320/3BB	Pnom	320 Wp
PV Array	Nb. of modules	21762	Pnom total	**6964 kWp**
Inverter	Model	PowerXpert 1666-CEC	Pnom	1666 kW ac
Inverter pack	Nb. of units	3.0	Pnom total	**4998 kW ac**
User's needs	Unlimited load (grid)			

Main simulation results

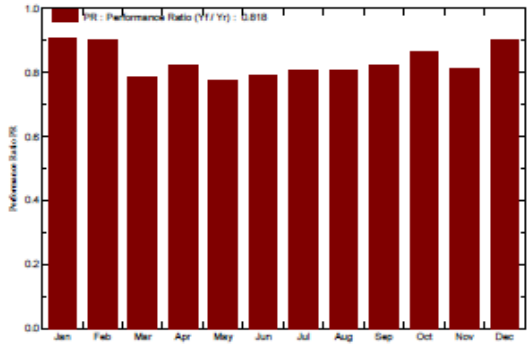
System Production

Produced Energy	**8183 MWh/year**	Specific prod.	1175 kWh/kWp/year
Performance Ratio PR	81.8 %		

Normalized productions (per Installed kWp): Nominal power 6964 kWp



Performance Ratio PR



New simulation variant
Balances and main results

	GlobHor kWh/m²	T Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	EffArrR %	EffSysR %
January	38.1	-7.82	49.6	45.1	323	313	15.44	14.95
February	59.0	-3.07	76.2	70.3	492	479	15.30	14.91
March	95.8	4.26	110.9	102.4	689	668	14.73	13.00
April	119.3	10.08	127.0	117.2	745	728	13.90	13.59
May	154.1	15.23	156.9	145.1	919	845	13.89	12.77
June	195.4	22.93	196.1	182.3	1101	1079	13.31	13.05
July	169.9	21.56	172.5	159.9	991	971	13.62	13.34
August	172.8	21.68	184.4	171.4	1054	1033	13.56	13.28
September	137.7	18.50	159.9	148.8	936	918	13.88	13.60
October	78.6	11.06	98.5	91.1	605	592	14.57	14.24
November	47.2	4.65	64.1	59.0	405	363	14.98	13.42
December	30.7	-11.46	40.3	36.5	263	254	15.46	14.92
Year	1298.6	9.01	1436.5	1329.0	8524	8183	14.07	13.51

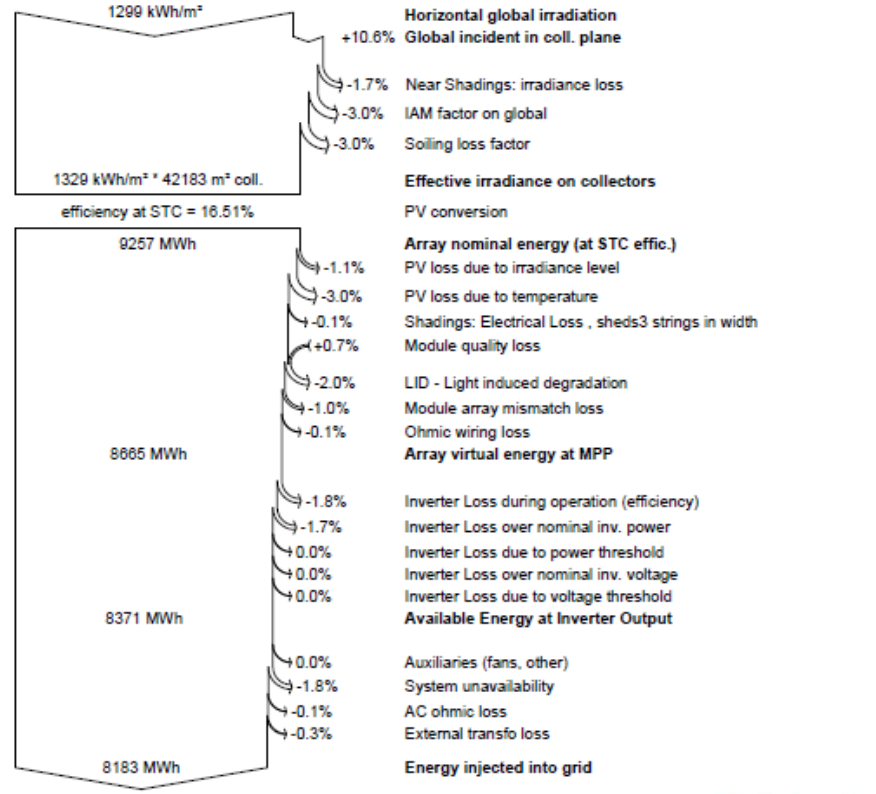
Legends:
GlobHor Horizontal global irradiation
T Amb Ambient Temperature
GlobInc Global incident in coll. plane
GlobEff Effective Global, corr. for IAM and shadings
EArray Effective energy at the output of the array
E_Grid Energy injected into grid
EffArrR Effic. Eout array / rough area
EffSysR Effic. Eout system / rough area

Grid-Connected System: Loss diagram

Project : Marion IA project
Simulation variant : New simulation variant

Main system parameters				
PV Field Orientation	System type	Grid-Connected		
	Sheds disposition, tilt	20°	azimuth	0°
PV modules	Model	JAP6-72-320/3BB	Pnom	320 Wp
PV Array	Nb. of modules	21762	Pnom total	**6964 kWp**
Inverter	Model	PowerXpert 1666-CEC	Pnom	1666 kW ac
Inverter pack	Nb. of units	3.0	Pnom total	**4998 kW ac**
User's needs	Unlimited load (grid)			

Loss diagram over the whole year



MARION Public Services


Melink GEO
GEOTHERMAL HVAC
Discover the most energy efficient way to heat and cool a building

HOW WE HELP

PROJECT DEVELOPMENT & FINANCING

- Creative third-party financing solutions, including leasing options, Property Assessed Clean Energy (PACE), Certificates of Participation (COPs), and HB 264
- Incentives include 10 percent Investment Tax Credit, accelerated depreciation (MACRS) and utility rebates

DESIGN & INSTALLATION

- Independent Geothermal Thermal Conductivity Test / In-situ thermal response tests
- Professionally engineered optimal designs for long-term performance while balancing first cost

MAINTENANCE & MONITORING

- Patented Melink Manifest™ Pre-Engineered Pump Station
- Supplier of groundsource heat pumps and high density polyethylene(HDPE) pipe to lower cost

MAINTENANCE & MONITORING

- Independent flush and purge of all piping
- Verification that ground loop is installed to engineer's specification

EXECUTIVE SUMMARY

A formation thermal conductivity test was performed on the horizontal bore installed at a depth of eighteen feet with a GPS location of N 42.02800248° (latitude), W 91.56716120° (longitude) at the Marion Recycling Center site in Marion, Iowa. The horizontal bore was completed on May 30, 2018 by A-One Geothermal. Geothermal Resource Technologies' (GRTI) test unit was attached to the horizontal bore on the afternoon of June 8, 2018.

This report provides an overview of the test procedures and analysis process, along with plots of the loop temperature and input heat rate data. The collected data was analyzed using the "line source" method and the following average formation thermal conductivity was determined.

Formation Thermal Conductivity = 1.19 Btu/hr-ft-°F

Due to the necessity of a thermal diffusivity value in the design calculation process, an estimate of the average thermal diffusivity was made for the encountered formation.

Formation Thermal Diffusivity ≈ 0.82 ft^2/day

The undisturbed formation temperature for the tested bore was established from the initial loop temperature data collected at startup.

Undisturbed Formation Temperature as of 6-8-18 ≈ 48.5-48.9°F

The undisturbed soil temperature may vary seasonally in a horizontal bore. Previous tests on vertical bores in the area have had undisturbed temperatures in the range of 51.5-55°F. Additional resources may need to be consulted to determine an appropriate design value.

The formation thermal properties determined by this test do not directly translate into a loop length requirement (i.e. feet of bore per ton). These parameters, along with many others, are inputs to commercially available loop-field design software to determine the required loop length. Additional questions concerning the use of these results are discussed in the frequently asked question (FAQ) section at www.grti.com.

TEST BORE DETAILS

(AS PROVIDED BY ENVIRONMENTAL RESOURCE SERVICES, INC.)

Site Name	Marion Recycling Center
Location	Marion, IA
Driller	A-One Geothermal
Installed Date	May 30, 2018
Borehole Diameter	6 inches
Borehole Depth	18 ft
U-Bend Size	1 inch HDPE
U-Bend Length Below Grade	450 ft
Grout Type	GeoPro PowerTECx
Grout Mixture	100 lb TG Lite, 15 lb PowerTECx, 30 gal water
Grouted Portion	Entire bore

DRILL LOG

FORMATION DESCRIPTION	DEPTH (FT)
Brown gray clay with sand pockets, wet	0'-18'

MARION Public Services

THERMAL CONDUCTIVITY TEST DATA

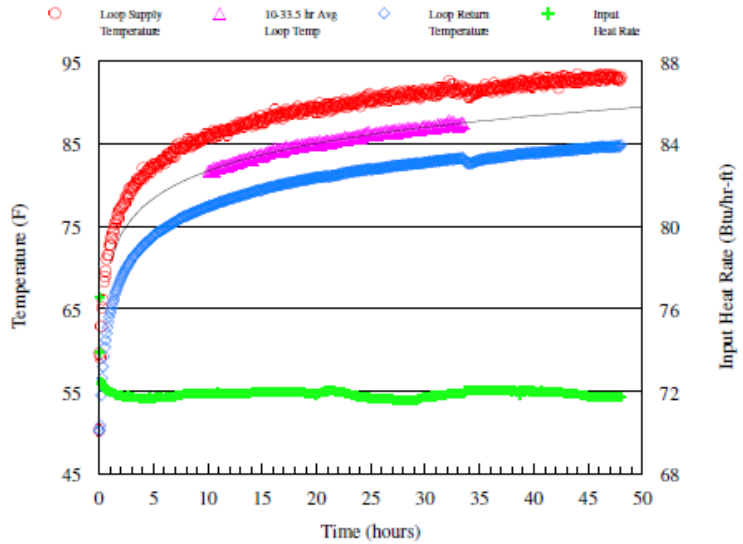


FIG. 1: TEMPERATURE & HEAT RATE DATA VS TIME

Figure 1 above shows the loop temperature and heat input rate data versus the elapsed time of the test. The temperature of the fluid supplied to and returning from the U-bend are plotted on the left axis, while the amount of heat supplied to the fluid is plotted on the right axis on a per foot of bore basis. In the test statistics below, calculations on the power data were performed over the analysis time period listed in the Line Source Data Analysis section.

SUMMARY TEST STATISTICS

Test Date	June 8-10, 2018
Duration	48.0 hr
Average Voltage	230.5 V
Average Heat Input Rate	32,324 Btu/hr (9,471 W)
Avg Heat Input Rate per Foot of Bore	71.8 Btu/hr-ft (21.0 W/ft)
Circulator Flow Rate	7.7 gpm
Standard Deviation of Power	0.19%
Maximum Variation in Power	0.43%

LINE SOURCE DATA ANALYSIS

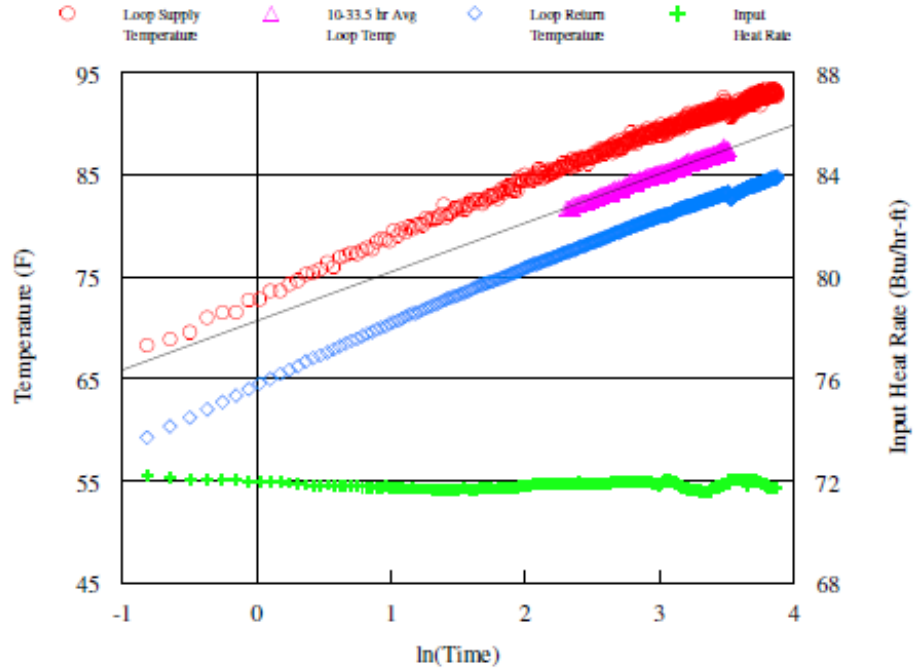


FIG. 2: TEMPERATURE & HEAT RATE VS NATURAL LOG OF TIME

The loop temperature and input heat rate data versus the natural log of elapsed time are shown above in Figure 2. The temperature versus time data was analyzed using the line source method (see page 3) in conformity with ASHRAE and IGSHPA guidelines. A linear curve fit was applied to the average of the supply and return loop temperature data between 10 and 33.5 hours. The slope of the curve fit was found to be 4.80. The resulting thermal conductivity was found to be **1.19 Btu/hr-ft-°F**.

MARION Public Services

COMPRESSED NATURAL GAS FUELING STATION

MARION Public Services

Capital Improvement Program

City Equipment

Compressed Natural Gas Fueling Facilities

Project Information

Category: City Equipment
Department: Public Services
Priority:
Fund: 110 - Road Use Fund
111 - Road Use Replacement

Est. Completion Date:
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	

Description & Scope:
Compressed Natural Gas fueling infrastructure that will be capable of providing alternative fueling needs to the Department and Community.

Purpose:
Infrastructure will service to provide signficant long term operational savings and reduction/elimination of vehicle emissions.

History & Key Milestones:
Resolution 26043-Motion directing staff to proceed with Phase I of Eco Industrial Park.
Resolution 25639-Approving utilities extension agreement with Mid-Amercian Engery.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed		1,300,000					**1,300,000**
FY2017 Adopted		-					**-**
Change	-	1,300,000	-	-	-	-	**1,300,000**

Operating Impact:

Funding Overview	
Est. Total Project Cost	**1,300,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	
Remaining Need	**1,300,000**

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	
Furniture/Equipment	1,300,000
Other	
Total	**1,300,000**

Funding Source(s): Road Use Reserves

Notes:

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Phase I Public Services Facility

Operational Impact

The information provided includes a fifteen year projected diesel and gasoline fuel costs for the Public Services Department (top two tables) and a fifteen year projected compressed natural gas consumption vs. total projected cost of fuel (bottom two tables).

The fuel analysis was peformed based upon tranporation fuel forecasts provided by the United States Energy Information Adminstration (EIA). Projected fuel consumption is based upon the average fuel usuage over the last ten years within the Department.

NOTE: ESTIMATES BASED UPON ENERGY FORECASTS AND AVERAGE RATE OF FUEL INCREASE WITHIN DEPARTMENT FOR THE LAST TEN YEARS.

NOTE: MAINTENACE ACTIVITY LEVELS WILL IMPACT ACTUAL FUEL USE.

