



November 18, 2015

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

2015-10-20-05
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Environmental Protection Agency
WPC-Permit Log In

RE: Renewal Application
Arnold Engineering Corporation (Marengo Facility)
Wastewater Treatment and Recycle System
Permit No. WPCP 2011-EO-1001-2

Dear Sir or Madam:

Enclosed is an application for renewal of Water Pollution Control Permit 2011-EO-1001-2 covering operation of the existing wastewater treatment and recycle system at Arnold Magnetic Technologies, located at 300 North West Street in Marengo, Illinois. The application includes the following documentation:

- Form WPC-PS-1, *Application for Permit or Construction Approval*;
- Form Schedule J, *Industrial Treatment/Pretreatment Works*;
- Form Schedule N, *Waste Characteristics*;
- A process description; and,
- A water recycle system schematic.

Please direct all correspondence regarding the renewal application to my attention. If you require further detail on the application, please contact me directly at (585) 385-9010, extension 211.

Sincerely,
Arnold Magnetic Technologies

Nadine Marion
Director of Environmental Health and Safety

Enclosures



Illinois Environmental Protection Agency

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Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Application for Permit or Construction Approval WPC-PS-1

For IEPA Use Only:

This form must be typewritten or printed legibly. This form may be completed manually or online using Adobe Reader, a copy of it saved locally, printed, and signed before it is submitted to:

Illinois Environmental Protection Agency
Permit Section, Division of Water Pollution Control
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Reset All Fields

1. Owner Name: Arnold Magnetic Technologies Name of Project: Wastewater Treatment and Recycle System
Project Location Address (include nearest street and city address): 300 N. West St
City: Marengo Zip Code: 60152
Township: Marengo County: McHenry

2. Brief Description of the Project:

Renewal of Operating Permit 2011-EO-1001-2 for existing sanitary and industrial water recycling system. Original permit application submitted in 1975 and system has been in operation since that date. See Schedule J for process diagram and description.

3. Documents being Submitted: If the Project involves any of the items listed below, submit the corresponding schedule, and check the appropriate boxes

	Schedule		Schedule
Private Sewer Connection/Extensions	A/B <input type="checkbox"/>	Spray Irrigation	H <input type="checkbox"/>
Sewer Extension Construction Only	C <input type="checkbox"/>	Septic Tanks	I <input type="checkbox"/>
Sewage Treatment Works	D <input type="checkbox"/>	Industrial Treatment/Pretreatment	J <input checked="" type="checkbox"/>
Excess Flow Treatment	E <input type="checkbox"/>	Waste Characteristics	N <input checked="" type="checkbox"/>
Lift Station/force Main	F <input type="checkbox"/>	Erosion Control	P <input type="checkbox"/>
Fast Track Service Connection	FTP <input type="checkbox"/>	Trust Disclosure	T <input type="checkbox"/>
Sludge Disposal	G <input type="checkbox"/>		

Plans:

Title: Arnold Engineering Water Recycle System No. of Pages: _____

Specifications:

Title: NA No. of Books/Pages: _____

Other Documents: NA
(Please specify)

3.1 Illinois Historic Preservation Agency approval letter Yes No

(If you have a copy of the IHPA approval letter, please send in with the Permit Application Package)

4. Land Trust: Is the project identified in item Number 1 therein, for which a permit is requested, to be constructed on land which is the subject of a trust? Yes No

If yes, Schedule T (Trust Disclosure) must be completed and item 7.1.1 must be signed by a beneficiary trustee or trust officer.

5. This is an application for (Check appropriate box):

- A. Joint Construction and Operating Permit
 B. Authorization to Construct (See Instructions) NPDES Permit No. IL00: _____ Issuance Date: _____
 C. Construction Only Permit (Does Not Include Operations)
 D. Operate Only Permit (Does Not Include Construction)
 E. Supplemental Permit Request to Existing State Construction or Operating Permit No.: _____
Issuance Date: _____

6. Certifications and Approval

6.1 Certificate by Design Engineer (When required: refer to instructions)

I hereby certify that I am familiar with the information contained in this application, including the attached schedules indicated above, and that to the best of my knowledge and belief such information is true, complete and accurate. The plans and specifications (specifications other than Standard Specifications or local specifications on file with this Agency) as described above were prepared by me or under my direction.