15 YEAR PROJECTED TOTAL DIESEL

YEAR	GALLONS	AVERAGE PRICE GALLON	TOTAL
2018-2019	74000	$2.30	$ 170,200
2019-2020	76280	$2.70	$ 205,956
2020-2021	78560	$3.45	$ 271,032
2021-2022	80840	$3.65	$ 295,066
2022-2023	83120	$3.65	$ 303,388
2023-2024	85400	$3.72	$ 317,688
2024-2025	87,680	$3.79	$ 332,307
2025-2026	89,960	$3.88	$ 349,044
2026-2027	92,240	$4.00	$ 368,960
2027-2028	94,520	$4.12	$ 389,895
2028-2029	96,800	$4.24	$ 410,432
2029-2030	99,080	$4.37	$ 432,979
2030-2031	101,360	$4.50	$ 456,120
2032-2033	103,640	$4.64	$ 480,889
2033-2034	105,920	$4.79	$ 507,356
2034-2035	108,200	$4.94	$ 534,508
	1,457,600		**$ 5,825,820**
	15 YEAR TOTAL DIESEL		**ESTIMATED 15 YEAR DIESEL COST**

15 YEAR PROJECTED TOTAL GASOLINE

YEAR	GALLONS	AVERAGE PRICE GALLON	TOTAL
2018-2019	14,000	$2.00	$ 28,000
2019-2020	14,430	$2.48	$ 35,786
2020-2021	14,860	$3.17	$ 47,106
2021-2022	15,290	$3.36	$ 51,374
2022-2023	15,720	$3.36	$ 52,819
2023-2024	16,150	$3.42	$ 55,233
2024-2025	16,580	$3.49	$ 57,864
2025-2026	17,010	$3.57	$ 60,726
2026-2027	17,440	$3.68	$ 64,179
2027-2028	17,870	$3.79	$ 67,727
2028-2029	18,300	$3.90	$ 71,370
2029-2030	18,730	$4.02	$ 75,295
2030-2031	19,160	$4.14	$ 79,322
2032-2033	19,590	$4.27	$ 83,649
2033-2034	20,020	$4.40	$ 88,088
2034-2035	20,450	$4.54	$ 92,843
	275,600		$ 1,011,383

15 YEAR COMPRESSED NATURAL GAS FUEL ESTIMATES

YEAR	GALLONS	AVERAGE PRICE	TOTAL	
2018-2019	74000	0.3	$ 22,200	
2019-2020	76280	0.31	$ 23,647	
2020-2021	78560	0.32	$ 25,139	
2021-2022	80840	0.33	$ 26,677	
2022-2023	83120	0.34	$ 28,261	
2023-2024	85400	0.35	$ 29,890	
2024-2025	87,680	0.36	$ 31,565	VS
2025-2026	89,960	0.37	$ 33,285	
2026-2027	92,240	0.38	$ 35,051	
2027-2028	94,520	0.39	$ 36,863	
2028-2029	96,800	0.4	$ 37,752	
2029-2030	99,080	0.41	$ 39,632	
2030-2031	101,360	0.42	$ 41,558	
2032-2033	103,640	0.43	$ 43,529	
2033-2034	105,920	0.44	$ 45,546	
2034-2035	108,200	0.45	$ 47,608	
	1457600		**$ 548,202**	
	15 YEAR TOTAL CNG		**ESTIMATED 15 YEAR CNG COST**	

15 YEAR PROJECTED TOTAL DIESEL AND GASOLINE COSTS

YEAR	TOTAL PROJECTED FUEL COSTS
2018-2019	$ 198,200
2019-2020	$ 241,742
2020-2021	$ 318,138
2021-2022	$ 346,440
2022-2023	$ 356,207
2023-2024	$ 372,921
2024-2025	$ 390,171
2025-2026	$ 409,770
2026-2027	$ 433,139
2027-2028	$ 457,622
2028-2029	$ 481,802
2029-2030	$ 508,274
2030-2031	$ 535,442
2032-2033	$ 564,538
2033-2034	$ 595,444
2034-2035	$ 627,351
	$ 6,837,203
	15 YEAR TRANSPORATION FUEL COST

Estimated 15 Year Transportation Fuel Savings

CNG-**$548,202** vs. **$6,837,203** Conventional Fuel

Capital Improvement Program — City Facilities

Eco Industrial Park - Phase I Public Services Facility

Operational Impact

The information provided includes a fifteen year projected diesel and gasoline fuel costs for the Public Services Department (top two tables) and a fifteen year projected compressed natural gas consumption vs. total projected cost of fuel (bottom two tables).

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	15 YEAR TOTAL DIESEL		ESTIMATED 15 YEAR DIESEL COST

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2033-2034	105,920	0.44	$ 45,546
2034-2035	108,200	0.45	$ 47,608
	1457600		$ 548,202
	15 YEAR TOTAL CNG		ESTIMATED 15 YEAR CNG COST

VS

15 YEAR PROJECTED TOTAL DIESEL AND GASOLINE COSTS

YEAR	TOTAL PROJECTED FUEL COSTS
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2020-2021	$ 318,138
2021-2022	$ 346,440
2022-2023	$ 356,207
2023-2024	$ 372,921
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2032-2033	$ 564,538
2033-2034	$ 595,444
2034-2035	$ 627,351
	$ 6,837,203
	15 YEAR TRANSPORATION FUEL COST

MARION Public Services

Estimated 4 Year Engine Maintenance Comparison

4 Year Diesel **$9,724** vs. 4 Year CNG **$4,648**

Capital Improvement Program	Equipment

ECO INDUSTRIAL PARK PHASE I
COMPRESSED NATURAL GAS CHASSIS PROGRAM -FLEET MAINTENANCE

Operational Impact

The information provided below includes a four year comparative maintenance cost analysis of a 2017 model diesel engine vs. a 2017 model natural gas engine from the same manufactuer. Current emission standards require the utilization of tier four diesel engineswith emission engine packages that require significant maintenance.

TOTAL FOUR YEAR MAINTENACE COSTS-DIESEL ENGINE VS. COMPRESSED NATURAL GAS ENGINE -CUMMINS INC. 2017

ENGINE	2017 CUMMINS L9 DIESEL							ENGINE	2017 CUMMINS ISL G NATURAL GAS				
MAINTENACE ITEM	HOURS	MILES	MONTHS	COST	FOUR YEAR			MAINTENACE ITEM	HOURS	MILES	MONTHS	COST	FOUR YEAR
OIL AND FILTER	500	15,000	6	$ 342	$ 2,736			OIL AND FILTER	500	7500	6	$ 342	$ 2,736
FUEL FILTER	500	15,000	6	$ 88	$ 704			FUEL FILTER	1000	15000	12	$ 88	$ 352
COOLANT FILTER	500	15,000	6	$ 62	$ 496			COOLANT FILTER	500	7500	6	$ 62	$ 496
OVERHEAD ADJUSTMENT	5000	150,000	48	$ 536	$ 536			SPARK PLUGS	1500	45000	18	$ 148	$ 394
COOLANT CHANGE	2000	60,000	24	$ 210	$ 420			COOLANT CHANGE	2000	60000	24	$ 210	$ 420
COALESCING FILTER	15000	45,000	18	$ 205	$ 545			VALVE ADJUSTMENT	2000	60000	24	$ 125	$ 250
DEF FILTER	6500	200,000	48	$ 1,488	$ 1,488								$ 4,648
PARTICULATE FILTER	6500	200,000	48	$ 2,800	$ 2,800								
	TOTAL FOUR YEAR MAINTENANCE COST DIESEL				$ 9,725	VS.	$ 4,648	TOTAL FOUR YEAR MAINTENANCE COST CNG					

MARION Public Services

COMPRESSED NATURAL GAS FUELING STATION

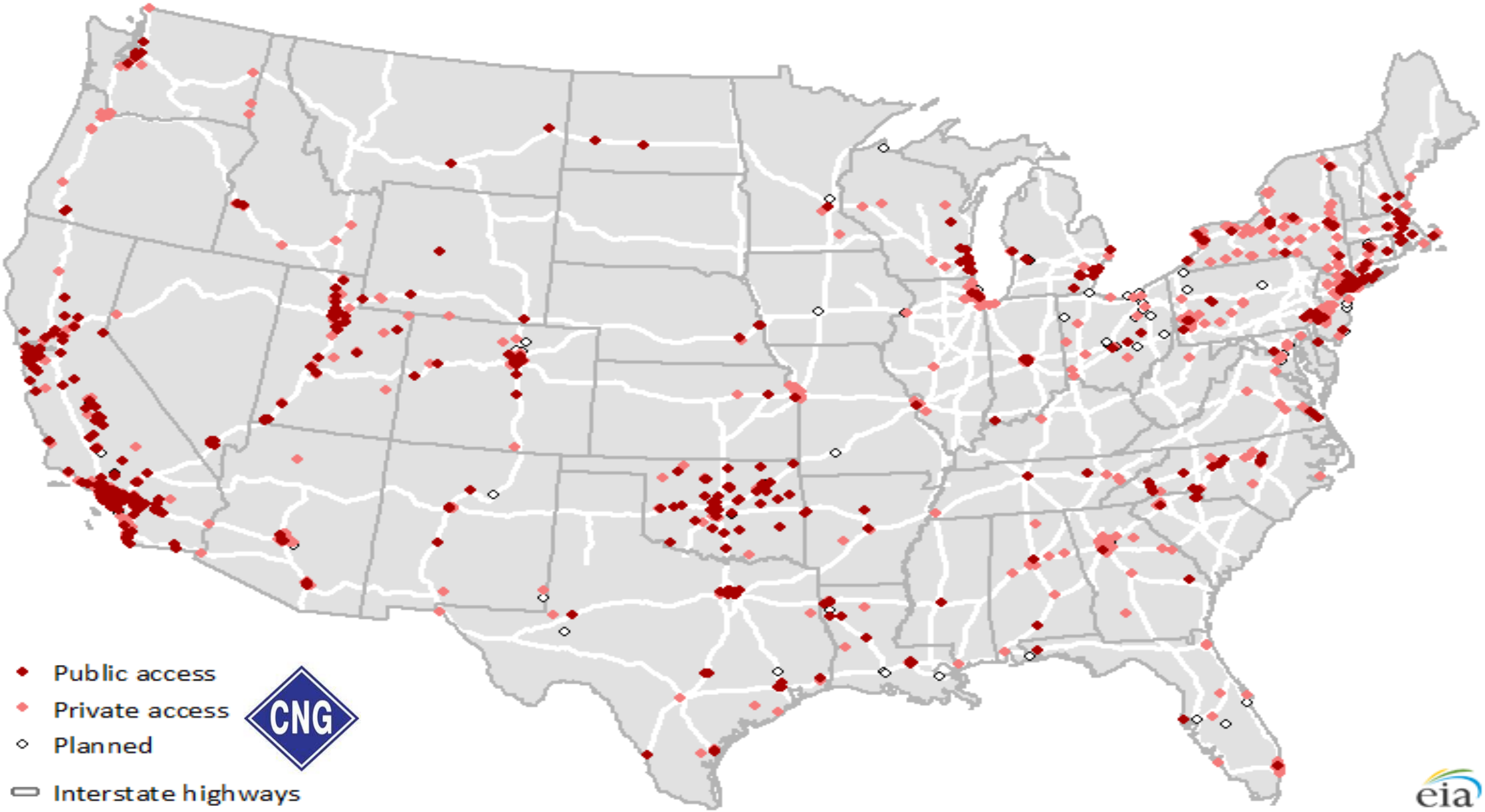
Estimated $2 Million Station Design @ 2800 DGE.

MARION Public Services

COMPRESSED NATURAL GAS FUELING STATION

MARION Public Services

Compressed Natural Gas Fuel Stations



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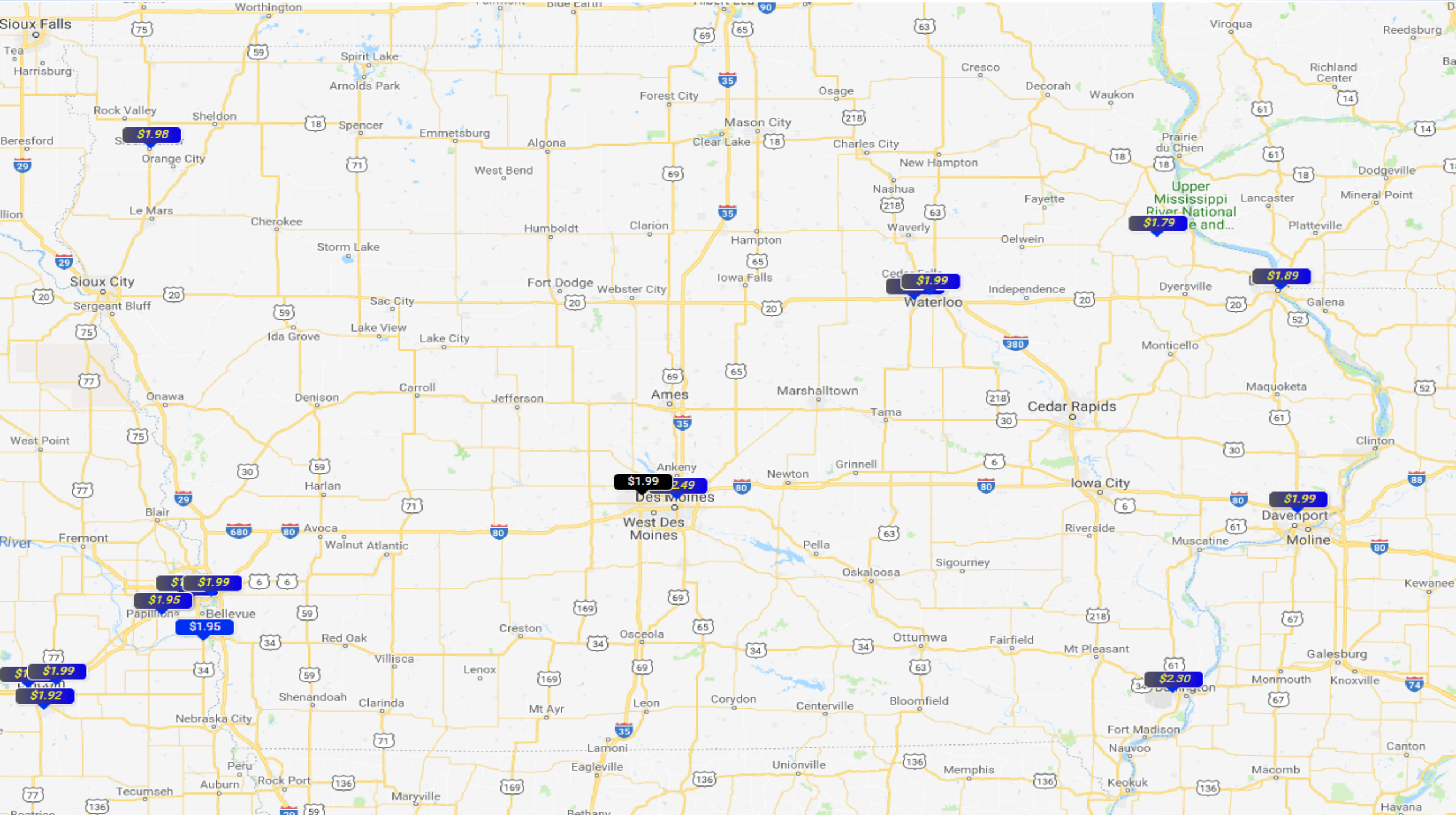
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Sioux City
Orange City
Le Mars
Sergeant Bluff
Cherokee
Storm Lake
Ida Grove
Sac City
Lake View
Lake City
Fort Dodge
Webster City
Humboldt
Clarion
Hampton
Iowa Falls
Ames
Waterloo
Cedar Falls
Independence
Oelwein
Fayette
Waverly
Nashua
New Hampton
Charles City
Mason City
Clear Lake
Forest City
Osage
Algona
West Bend
Emmetsburg
Spencer
Sheldon
Rock Valley
Spirit Lake
Arnolds Park
Worthington
Harrisburg
Tea
Beresford
Onawa
Denison
Carroll
Jefferson
Marshalltown
Tama
Cedar Rapids
Monticello
Dyersville
Dubuque
Galena
Platteville
Lancaster
Mineral Point
Dodgeville
Prairie du Chien
Upper Mississippi River National
Viroqua
Reedsburg
Richland Center
Cresco
Decorah
Waukon
Maquoketa
Clinton
Davenport
Moline
Muscatine
Riverside
Iowa City
Grinnell
Newton
Ankeny
Des Moines
West Des Moines
Harlan
Avoca
Walnut Atlantic
Pella
Oskaloosa
Sigourney
Ottumwa
Fairfield
Mt Pleasant
Kewanee
Galesburg
Monmouth
Knoxville
Fort Madison
Nauvoo
Keokuk
Canton
Macomb
Havana
Memphis
Unionville
Eagleville
Lamoni
Mt Ayr
Leon
Corydon
Centerville
Bloomfield
Osceola
Creston
Lenox
Villisca
Red Oak
Shenandoah
Clarinda
Nebraska City
Peru
Auburn
Rock Port
Tecumseh
Maryville
Blair
Fremont
Papillion
Bellevue
West Point
River

COMPRESSED NATURAL GAS FUELING STATION

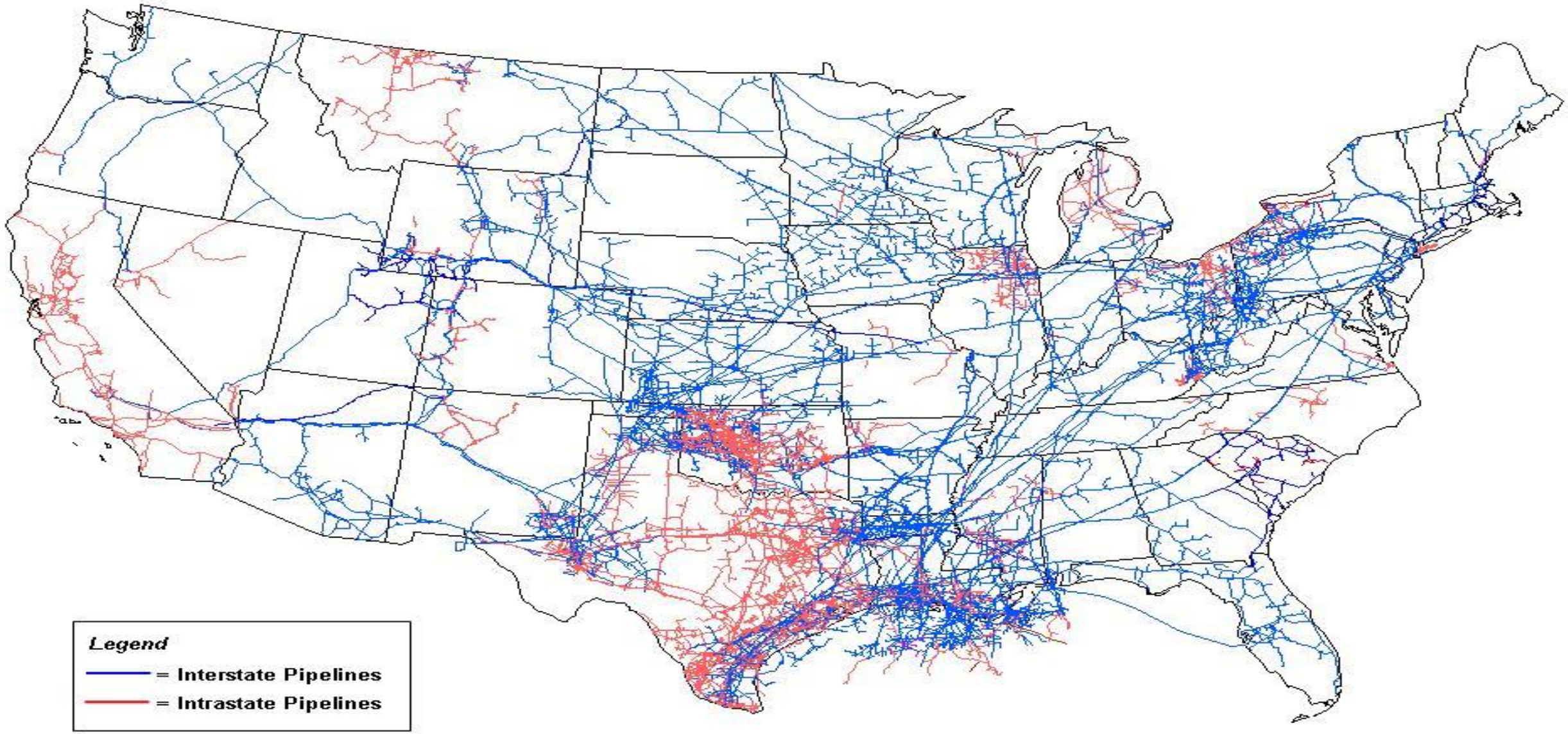
MARION Public Services

COMPRESSED NATURAL GAS FUELING STATION

MARION Public Services

NATURAL GAS INFRASTRUCTURE

MARION Public Services



Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

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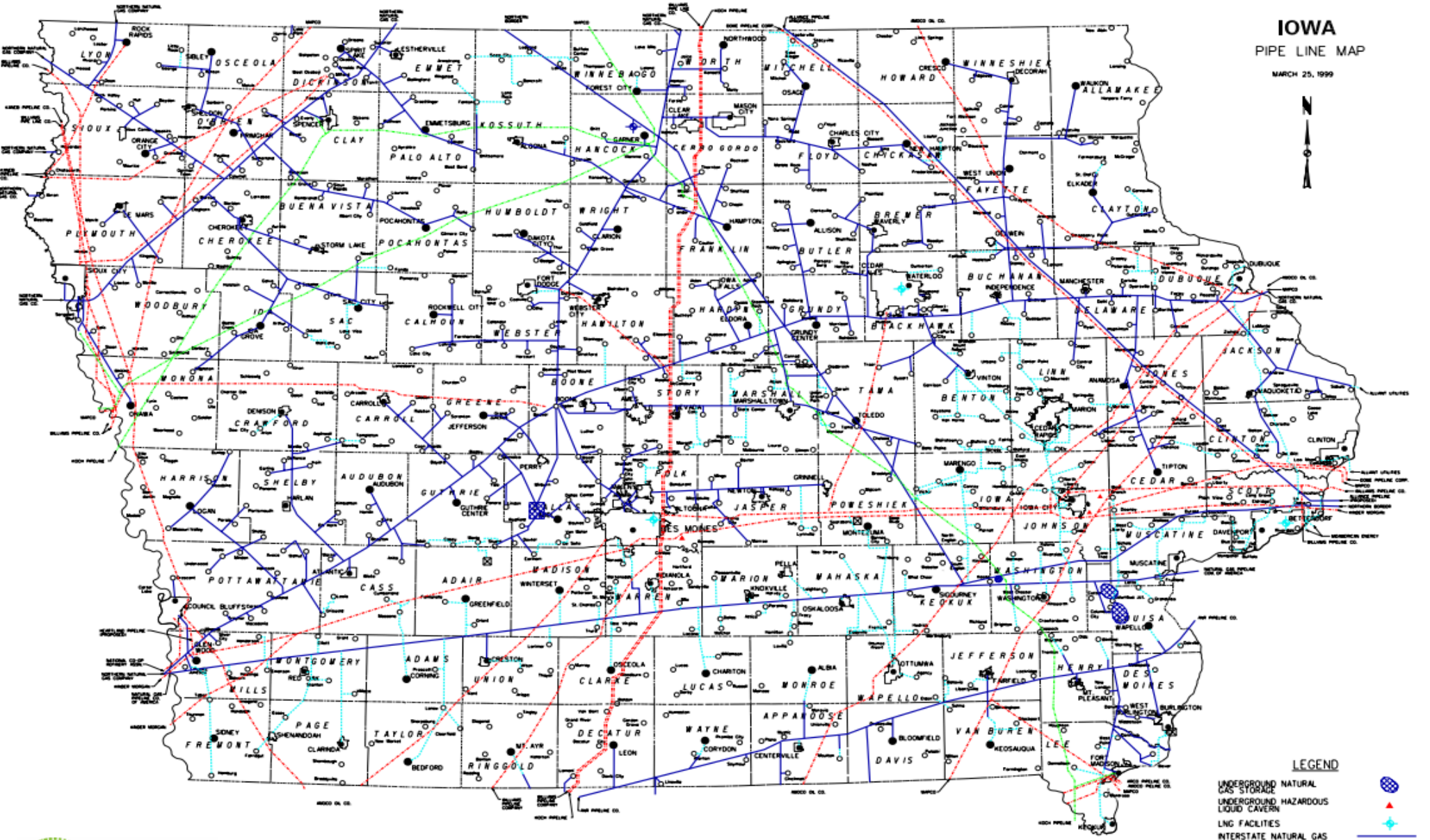
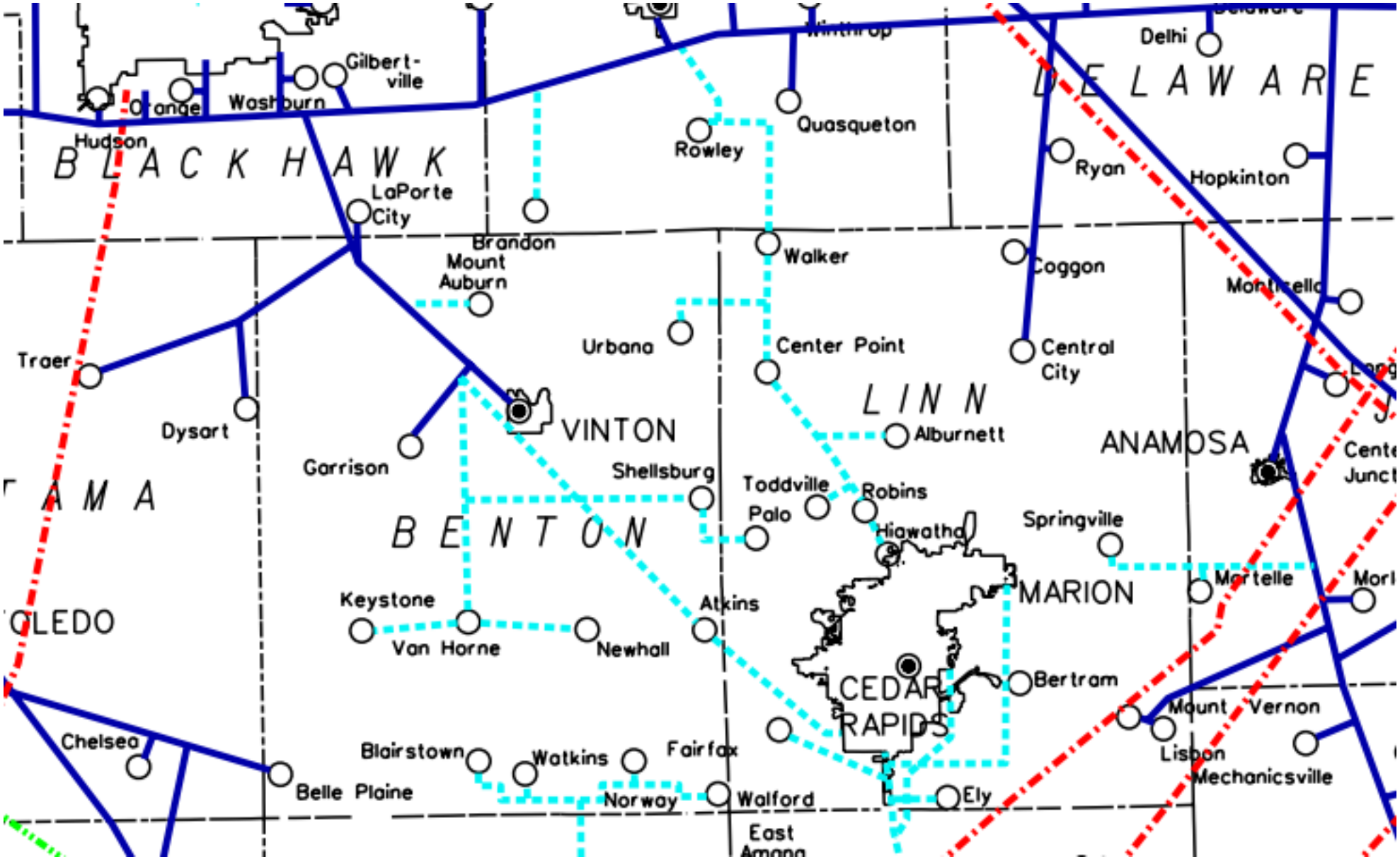


Iowa Utilities Board

MARION Public Services



MARION Public Services

NATURAL GAS INFRASTRUCTURE

Minimum Specifications for Natural Gas Infrastructure:

- Total connected gas load in MMBtu/hr or MCF/hr-6” line at 40 MCF
- Maximum daily requirement in MMBtu/day or MCF/day-600 MCF Day
- Maximum hourly MMBtu/hour or MCF/hour-80-90 MCF per hour max
- Requested delivery pressure PSIG-40-60 psi
- Hours per day/days per week that the facility will be operational- 24/7

MARION Public Services

Sean, Ryan:
Below please find our revised estimates to provide 40 mcfh to the Marion site.

CNG site 8 @ 3rd Ave & 44th St-Marion, IA-**$2,666,425.00**

Pipeline upgrades-June 17th, 2014

NNG has sufficient mainline, branch line, and TBS capacity to serve 40 mcfh of incremental load through the Vinton TBS during the winter months only (November through March). Capacity for the summer months (April through October) is currently constrained. For firm service including April through October, facility modifications will be required at a Level A estimated cost of $2,518,753 (including tax gross-up).

Distribution upgrades:

Option 1: serve from the 60 psig system. Install 1700 feet of 4" plastic along 3rd Ave.
Total, option 1 = $65,103

Option 2: serve from the 145 psig system. Install 2,800 feet of 4" steel on 3rd Ave between 35th and 44th Streets.
Total, option 2 = $147,672

Greg Theis
Business Development Manager
MidAmerican Energy
563-333-8917

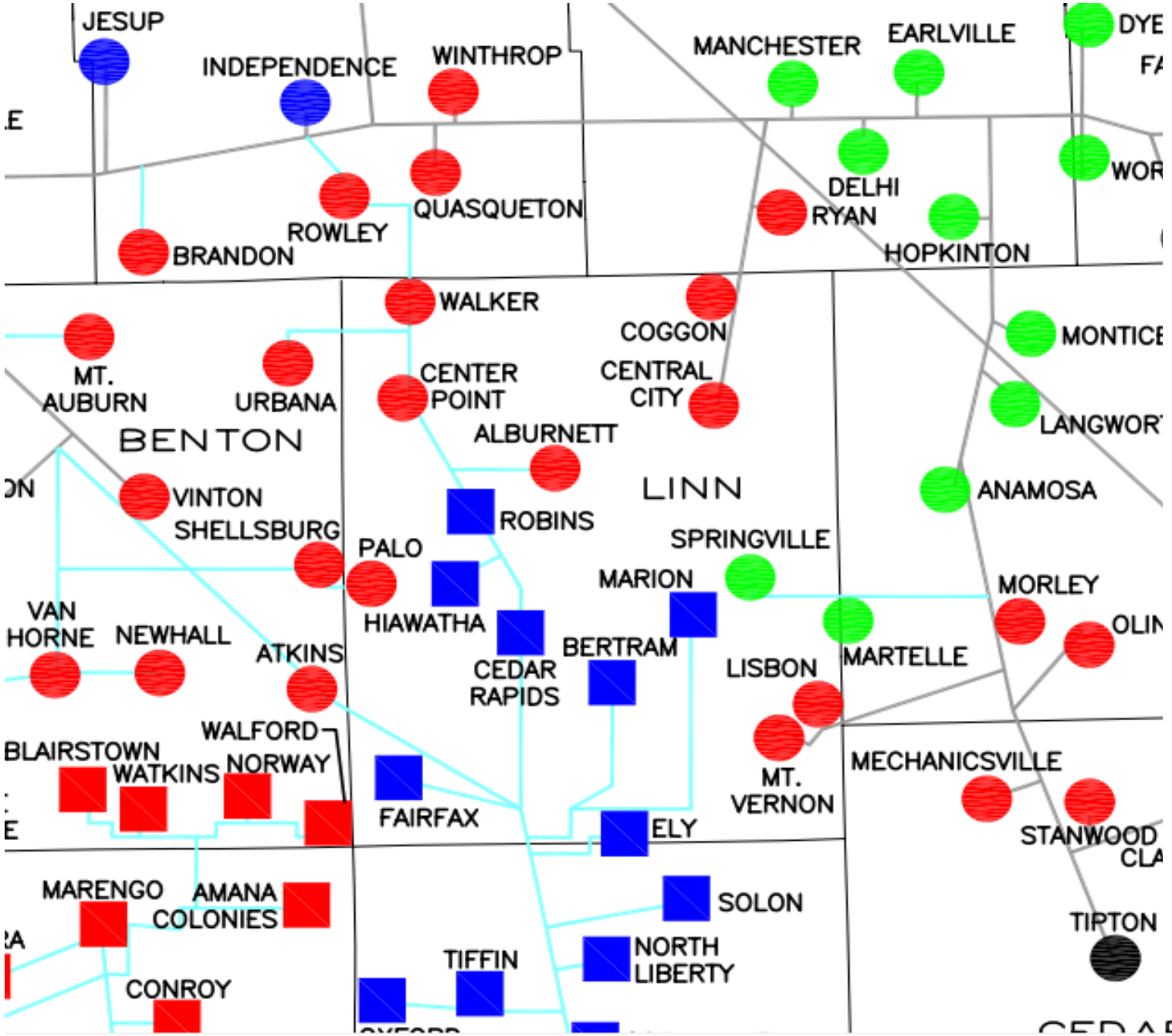
MARION Public Services

NATURAL GAS INFRASTRUCTURE

August 4th, 2016- Motion directing staff to facilitate the establishment of a **natural gas franchise agreement** and related infrastructure improvements with **Black Hills Energy**.

This would allow for an additional natural gas utility to operate within the City of Marion and provide the necessary natural gas loads for the development.

MARION Public Services



INTERSTATE PIPE LINE SUPPLIERS

- Northern Natural Gas Company
- Natural Gas Pipeline Company of America
- ANR Pipe Line Company
- Northern Border Pipeline

INVESTOR OWNED UTILITIES

- Black Hills Energy
- Atmos Energy
- Interstate Power and Light
- MidAmerican Energy

COOPERATIVE OWNED UTILITIES

- Consumers Energy

PRIVATELY OWNED UTILITIES

- Allerton Gas Company

MUNICPALLY OWNED UTILITIES

- Municipal Utility

MARION Public Services

NATURAL GAS INFRASTRUCTURE

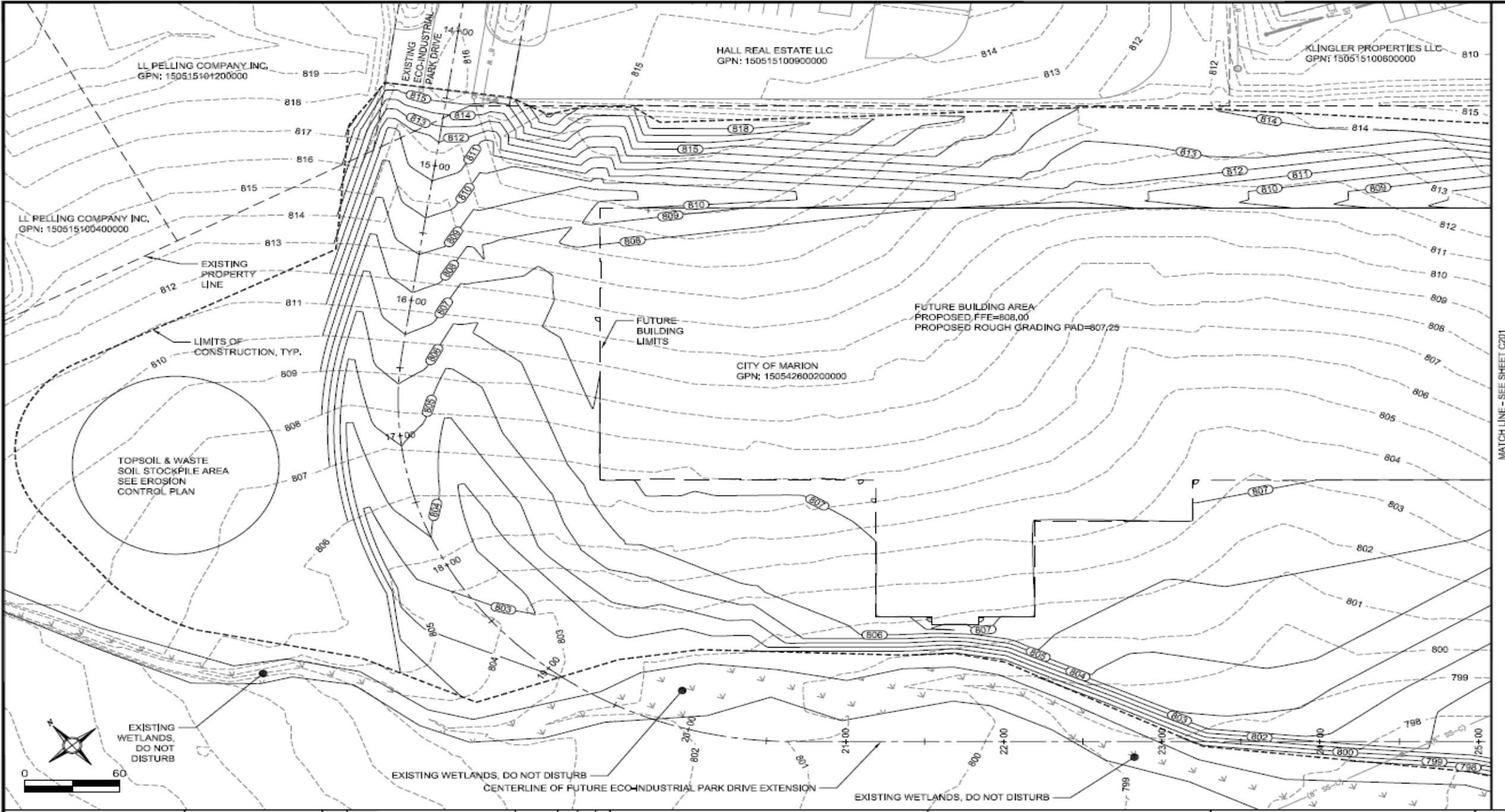
November 3rd, 2016-Resolution No. 25639 approving utilities extension agreement with MidAmerican Energy Company.

The first phase of the Eco Industrial Park programs the utilization of compressed natural gas for vehicles fuels. Upgrades to the natural gas utilities infrastructure were necessary to move forward due to volumes and pressure that would be utilized by the project.

Initial negotiations with Mid American Energy resulted in a price tag of over $2.5 million.

Eventually the approval of the utilities extension agreement with Mid American Energy allowed for the progression of the first phase of the Eco Industrial Park Development to proceed by allowing for improvements to natural gas infrastructure at no cost to the city.

MARION Public Services



ABES PROJECT NO: 313012	DRAWN BY: JAH APPROVED BY: JAH DATE: 03/02/2017	NO. REVISION DESCRIPTION APPROVED DATE	ANDERSON BOGERT	ECO-INDUSTRIAL PARK EARLY GRADING PACKAGE	GRADING PLAN	SHEET NO. C200 OF C201

NATURAL GAS INFRASTRUCTURE

January 12th, 2017 -Resolution No. 25780 directing staff to proceed with the annexation of City owned property located north of Highway 100, on both sides of 44th Street.

January 24th, 2017- Motion to receive and file annexation applications from John and Deborah Hennessey, John Hennessey, Kathleen McCarty, Mary Moran and the Iowa Department of Transportation for property located at Highway 100 and 44th Street.

January 24th, 2017- Motion directing staff to proceed with a 100% voluntary annexation of properties located along Highway 100 and 44th Street (John and Deborah Hennessey, John Hennessey, Kathleen McCarty, Mary Moran, the Iowa Department of Transportation and City of Marion).

January 24th, 2017- Resolution No. 25802 setting public hearing for Februarv 23. 2017 regarding the annexation of properties located along Highway 100 and 4 Street.

MARION Public Services

NATURAL GAS INFRASTRUCTURE

February 23rd, 2017 - Public Hearing regarding voluntary annexation of properties located north of Highway 100 and adjacent to 44th Street (John and Deborah Hennessey, John Hennessey, Kathleen McCarty, Mary Moran, the Iowa Department of Transportation and the City of Marion).

February 23rd, 2017 -Resolution No. 25846 approving the annexation of properties located north of Highway 100 and adjacent to 44th Street.

February 2017-Finalized preliminary plats and site plans for the Eco Industrial Park. Submitted to Planning and Zoning for review.

MARION Public Services

NATURAL GAS INFRASTRUCTURE

May 18th, 2017- Public hearing regarding a request to rezone property from Linn County A and A-1, Rural Restricted to I-2, General Industrial, for property located west and east of 44th Street and south of 3rd Avenue in Marion, Linn County, Iowa. (City of Marion, Eco-Industrial Park Phase 2).

May 18th, 2017-Ordinance No. 17-15 amending the Marion Code of Ordinances regarding a request to rezone property from Linn County A and A-1, Rural Restricted to I-2, General Industrial, for property located west and east of 44th Street and south of 3rd Avenue in Marion, Linn County, Iowa (City of Marion, Eco-Industrial Park Phase 2). Initial consideration.

May 18th, 2017 - Resolution No. 26043 supporting and directing staff to proceed with Phase 1 of the Eco Industrial Park Development.

May 18th, 2017 -Resolution No. 26044 approving an Engagement Letter and Addendum with Piper Jaffray for the Eco Industrial Park.

May 18th, 2017 -Motion directing staff to solicit bids for grading and utility installations for the Eco Industrial Park Development.

MARION Public Services

NATURAL GAS INFRASTRUCTURE

June 8th, 2017- Ordinance No. 17-15 amending the Marion Code of Ordinances regarding a request to rezone property from Linn County A and A-1, Rural Restricted to I-2, General Industrial, for property located west and east of 44th Street and south of 3rd Avenue in Marion, Linn County, Iowa (City of Marion, Eco-Industrial Park Phase 2). Second consideration and Third Consideration.

June 2017- Finalized site plans and solicited bids for grading package.

July 20th, 2017- Resolution No. 26186 setting a public hearing for August 3, 2017 regarding the Eco Industrial Park Grading Project.

August 3rd, 2017- Public Hearing regarding the Eco Industrial Park Grading Project.

August 3rd, 2017- Resolution No. 26256 accepting bids and awarding contract to Rathje Construction for the Eco Industrial Park Grading Project in the amount of $140,943.50.

MARION Public Services

NATURAL GAS INFRASTRUCTURE

MARION Public Services

COMPRESSED NATURAL GAS CHASSIS PROGRAM

MARION Public Services

2007 Clean Air Act (42 U.S.C. § 7401) - United States federal law designed to control air pollution on a national level.

Before 2015, diesel fuel sold in the United States contained high quantities of sulfur. Sulfur in diesel fuel produces air pollution emissions that are harmful to human health. In 2006, the U.S. Environmental Protection Agency issued requirements for the reduction of the sulfur content of diesel fuel.

Covered Fuel-use Category	Before 2006	2006	2007-2009	2010-2011	2012
National					
Highway	500 ppm	15 ppm	15 ppm	15 ppm	15 ppm
Non-Road	HS	HS	500 ppm	15 ppm	15 ppm
Locomotive/Marine	HS	HS	500 ppm	500 ppm	15 ppm

MARION Public Services

NATURAL GAS, THE CLEAN, SIMPLE & RELIABLE ENGINE PLATFORM OF THE FUTURE

Tier 2

- Advanced Engine Controller
- Exhaust Gas Recirculation
- High Pressure Rail Fuel

VS

Tier 4

- Exhaust Gas Recirculation
- DEF & storage tanks
- Diesel Particulate Filtration
- Selective Catalytic Reduction
- Diesel Oxidation Catalyst
- Variable Geometry Turbo
- Multiple EGT, MAT, MAF & MAP sensors

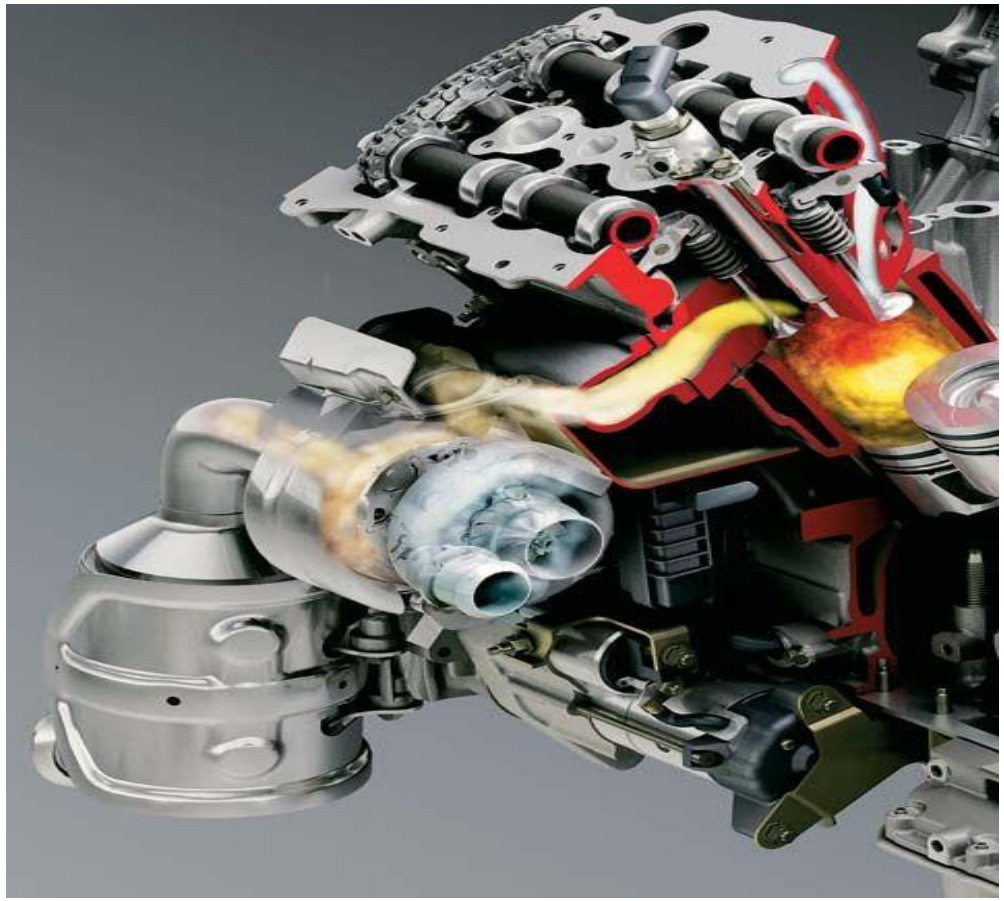
OR

Natural Gas

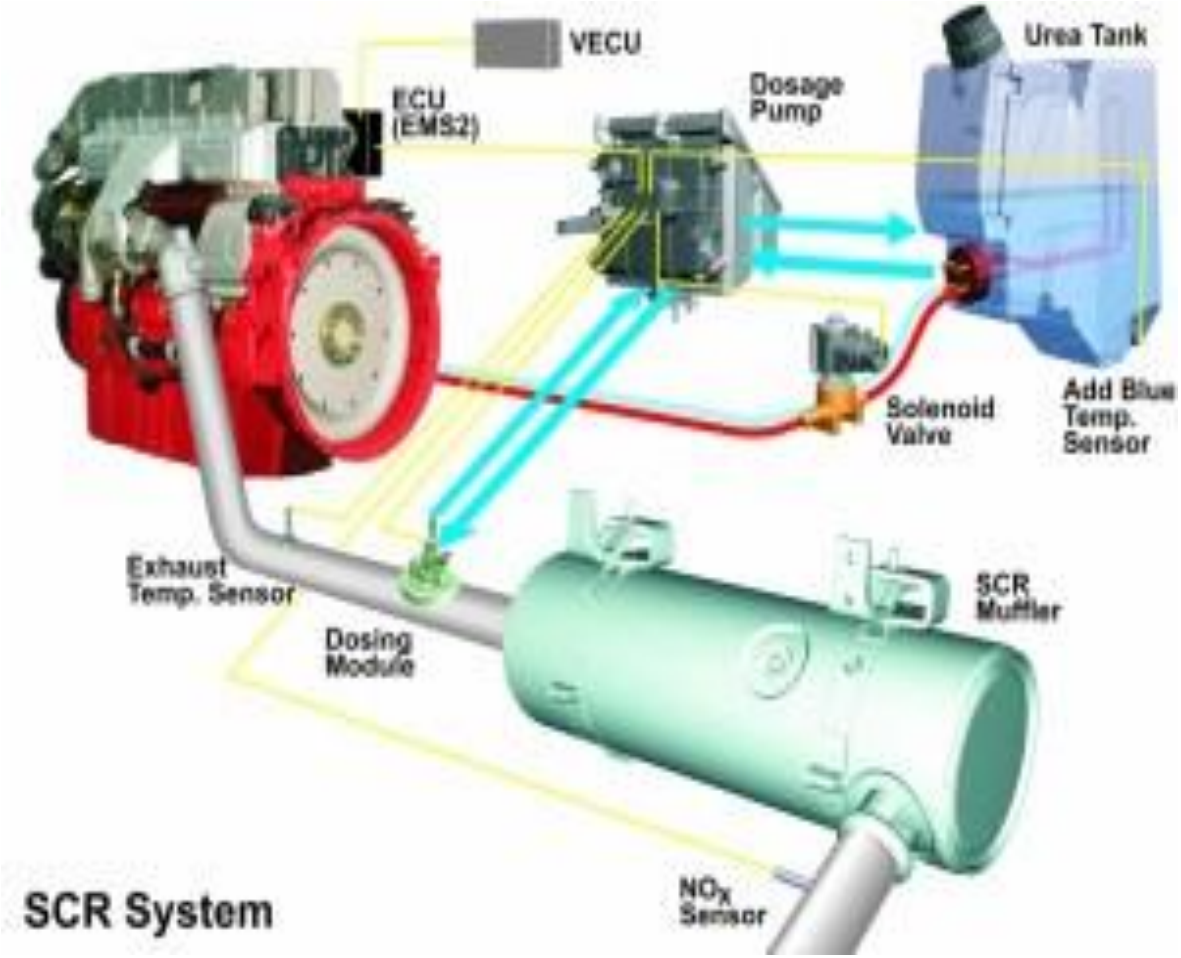
- Basic Air Fuel Ratio Controller
- Standard 3 Way Catalyst

Best of all!

- NO - DEF or storage tanks
- NO - EGR, DPF, SCR, DOC, VGT or complex computer electronics



EGR Technology



MARION Public Services

CNG STUDY-DEMONSTRATION

In August of 2013, the Public Services Department two Ford F-350 pickups to a bi-fuel engine designed that had the ability to run on compressed natural gas and/or propane with conventional fuel.

The vehicles are currently operating on both fuel systems to date. The average price per gallon for compressed natural gas is roughly $.19 per gallon.

The calculated payback for the entire demonstration project was just under ten months.

MIDWEST ENERGY SOLUTIONS

MARION Public Services

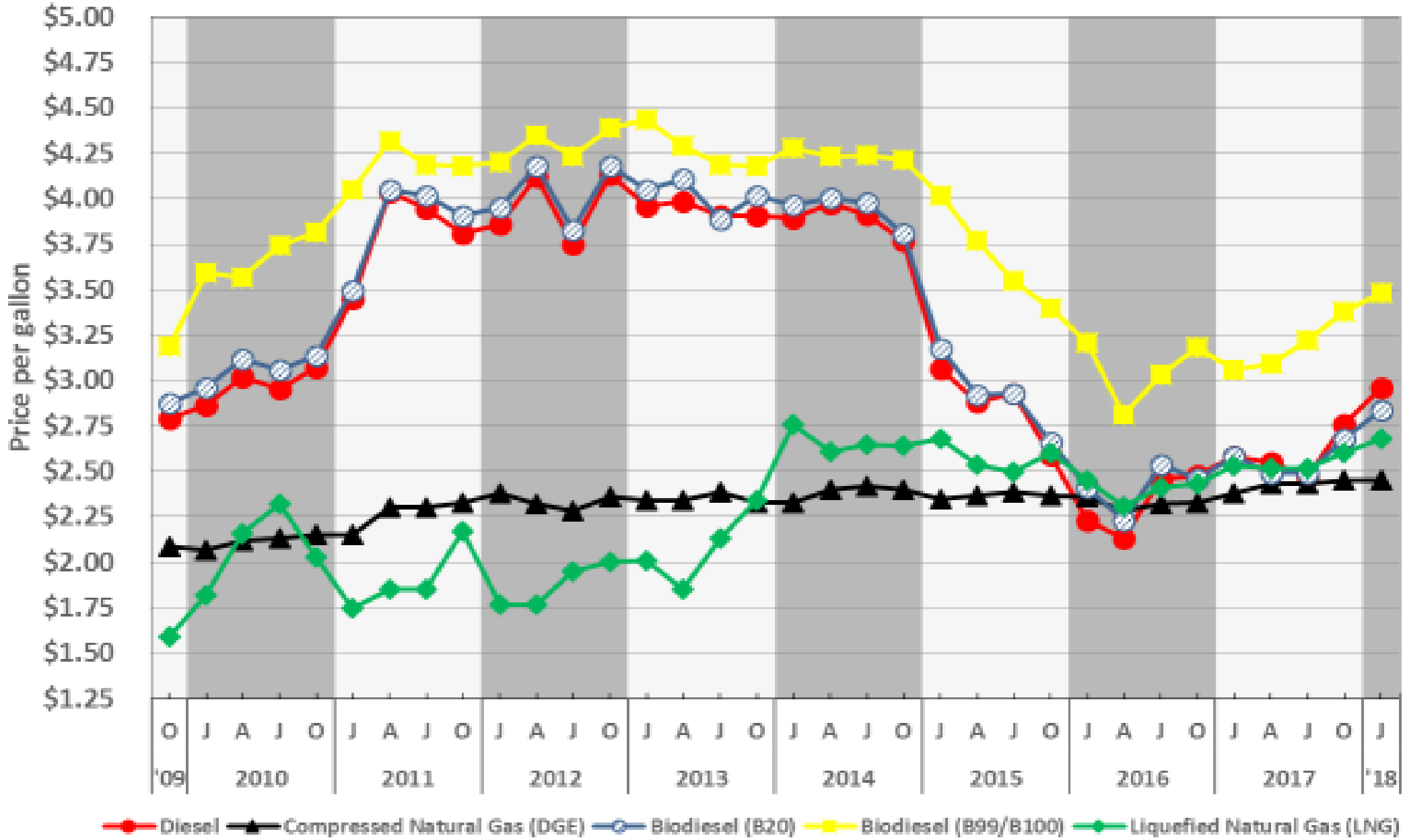


FIGURE 17
ALTERNATIVE FUEL PRICES VERSUS DIESEL

COMPRESSED NATURAL GAS CHASSIS

WIDESPREAD IN FLEET MARKET

60% OF ALL REFUSE TRUCKS MFG ARE COMPRESSED NATURAL GAS.

7 YEAR UNLIMITED MILE WARRANTY OPTIONS

MARION Public Services

Cummins Westport

First Mid Range engine in North America to receive emissions certifications from the U.S. Environmental Protection Agency (EPA) and the Air Resources Board (ARB) in California for meeting the 0.02 g/bhp-hr optional Near Zero NOx Emissions standard.

POTENTIAL TO OFFSET 98% -99% OF TOTAL EMISSIONS

MARION Public Services

Dublin, Ohio-CNG
Snowplows

Dane County, WI-
75 CNG Snowplows

MARION
Public Services

FAQ's

Q: Is Compressed Natural Gas (CNG) safe?

A: Yes.

Natural Gas is a very safe fuel and is used by millions of Americans every day. CNG has a higher ignition point combined with a narrow flammability range making it safer relative to gasoline. If a CNG leak exists, the gas, being lighter than air, will dissipate into the atmosphere, quickly eliminating the threat of combustion.

Q: What Natural Gas Vehicles (NGVs) are available?

A. Conversion kits can be purchased and installed by our expert team of mechanics for any size, make or model of vehicles. Alternatively, the Honda Civic GX is a dedicated CNG vehicle which may be purchased through Honda Dealerships.

Q. Are Natural Gas Vehicles Safe?

A. Yes.

NGVs are inspected and held to the same safety and fire protection standards as gasoline or diesel powered vehicles.

KWIK TRIP
POWERED BY NATURAL GAS

Kwik Trip, Inc.
1-608-781-8988
1626 Oak Street P.O. Box 2107
La Crosse, WI 54602-2107

www.ktbeyondgreen.com
ktbeyondgreen@kwiktrip.com

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POWERED BY NATURAL GAS

PRESERVING OUR PLANET & CREATING ENERGY INDEPENDENCE FOR OUR NATION


KWIK TRIP
CNG 1.79
2.64
DIESEL 2.54
PREMIUM DIESEL 2.57
B5 BIO-DIESEL 2.63
B20 BIO-DIESEL 2.74
OFF-ROAD DIESEL 2.14
DEF 2.79
PROPANE 2.99
UNLEADED 2.39
PUBLIC WELCOME

OPERATIONAL BENEFITS COMPRESSED NATRUAL GAS CHASSIS

1. Uniform Fleet Profile provides savings for total cost ownership.

2. Acquisition model allows for ability to extend replacement schedules.

3. Avoid maintenance expenses associated with Tier 4 Diesel Engines.

4. Implementation of Emission Free fleet.

5. Opportunity to incorporate multiple service applications on one chassis

6. Avoid costs typically associated with conventional dealer purchases

7. Take immediate advantage of energy and cost savings.

MARION Public Services

Capital Improvement Program

City Equipment

CNG Fleet-ROAD USE

Project Information

Category: City Equipment
Department: Public Services
Priority:
Fund: 110 - Road Use Fund
111 - Road Use Replacement

Est. Completion Date: 2019-2021
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	

Description & Scope:
Integeration of fleet that will utilize compressed natural gas as primary transporation fuel.

Purpose:
Provides signficant long term cost savings and reduction/elimination of vehicle emissions. Additional cost savings realized with vehicle maintenance.

History & Key Milestones:
City Counicl Resolution 26043-Motion directing staff to proceed with Phase I of Eco Industrial Park.
City Council Resoltuion 26044-Approving Enganagement Letter and Placement Agreemnent with Piper Jaffray.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed		2,975,000	970,000				**3,945,000**
FY2017 Adopted		-					**-**
Change	-	2,975,000	970,000	-	-	-	**3,945,000**

Operating Impact:

Funding Overview	
Est. Total Project Cost	**3,945,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	
Remaining Need	**3,945,000**

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	
Furniture/Equipment	3,945,000
Other	
Total	**3,945,000**

Funding Source(s): Road Use Replacement and Road Use Reserves

Notes:

MARION Public Services

Capital Improvement Program | **Equipment**

ECO INDUSTRIAL PARK PHASE I
COMPRESSED NATURAL GAS CHASSIS PROGRAM
ROAD USE

Fiscal Impact

Information contained below includes the proposed transition to a compressed natural gas fleet. For the past six years, the Public Services Department has postponed the scheduled replacement of the current fleet in anticipation of converting the compressed natural gas platform.

It is proposed that the fleet procurment will be finananced with current fund balances in Road Use and Road Use Replacement Funds.
The current fleet replacement model will allow for alternative purcahsing models and provide for a uniform fleet profile.

YEAR ONE PUBLIC SERVICES		COMPRESSED NATURAL GAS CHASSIS PROFILE				HEAVY DUTY	CAPITAL OUTLAY
Division	Chassis		YEAR PURCHASED	LIFE CYCLE	CHASSIS SPEC	ENG SPEC	
111 Road Use	2001 Intl 2 1/2 Dump #56	92500	Sep-00	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2002 Sterling 2 1/2T Dump #53	72000	Dec-01	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2003 Sterling L7500 Dump #57	76100	Dec-02	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2004 Sterling L7500 Dump #58			12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2005 Sterling 2 1/2 t. Dump #52	88000	1/1/2005	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2006 Sterling 2 1/2 ton #51	97,000	Dec-05	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2007 International tandem #50	120,230	Dec-06	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2009 Intl 7400 Tandem Dump #55	116,340	Oct-08	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2009 Intl 7400 Tandem Dump #59	120000	Oct-09	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	2011 Intl 7400 Tandem Dump #60		Feb-12	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	1996 Ford LN8000 tandem #54	63,056	Jun-05	12	CLASS 7	8.9L CNG	$ 225,000
111 Road Use	Tymco 600 Sweeper #32	162,880.00	2012	12	CLASS 6	8.9L CNG	$ 365,000
111 Road Use	Tymco 600 Sweeper #33	162,880.00	2012	12	CLASS 6	8.9L CNG	$ 365,000
111 Road Use	1990 Ford E350 Van #8 (Painter)	65855	1990	12	CLASS 6	8.9L CNG	$ 250,000
111 Road Use	2005 Ford F-350 boom truck #7	75,000	Feb-06	12	CLASS 6/7	8.9L CNG	$ 150,000
						TOTAL	**$ 3,605,000**
						TRADE IN VALUE	**$ 630,000**
						AQCUISITION TOTAL	**$ 2,975,000**
					BUY DOWN ROAD USE REPLACMENT		**$ 1,500,000**
					BUY DOWN ROAD USE RESERVES		**$ 1,475,000**

YEAR TWO PUBLIC SERVICES		COMPRESSED NATURAL GAS CHASSIS PROFILE				MEDIUM DUTY	CAPITAL OUTLAY
Division	Chassis		YEAR PURCHASED	LIFE CYCLE	CHASSIS SPEC	ENG SPEC	
111 Road Use	2007 Ford F-250 w/ plow/lift #40	34,135	Aug-06	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	2009 F350 1 Ton Dump Truck #41	39,433	Oct-08	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	2006 Ford F-350 1 ton w/plow #49	33,372	Dec-05	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	1998 Dodge 4x4 w plow #39	20338	Jul-98	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	2003 Ford F-350 w/ utility box #42	30400	12/2/2002	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	2004 Ford F350 w util box #45	32,895	9/1/2003	12	CLASS 6/7	8.9L CNG	$ 150,000
111 Road Use	2005 Chev 1 t Dump w/ plpow #46	33000	10/1/2004	12	CLASS 6/7	8.9L CNG	$ 150,000
						TOTAL	**$ 1,050,000**
						TRADE IN VALUE	**$ 80,000**
						AQCUISITION TOTAL	**$ 970,000**
					BUY DOWN ROAD USE RESERVES		**$ 970,000**

Capital Improvement Program

City Equipment

CNG Fleet-Sanitary Sewer

Project Information

Category: City Equipment
Department: Public Services
Priority:
Fund: 615 - Sanitary Sewer Replacement

Est. Completion Date:
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	

Description & Scope:
Integeration of fleet that will utilize compressed natural gas as primary transportation fuel.

Purpose:
Provides signficant long term cost savings and reduction/elimination of vehicle emissions. Additional cost savings realized with vehicle maintenance.

History & Key Milestones:
City Counicl Resolution 26043-Motion directing staff to proceed with Phase I of Eco Industrial Park.
City Council Resoltuion 26044-Approving Engagement Letter and Placement Agreemnent with Piper Jaffray.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed		362,500	362,500				**725,000**
FY2017 Adopted		-					**-**
Change	-	362,500	362,500	-	-	-	**725,000**

Operating Impact:

Funding Overview	
Est. Total Project Cost	**725,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	
Remaining Need	**725,000**

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	
Furniture/Equipment	725,000
Other	
Total	**725,000**

Funding Source(s): SANITARY SEWER REPLACEMENT

Notes:

MARION Public Services

Capital Improvement Program | **Equipment**

ECO INDUSTRIAL PARK PHASE I
COMPRESSED NATURAL GAS CHASSIS PROGRAM
SANITARY SEWER

Operational Impact

Information contained below includes the proposed transition to a compressed natural gas fleet.

For the past six years, the Public Services Department has postponed the scheduled replacement of the current fleet in anticipation of converting the compressed natural gas platform.

It is currenlty proposed that the fleet aqcuisition will be finananced with current fund balances in the Sanitary Replacement fund. The current fleet replacement model will allow for alternative acquision models to be pursued and provide for a uniform fleet profile.

YEAR 1 PUBLIC SERVICES	COMPRESSED NATURAL GAS CHASSIS PROFILE					HEAVY DUTY	CAPTIAL OUTLAY	
Division	Chassis		YEAR PURCHASED	LIFE CYCLE	CHASSIS SPEC	ENG SPEC		
610 Sanitary Sewer	2002 Dodge 3500 #47	29,000	12/1/2001	12	CLASS 6/7	8.9L CNG	$ 175,000	
610 Sanitary Sewer	2006 Chevy 1 ton w/plow #48	32,000	Nov-05	12	CLASS 6/7	8.9L CNG	$ 175,000	
610 Sanitary Sewer	1996 Ford D 350 #16 Van	75,900	1996	12	CLASS 6/7	8.9L CNG	$ 200,000	
610 Sanitary Sewer	2009 Ford F350 w/ service box #43	34,100	Oct-08	12	CLASS 6/7	8.9L CNG	$ 175,000	
							$ 725,000	AQCUISITION TOTAL

MARION Public Services

Capital Improvement Program

City Equipment

CNG Fleet/Automated Collections-Solid Waste

Project Information

Category: City Equipment
Department: Public Services
Priority:
Fund: 675 - Solid Waste Replacement

Est. Completion Date: Fall 2019
Project Number:

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	

Description & Scope:
Integeration of fleet that will utilize compressed natural gas as primary transporation fuel. Integration of automated curbside collections program to include leaf collection

Purpose:
Provides signficant long term cost savings for tranporation fuels and curbside refuse collections. Increased level of service to the community.

History & Key Milestones:
City Counicl Resolution 26043-Motion directing staff to proceed with Phase I of Eco Industrial Park.
City Council Resoltuion 26044-Approving Enganagement Letter and Placement Agreemnent with Piper Jaffray.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed		4,400,000					**4,400,000**
FY2017 Adopted		-					-
Change	-	4,400,000	-	-	-	-	**4,400,000**

FUNDING SOURCES: As currently proposed, financing for procurement would be provided by Solid Replacement and a Solid Waste Revenue Bond.
Solid Waste Replacement -$700,000
Solid Waste Revenue Bond-$3,700,000

Annual bond payments would result in a projected increase in monthly solid waste fees by $2.50 to $3.50 per month.

Operating Impact:

Funding Overview	
Est. Total Project Cost	**4,400,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	
Remaining Need	**4,400,000**

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	
Furniture/Equipment	4,400,000
Other	
Total	**4,400,000**

Funding Source(s): Solid Waste Replacement-Solid Waste Revenue Bond

Notes:

MARION Public Services

MARION Public Services

CITY OF MARION
SOLID WASTE COLLECTIONS

MANUAL COLLECTIONS-EACH DRIVER COLLECTS UPWARD OF 500 DWELLINGS PER DAY (5-7 TONS OF MATERIAL

FIVE TO SEVEN DEDICATED ROUTES ARE PROGRAMMED FOR EACH COLLECTION DAY.

APPROVAL RATING OF 80% TO 90%

MARION Public Services

CONSISTENT REQUEST FOR LARGE CITY ISSUED WHEELED CONTAINERS FOR COLLECTIONS

MARION Public Services

ALTERNATIVE APPROACH TO RECYCLING

"MIXED BIN COLLECTION PROGRAM"

Increased Efficiencies In Collections

Improve Services To Residents

Opportunity To Increase Recycling Rate and Meet Solid Waste Management Objectives- "Zero Waste"

MARION Public Services

Enforcement

Volkswagen Clean Air Act Civil Settlement

(Washington, D.C.) - Through a series of three partial settlements, the EPA has resolved a civil enforcement case against Volkswagen AG, Audi AG, Dr. Ing. h.c. F. Porsche AG, Volkswagen Group of America, Inc., Volkswagen Group of America Chattanooga Operations, LLC, and Porsche Cars North America, Inc. (collectively "Volkswagen"), subject to reservations set forth in each of the partial settlements. First, on June 28, 2016, the United States lodged with the United States District Court for the District of Northern California the first partial settlement with certain of these Volkswagen entities addressing vehicles containing 2.0 liter diesel engines (the "2.0 liter partial settlement"). On October 25, 2016, the court approved the 2.0 liter partial settlement. Second, on December 20, 2016, the United States lodged with the court the second partial settlement with Volkswagen addressing vehicles containing 3.0 liter diesel engines (the "3.0 liter partial settlement"). On May 17, 2017, the court approved the 3.0 liter partial settlement. Third, on January 11, 2017, the United States lodged with the court the third partial settlement with Volkswagen addressing civil penalties and injunctive relief to prevent future violations (the "third partial settlement"). On April 13, 2017, the court approved the third partial settlement.

Settlement Resources

- 01/11/17 - Reference News Release
- 12/20/16 - Reference News Release
- 06/28/16 - Reference News Release
- Related Consent Decrees
- Amended Complaint
- Environmental Mitigation Trust Agreements
- FAQs: Beneficiaries to the VW Mitigation Trust
- FAQs: Zero Emission Vehicle Investment
- Appointment of Trustee
- EPA approved National ZEV Investment Plan (Public Version)

STATE OF IOWA

VOLKSWAGEN CLEAN AIR ACT PARTIAL SETTLEMENTS

IOWA'S BENEFICIARY MITIGATION PLAN

The state of Iowa must submit a Beneficiary Mitigation Plan no later than 30 days prior to submitting its first funding request. This plan summarizes how the state plans to use the mitigation funds allocated to it under the environmental mitigation trust. Beneficiaries may only use their allocation for eligible nitrogen oxides reduction projects and for eligible administrative expenditures.

Iowa has completed a draft plan and it's available for public review. The draft plan outlines how Iowa intends to use VW funds to positively impact air quality by reducing NOx emissions. Comments on the plan will be accepted through Friday, May 25, 2018. Your comments may be incorporated into the final version before submitting the plan to the trustee.

MITIGATION PLAN REQUIREMENTS

1. The plan must be submitted no later than 30 days prior to submitting its first funding request.
2. The plan is intended to provide the public with insight into the high-level vision for use of the funds

ELIGIBLE NITROGEN OXIDES REDUCTION PROJECTS

Click on the boxes below to view more information about each project.

- Class 8 local freight or port drayage trucks (large trucks)
- Class 4-7 local freight (medium trucks)

MITIGATION PLAN REQUIREMENTS

1. The plan must be submitted no later than 30 days prior to submitting its first funding request.
2. The plan is intended to provide the public with insight into the high-level vision for use of the funds.
3. The plan shall explain the process by which the beneficiary shall seek and consider public input on its plan.
4. The plan must list the eligible mitigation actions selected to achieve the goals and the percentage of funds to be used for each action.
5. The plan must include a description of how the beneficiary will consider the potential beneficial impact of the selected actions on air quality in areas that bear a disproportionate share of air pollution burden.
6. The plan also needs to contain a general description of the expected ranges of emissions benefits realized by the implementation of the selected actions identified in the plan.
7. The plan needs to contain only the level of detail "reasonably ascertainable" at the time of submission.
8. The plan is not intended to be binding and can be adjusted by the beneficiary.

ELIGIBLE NITROGEN OXIDES REDUCTION PROJECTS

Click on the boxes below to view more information about each project.

> Class 8 local freight or port drayage trucks (large trucks)

Class 4-7 local freight (medium trucks)

- Includes 1992-2009 model years (may include 2010-2012 models if state already requires).
- Eligible medium trucks must be scrapped.
- Government-owned: All options up to 100 percent funded.
- Nongovernment owned: Variable fund percentages based on mitigation
  - New diesel or alternative fuel engine (e.g., natural gas, propane, hybrid) vehicle.
    - Repower: Up to 40 percent funded.
    - Purchase new = up to 25 percent funded
  - All-electric engine: Includes infrastructure.
    - Repower: Up to 75 percent funded.
    - Purchase new: Up to 75 percent funded.

> Class 4-8 school, shuttle, or transit buses

> Freight switchers (pre-Tier 4 switcher locomotives that operate 1,000 or more hours per year)

> Ferries/Tugs (unregulated, Tier 1 or Tier 2 marine engines)

> Ocean going vessel (OGV) shore power

ECO INDUSTRIAL PHASE II
RETAIL FUELING STATION

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Phase II Retail Fueling Center

Project Information

Category: City Facilities
Department: Public Services
Priority:
Fund: 110 - Road Use Fund
610 - Sanitary Sewer
670 - Solid Waste

Est. Completion Date: TBD
Project Number: 110 000001

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	X

Description & Scope:
Cosntruction of retail fuels station and bulk fuel terminal that includes integration of alternative fuels.

Purpose:
Construction of retail fueling and bulk fuel terminal to provide long term cost savings to the City of Marion.

History & Key Milestones:
Resolution No.

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed		2,700,000					
FY2017 Adopted							-
Change	-	2,700,000	-	-	-	-	-

Operating Impact:

Funding Overview	
Est. Total Project Cost	
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	-
Remaining Need	-

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	2,700,000
Furniture/Equipment	
Other	
Total	**2,700,000**

Funding Source(s): Revenue Bond

Notes:

MARION Public Services

Eco Industrial Park Phase II-Retail Fueling Facilities

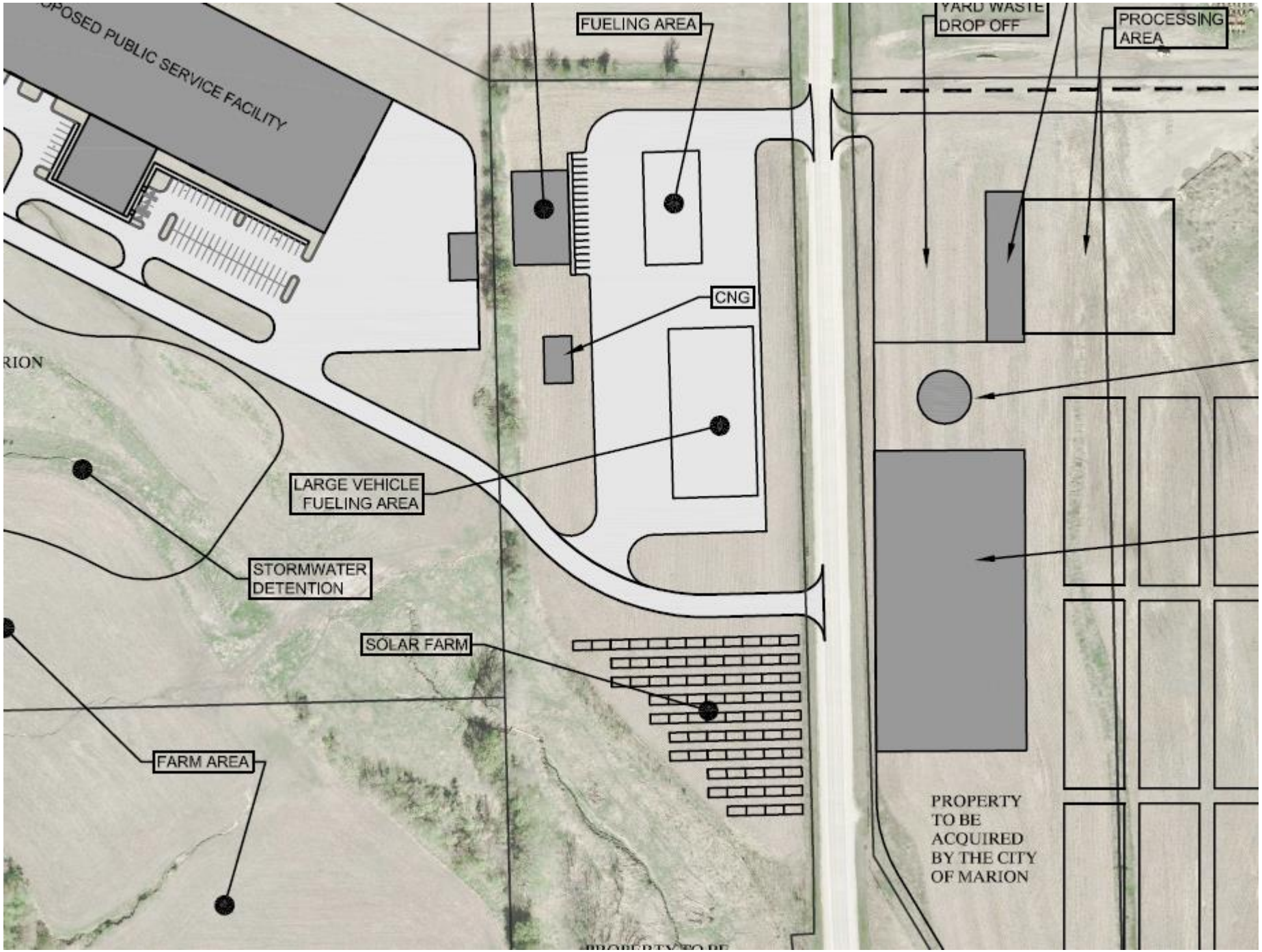
-Construction of fleet and retail fueling infrastructure to serve large fleets and retail customers

-Provide citywide transportation fuel savings.

-Increase transportation fuel security.

-Opportunities for Revenue Sharing

MARION Public Services



MARION
Public Services

ABES PROJECT NO: 313012	DRAWN BY: JAH APPROVED BY: JAH DATE: 1/12/16	NO. REVISION DESCRIPTION APPROVED DATE	ANDERSON BOGERT	Eco-Industrial Park	OPTION B

Eco Industrial Park Phase II-Retail Fueling Facilities

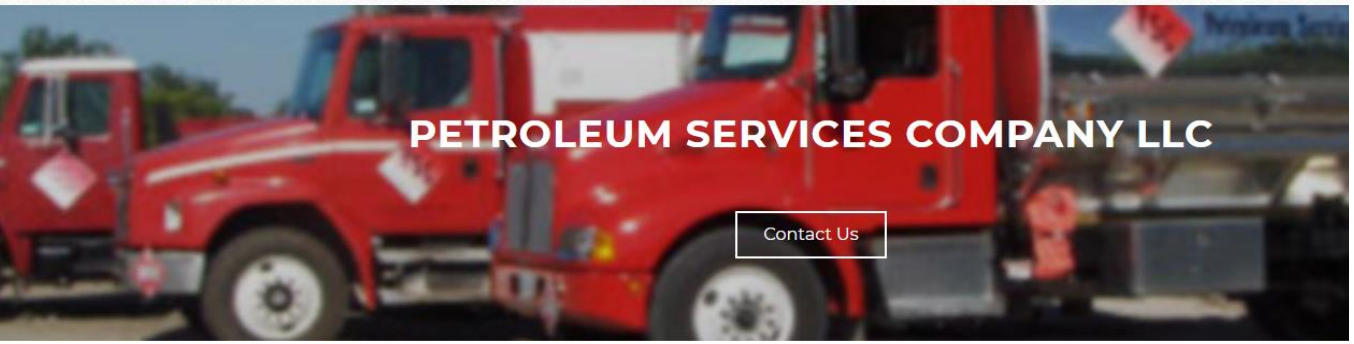
BULK FUEL TERMINAL
FUEL DELIVERY SERVICES

RETAIL DISPENSERS

MARION Public Services


KwikTrip

HOME PRODUCTS SERVICES LOCATIONS LINKS CONTACT US



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Based out of Coralville, IA. We offer products ranging from gas and diesel to various fuel additives with services that include bulk delivery to your location! Here is more information on all of our products and services.

PSC carries only the best brands and has membership in numerous reputable organizations. Contact us today to discuss how we can fulfill your petroleum needs.

Products | Services | Locations

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CONTACT DETAILS

1205 1st Ave
P.O. Box 5716
Coralville, IA 52241
(319) 351-6498

Hawkeye Convenience Stores

MARION Public Services

IOWA DOT

SMARTER | SIMPLER | CUST

Des Moines Terminal Average Fu

Monday, June 11, 2018	
Ultra LS Diesel # 1	2.4206
Ultra LS Diesel # 2	2.2455
Unleaded 87	2.2255
Ethanol	1.4962
E-70	1.7150
U87E10	2.0145
Biodiesel B100-(Multi-blend) *(DM) W/R*	3.3850

Tuesday, June 12, 2018	
Ultra LS Diesel # 1	2.4194
Ultra LS Diesel # 2	2.2408
Unleaded 87	2.2159
Ethanol	1.4915
E-70	1.7088
U87E10	2.0059
Biodiesel B100-(Multi-blend) *(DM) W/R*	3.3850 *

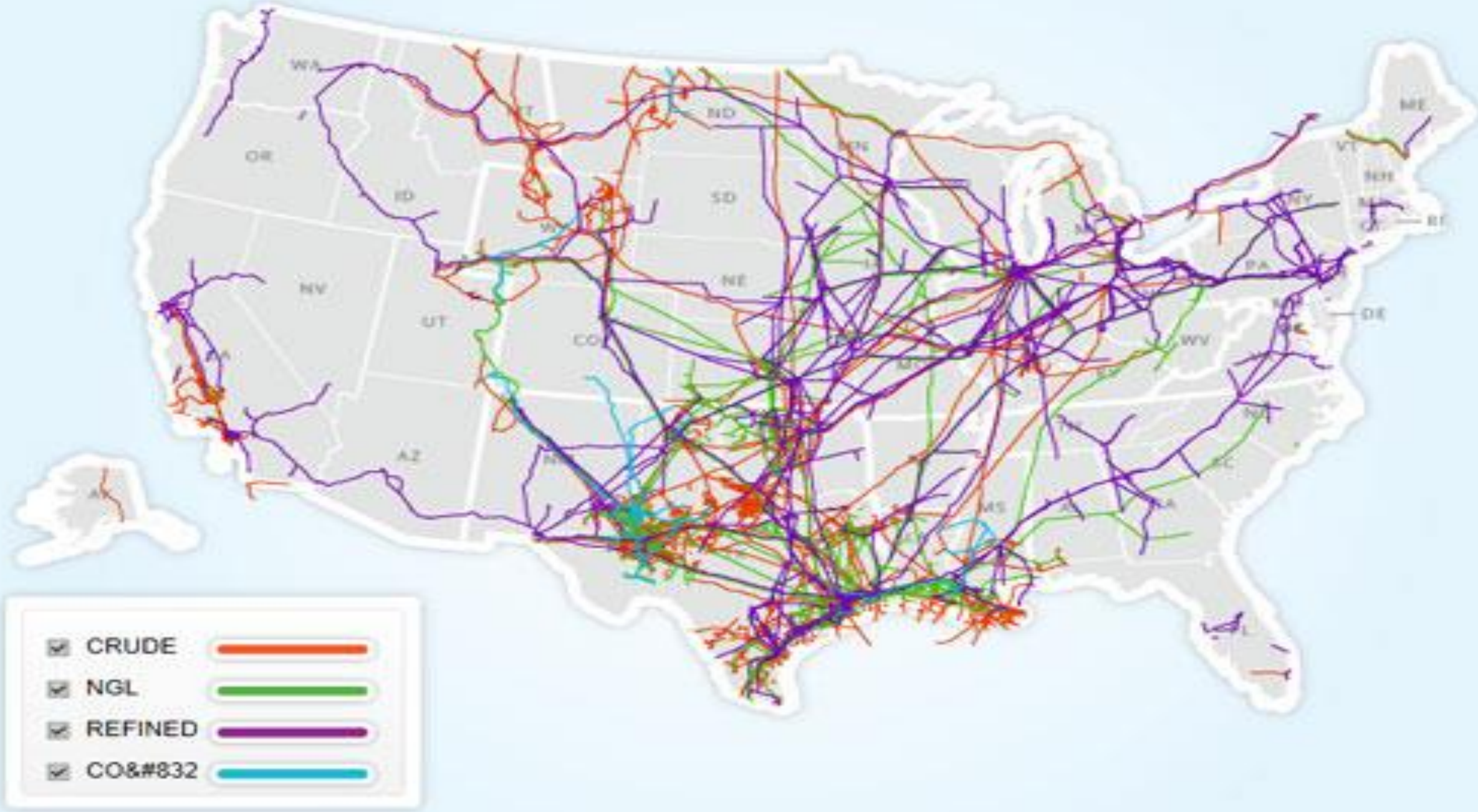
MARION Public Services

BRANDED FUEL

UNBRANDED FUEL

MARION Public Services

Magellan Pipeline Company-Coralville, Iowa



Source: American Energy Mapping (AEM) 2013

Eco Industrial Park Phase II-Retail Fueling Facilities

-Will include leased or cost shared fueling facilities.

-Operations will be privately run.

-Revenue share will be contingent on city investment.

-Opportunity to brand and market transportation products.

MARION Public Services

FRONT SIDE

RIGHT SIDE

MARION Public Services

BEER CAVE & COOLER

COOLER

DROP CEILING FASCIA

CASHIER, PIZZA & BEVERAGES

MARION Public Services

FRONT WALL SEATING

CEILING PODS ABOVE SEATING

FRONT WALL ENTRANCE & MERCHANDISE

HOT FOOD & COFFEE ISLAND

MARION Public Services

Eco Industrial Park Phase II-Retail Fueling Facilities-Next Steps

-Provide final schedule of improvements for fueling infrastructure.

-Complete and execute third party operations and maintenance agreement.

-Finalize cost of improvements and move towards construction package (Summer of 2019).

MARION Public Services

MATERIAL RECOVERY FACILITIES

MARION Public Services

Capital Improvement Program

City Facilities

Eco Industrial Park - Phase III Zero Waste Facility

Project Information

Category: City Facilities
Department: Public Services
Priority:
Fund: 670 - Solid Waste
Est. Completion Date: TBD
Project Number: 670 000001

Stragetic Goal	
Revitalize Central Corridor	
Zero Waste Community	X
Higher Design Standards	
Transportation	X
Planned Growth	X

Description & Scope:
Cosntruction of facilities and equipment to recycle muncipal solid waste.

Purpose:
Achieve Strategic Goal of becoming a Zero Waste Community. Provide cost savings and increase level of solid waste services to the community.

History & Key Milestones:

Financial Summary

Expenditures	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	Total FY 2017-2022
FY2018 Proposed			4,000,000				
FY2017 Adopted							-
Change	-	-	4,000,000	-	-	-	-

Operating Impact:

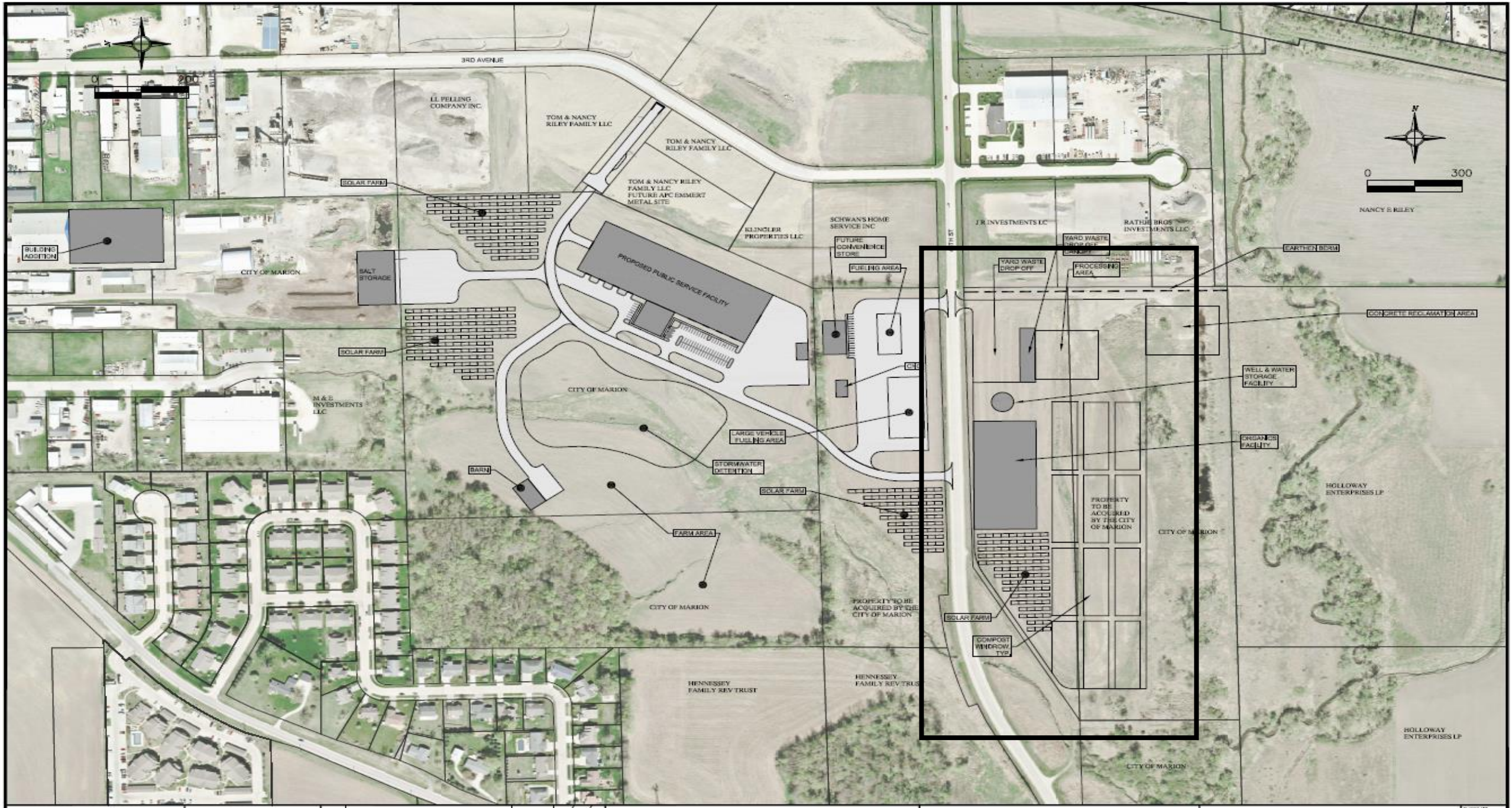
Funding Overview	
Est. Total Project Cost	**4,000,000**
Prior Years Funding	
Prior Years Available	
FY2018 Proposed	
FY2019-2022 Planned	4,000,000
Remaining Need	-

FY2018 Budget Distribution	
Planning/Design	
Acquisition/Relocation	
Site Improvements	
Construction	4,000,000
Furniture/Equipment	
Other	
Total	**4,000,000**

Funding Source(s): Private Equity or Revenue Bond

Notes:

MARION Public Services



ABES PROJECT NO: 313012

DRAWN BY: JAH
APPROVED BY: JAH
DATE: 1/12/16

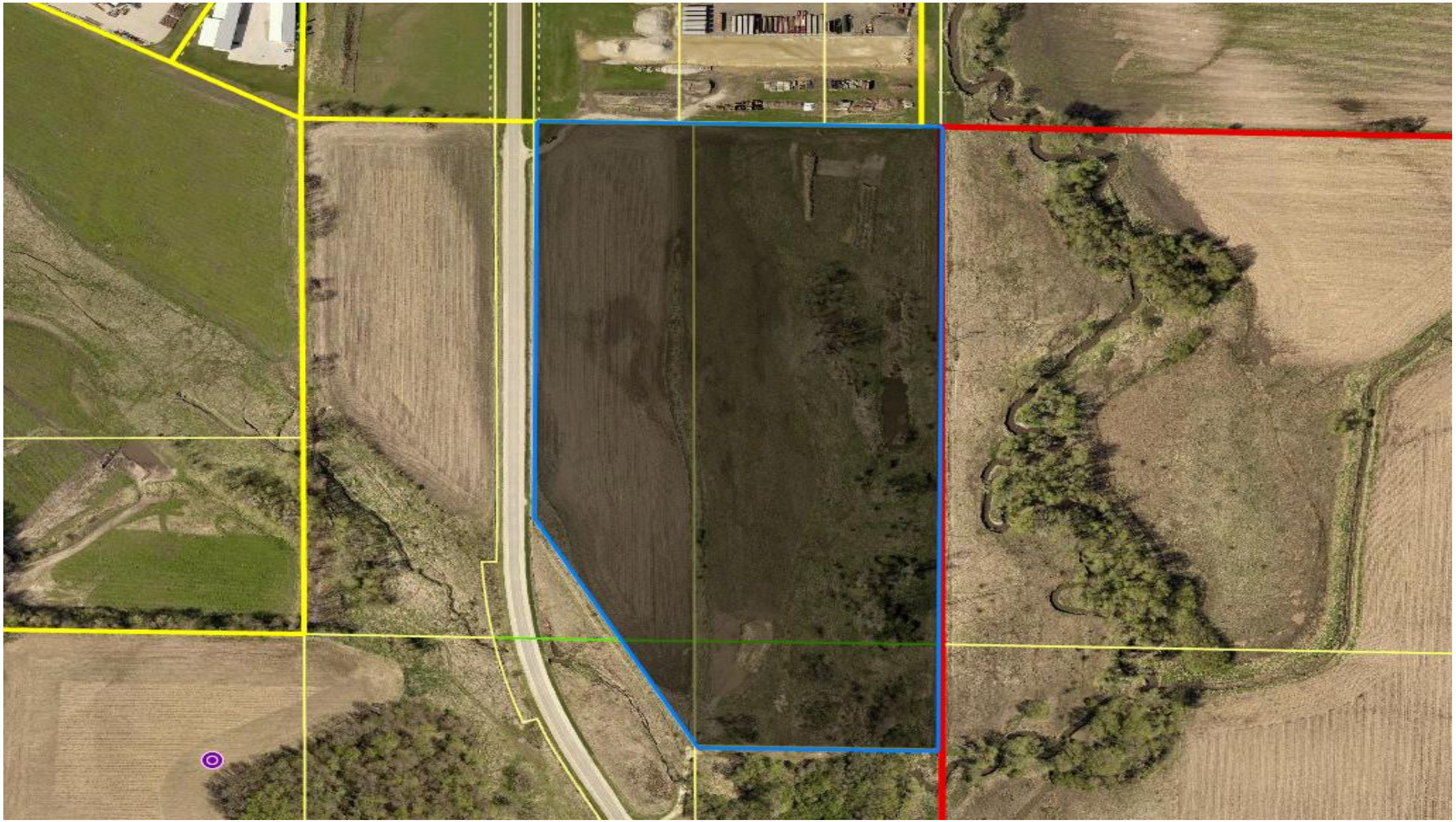
NO.	REVISION DESCRIPTION	APPROVED	DATE

ANDERSON BOGERT

Eco-Industrial Park

OVERALL SITE CONCEPT

SHEET NO. 1 OF 1



MARION
Public Services

YARD WASTE FACILITIES AT PUBLIC SERVICE 2010

MARION Public Services

YARD WASTE FACILITIES AT PUBLIC SERVICE 2017

MARION Public Services

MATERIAL RECOVERY FACILITIES

Anaerobic compost operations can take 6 to 8 months to process compost materials.

Front End loader is utilized to turn composted piles which can result in significant fuel costs.

MARION Public Services

Material Recovery Facility

Aerobic Composting Operations has reduced processing time down to eight weeks.

Faster processing time and less odor.

MARION Public Services

Material Recovery Facility

Compost-is organic matter that has been decomposed (reverse photosynthesis where organic cells are broken down.

Requires four equally important ingredients to work effectively:

Carbon — for energy; the microbial oxidation of carbon produces the heat.

Nitrogen — to grow and reproduce more organisms to oxidize the carbon.

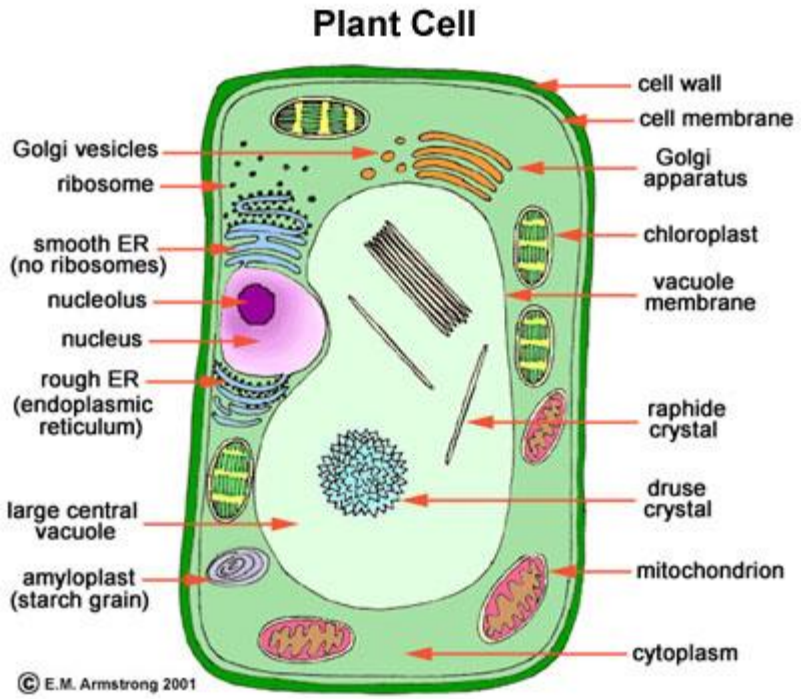
Oxygen — for oxidizing the carbon, the decomposition process.

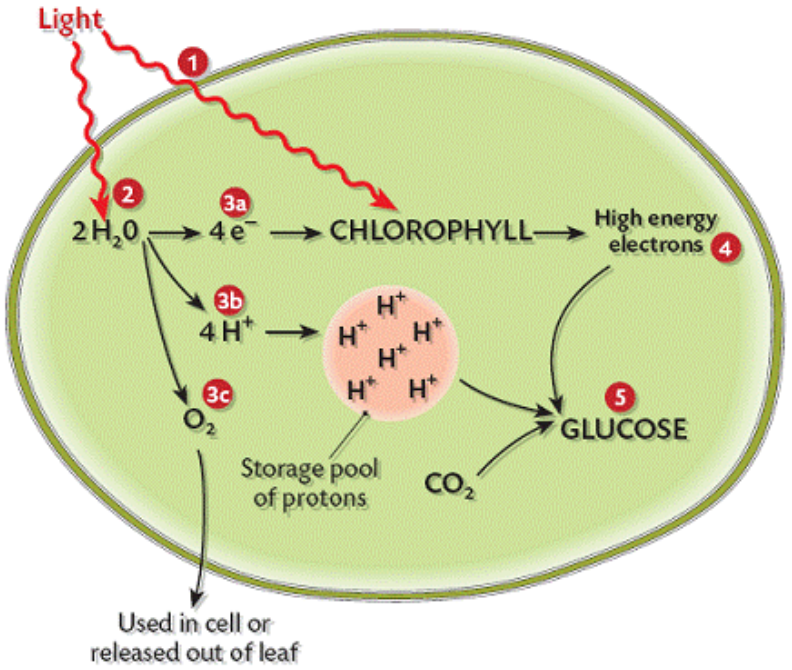
Water — in the right amounts to maintain activity without causing anaerobic conditions.

Aerobic conditions very critical.

Material Recovery Facility

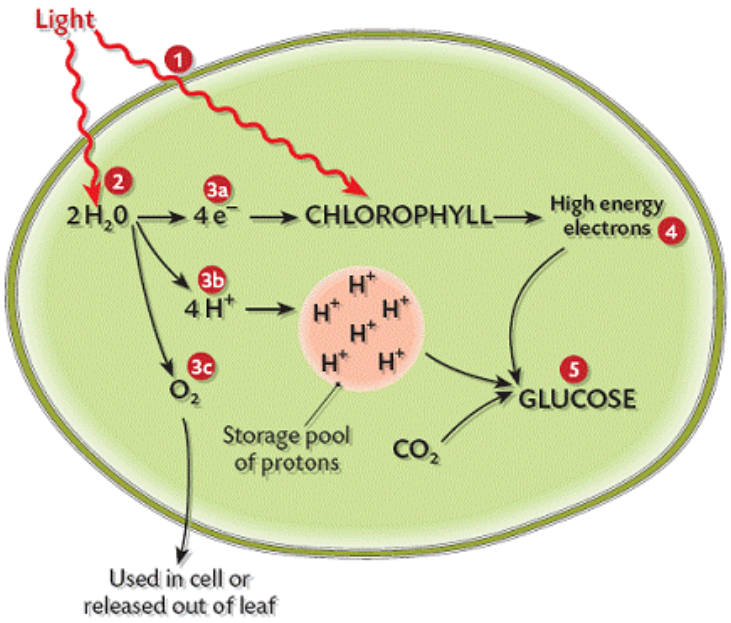
Composting Process- Plant cells are decomposed (reverse photo synthesis) and as a result, everything within the plant cell (high energy electrons) are released.



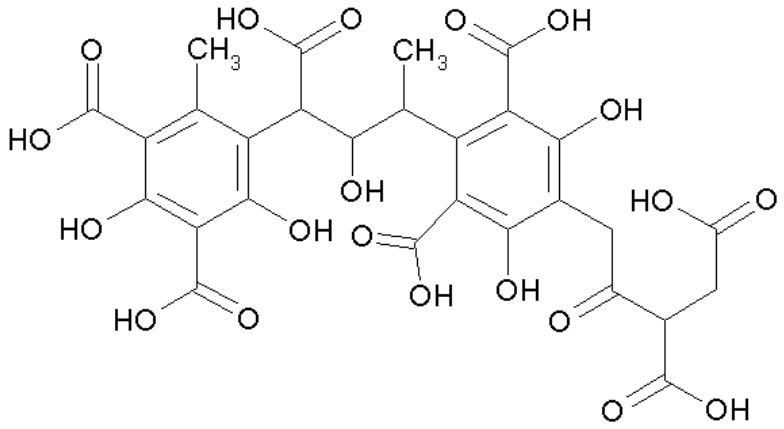


Material Recovery Facility

Humufication Polymer Protein – decaying cell matter (through composting) is bonded together in a polymer protein chain through the humification process…when applied to the soil released microbes that interact with soil structure.



Humus Protein Structure



Material Recovery Facility

Compost vs. Humus Compost

Humus Compost- refers to any organic matter that has reached a point of stability by the formation of humus protein chains by the polymerization of microbes. Formation and structure remains stable for centuries, if not a millennia.

Humified Compost

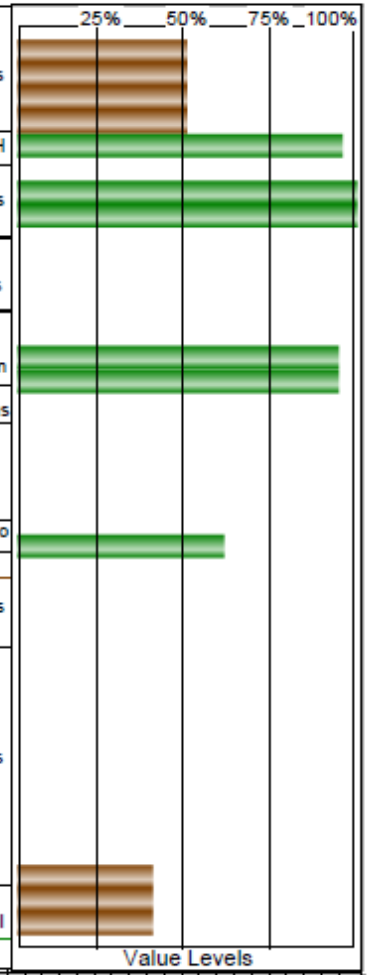
Compost

Material Recovery Facility

Soil Impact Analysis

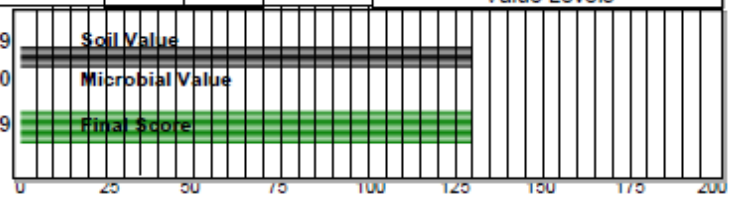
	Desirable Level	Your Results	Your Points	Total Potential Points	
Nitrogen Cycle			50	84	
% N (Dry Basis)	0.6 - 1.2	2.0%			
NH_3- Ammonia	< 50	0 ppm			Nitrogens
NO_2- Nitrite Nitrogen	0	0 ppm			
NO_3- Nitrate Nitrogen	600 - 900	189 ppm			
pH	7.3 - 8.1	8.2 su	11	13	pH
Salts			26	26	
Sodium	125 - 200	300 ppm			Salts
Conductivity	2000 - 3500	2,160 Ergs			
Sulfur			-16	26	
Sulfate	100 - 500	167 ppm			Sulfurs
Sulfide	0	* 1 level			
Germination			26	26	
7 Day Germination %	> 80	100.0 %			Germination
14 Day Vigor %	> 70	100.0 %			
Humic Ions	50 - 80	633.0	-4	13	Humic Ions
Redox Potential					
Oxygen Potential	26.5 - 29	28.2			
Moisture %	40 - 50	50.0 %			
Organic Carbon		24.0 %			
C:N Ratio	15 - 20	12.0:1	7	13	C:N Ratio
Soil Impact Score			100	200	
Pathogens			0	27	
E. Coli	neg (=< 3 MPN/g)	*NT			Pathogens
Salmonella	neg (=< 0.5MPN/g)	*NT			
Microbe Profile & Diversity Analysis			0	173	
Aerobic Count	100M - 10B	*NT			
Anaerobic Bacteria	1:10 Aerobic	*NT			
Yeasts & Molds-Fungi	10K - 500K	*NT			
Actinomycetes	1M - 100M	*NT			Microbes
Pseudomonads	10K - 1M	*NT			
N-Fixing Bacteria	100K - 1M	*NT			
Aerobic:Anaerobic	10:1 to 39:1	*NT :1			
Diversity	>6.5	0			
Maturity Index	>50	*NT			
Stability	<20	*NT			Overall
Microbial Score:			0	200	

* NT Indicates "Not Tested"



Value Chart

Notes:
MMM: n.d., Ash 29.7%, % Solids:50%
E.Coli: n.d., Salmonella: n.d.
Fecal Coliform: n.d.
Weed Seed Germination: n.d.



Trace Elements (ppm)

B	20.4 ppm	Cu	16.4 ppm		
Fe	3,619.0 ppm	Zn	56.3 ppm		

Structure
Density

Building Blocks (% Dry Basis)

Ca	3.7 % Dr	K	0.9 % Dr
Mg	1.0 % Dr	P	0.3 % Dr

Chlorides
Cl

Heavy Metals (ppm)

Al		Hg	0 ppm	Ni	4.5ppm
As	0 ppm	Mn	247.0 ppm	Pb	10.9ppm
Cd	0 ppm	Mo		Se	0ppm
Cr	10.0 ppm				

Weed Seed Germination

Weeds	%

Pathogen Inhibition Tests

	% Strong	% Partial	% None
	% Strong	% Partial	% None

Other Tests

Dewar Self-Heating		Enterococcus		Helminth Ova	
Humic Acid		Fecal Coliform		Phytotoxicity	
Staph. Aureus	0	Aflatoxin	0	Listeria	0
Cation Exch. Cap.		Vol. Org. Acids		Vol. Solids	

MATERIAL RECOVERY FACILITIES

Significant increase in citizen traffic and volumes.

During peak season over 1,000 vehicles per day will utilize the yard waste facilities (25,000 to 28,000 vehicles annually).

Volumes of yard waste increasing as city continues to grow.

Adequate facilities for processing organic material from storm damage.

MARION Public Services

Marion's Zero Waste Objective

- Process municipal solid waste (MSW) into commodities
- **> 90% diversion** of landfill materials to recycling and energy products (Zero Waste)
- Low capital and operating costs.
- Regional cooperation and integration.
- Operations and Maintenance executed by city staff.
- Ability to expand facility and incorporate additional technologies
- Incorporate within Eco Industrial Park operations.

MARION Public Services


WEST
YELLOWSTONE
PROHIBITED
MATERIALS
Monday
Saturda
Sunday
Holiday
Rates:
Please

Vickers Seerdrum at West Yellowstone Compost Facility

MARION Public Services

Seerdrum Operation at West Yellowstone Compost Facility.
Purchased in 2003…manufactured in 1969.

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Cellulose Material
40% to 60% of solid waste composition

Recyclables

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Invessel Composting at West Yellowstone

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Compost without seerdrum separation @ 10 weeks

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Air Classifier- Utilized to screen compost

MARION Public Services

Screen inorganic material

MARION Public Services

Finished Material/Compost

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OBJECTIVES FOR MATERIAL RECOVERY FACILITIES

Introduce new processing technologies for organic diversion.

Expand footprint of citizen yard waste drop off area.

Expansion of organic products offered at the facility.

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MATERIAL RECOVERY FACILITIES-NEXT STEPS

Completion of site design and schedule of civil improvements.

File and obtain related permits with IDNR for expanding organic operations.

Schedule and execute demonstration project for organic diversion.

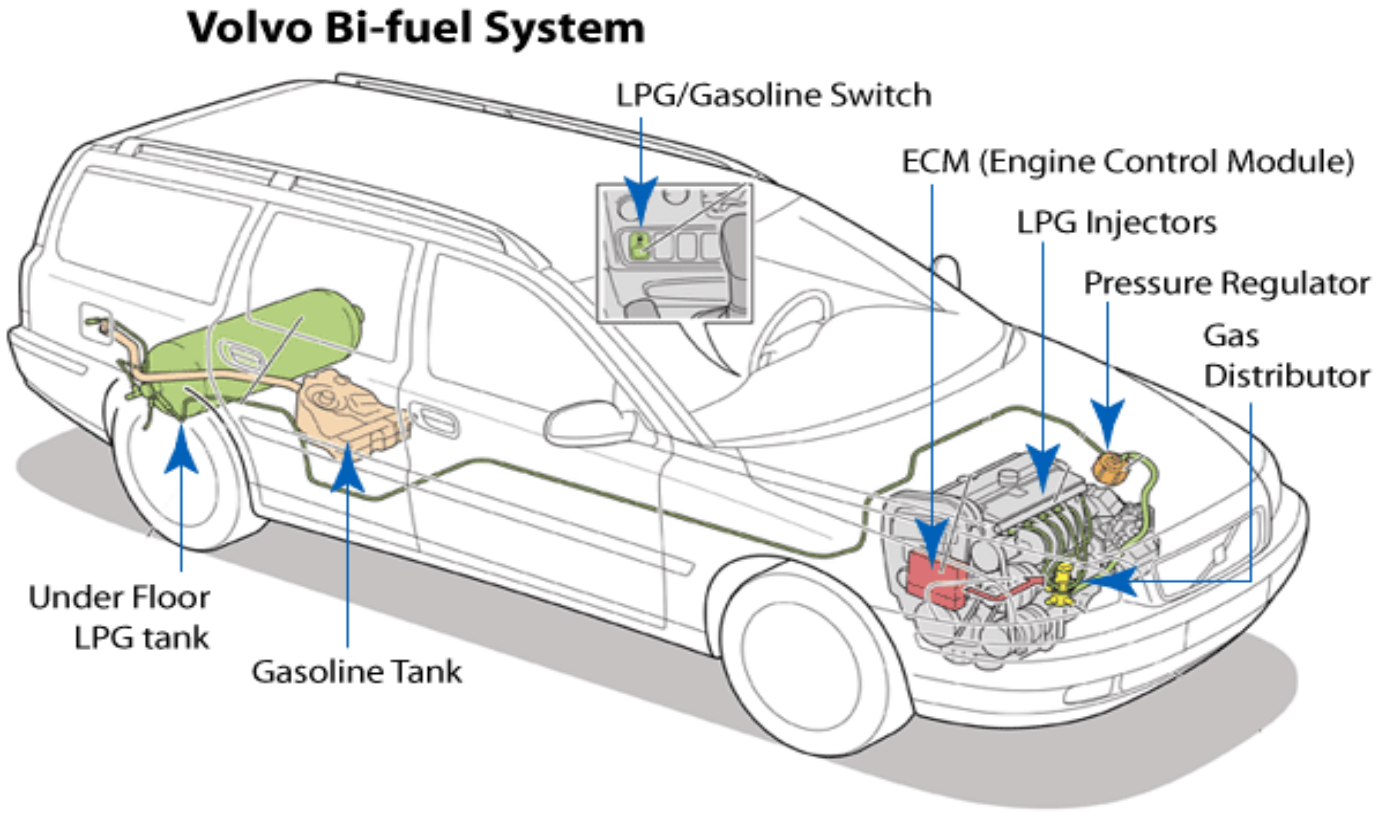
MARION Public Services

Propane (Auto-gas)

Propane (Auto-gas)

Propane is domestically available, high energy, cleaning burning and relatively low cost.

Third most common transportation fuel in world.



MARION Public Services

Workbook Contents

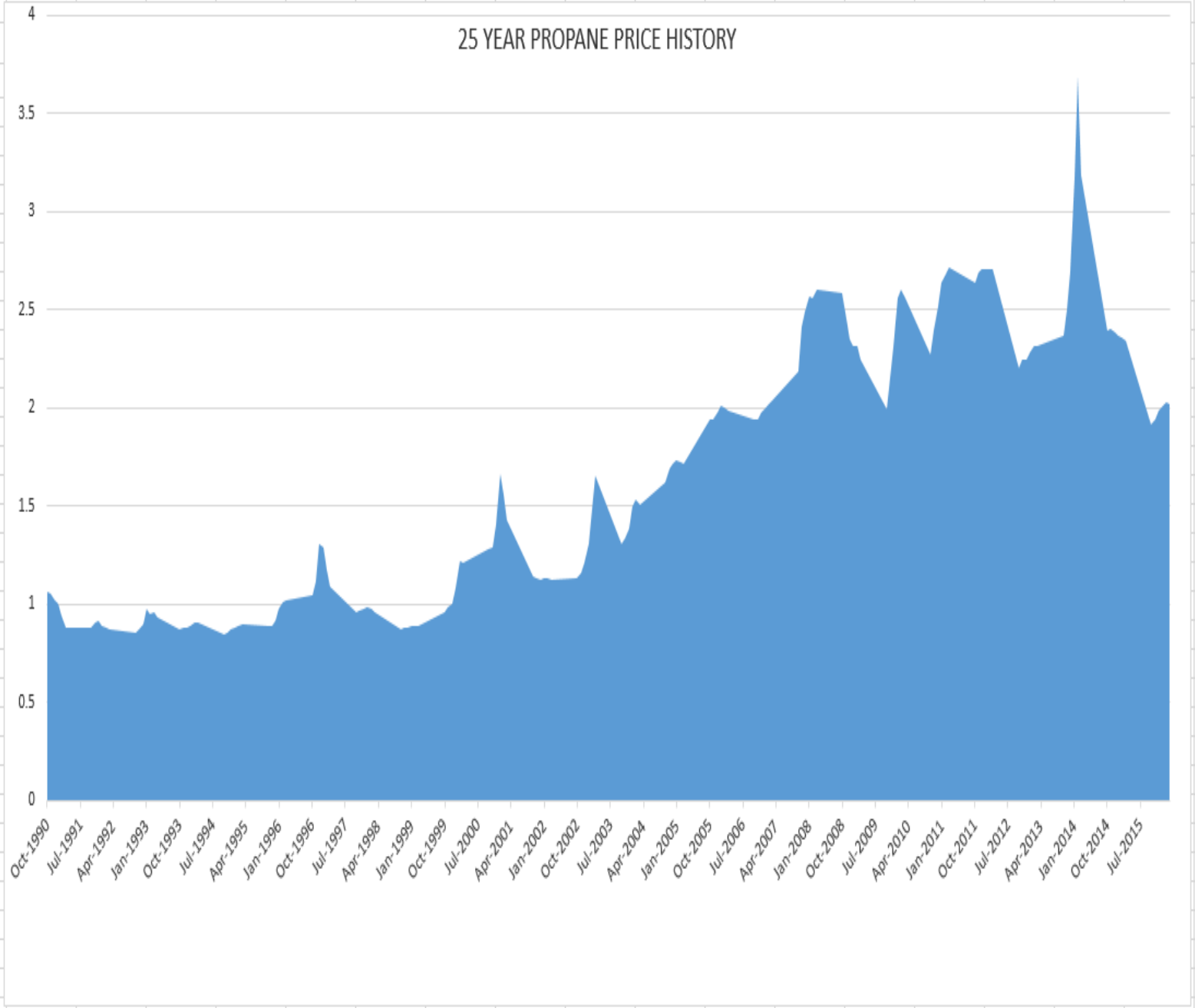
U.S. Propane Residential Price (Dollars per Gallon)

Click worksheet name or tab at bottom for data

Workshee	Descriptic	# Of Series	Frequenc	Latest Dat
Data 1	U.S. Propa	1	Monthly	3/2016

Release D	3/30/2016
Next Relea	10/5/2016
Excel File	m_epllpa_prs_nus_dpgm.xls
Available fr	http://tonto.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPLLPA_PRS_NUS_DPG&f=M
Source:	Energy Information Administration
For Help, (	infoctr@eia.doe.gov
	(202) 586-8800

AVERAGE 25 YEAR PROPANE PRICE: $1.63



MARION Public Services

2014 MID-WEST PROPANE CRISIS

Office of the Governor of Iowa

TERRY BRANSTAD

Enter your keywords

HOME | ABOUT THE GOVERNOR | GOALS | NEWSROOM | SCHEDULE | CONSTITUENT SERVICES | CONTACT

Home

Propane Shortage and Heating Assistance Webpage

Low-Income Home Energy Assistance Program (LIHEAP)

Low-income Iowans may be eligible for assistance with their energy bills, through the LIHEAP program. Individuals can go to their local Community Action Agency to apply. Income requirements and guidelines are available online or via the Department of Human Rights at 515-281-0859.

On Thursday, January 30, the U.S. Department of Health and Human Services released a second LIHEAP appropriation of $7,419,062 to the State of Iowa.

Reductions in Regulatory Burdens to Propane Transport

The U.S Department of Transportation established a regional emergency declaration suspending the regulatory provisions pertaining to hours of service

MARION Public Services