Licensed Professional Engineer's Name: NA

Licensed Professional Engineer's Title: _____

Registration Number: _____ License Expiration Date: _____

Company: _____

Street Address: _____ PO Box: _____

City: _____ State: _____ Zip + 4: _____

Email Address: _____ Phone: _____

Printed Name: _____

Original Signature:

Date:

7. Certifications and Approvals for Permits:

Licensed Professional Engineer's Seal

7.1 Certificate by Applicant(s):

I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application, and am/are authorized to sign this application in accordance with the Rules and Regulations of the Illinois Pollution Control Board. I/we hereby agree to conform with the Standard conditions and with any other Special Conditions made part of this Permit.

7.1.1 Name of Applicant for Permit to Construct: NA

Title: _____ Organization: _____

Street Address: _____ PO Box: _____

City: _____ State: _____ Zip + 4: _____

Email Address: _____ Phone: _____

Printed Name: _____

Original Signature:

Date:

7.1.2 Name of Applicant for Permit to Own and Operate: Arnold Magnetic Technologies - Arnold Engineering
Title: Mr. Michael Stachura Organization: Arnold Magnetic Technologies
Street Address: 770 Linden Avenue PO Box: _____
City: Rochester State: NY Zip + 4: 14625
Email Address: mstachura@ArnoldMagnetics.com Phone: (585) 385-9010 x246
Printed Name: Michael Stachura

Michael Stachura Nov 18, 2015
Original Signature: Date:

7.2 Attested (Required When Applicant is a Unit of Government)
Title: _____
City clerk, Village Clerk, Sanitary District Clerk, etc.)

Original Signature: Date:

7.3 Applications from non-governmental applicants which are not signed by the owner, must be signed by a principal executive officer of at least the level of vice president, or a duly authorized representative.

7.4 Certificate by Intermediate Sewer Owner

I hereby certify that (Please check one):

- 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the Illinois Environmental Protection Act or Subtitle C, Chapter I, or
- 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction of facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

NA

Sewer System Owner: _____

Address: _____

City: _____ State: _____ Zip + 4: _____

Email Address: _____ Phone: _____

Printed Name: _____

Original Signature: Date:

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 DIVISION OF WATER POLLUTION CONTROL
 PERMIT SECTION

Environmental Protection Agency
 WPC-Permit Log In

Springfield, Illinois 62706

SCHEDULE J INDUSTRIAL TREATMENT WORKS CONSTRUCTION OR PRETREATMENT WORKS

1. **NAME AND LOCATION:**

1.1 Name of project Operating Permit Renewal of Existing Sanitary/Industrial Water Recycling System

1.2 Plant Location

1.2.1 NW 35 44N 5E 3rd
 Quarter Section Section Township Range P.M.

1.2.2 Latitude 42 deg. 15 min. 14 sec. "NORTH"

1.2.3 Longitude 88 deg. 37 min. 14 sec. "WEST"

1.2.3 Name of USGS Quadrangle Map (7.5 or 15 minute) Harvard IL -WI 15 Minute

2. **NARRATIVE DESCRIPTION AND SCHEMATIC WASTE FLOW DIAGRAM:** (see instructions)

Original application submitted in 1975. Updates were submitted in 1984, 1989, and 1993. With the exception of flow rates, operation of the system has remained essentially the same since 1993. Updated description attached.

2.1 **PRINCIPAL PRODUCTS:**

Industrial and commercial magnets and magnetic materials.

2.2 **PRINCIPAL RAW MATERIALS:**

Aluminum, nickel, cobalt, iron, steel, acids, oils

3. **DESCRIPTION OF TREATMENT FACILITIES:**

3.1 Submit a flow diagram through all treatment units showing size, volumes, detention times, organic loadings, surface settling rate, weir overflow rate, and other pertinent design data. Include hydraulic profiles and description of monitoring systems.

3.2 Waste Treatment Works is: Batch , Continuous , No. of Batches/day _____ , No. of Shifts/day _____

3.3 Submit plans and specifications for proposed construction.

3.4 Discharge is: Existing ; Will begin on _____.

4. **DIRECT DISCHARGE IS TO:** Receiving Stream Municipal Sanitary Sewer Municipal storm or municipal combined sewer

If receiving stream or storm sewer are indicated complete the following:

Name of receiving stream N/A ; tributary to N/A ;
 tributary to N/A ; tributary to N/A ;

5. Is the treatment works subject to flooding? Yes No If so, what is the maximum flood elevation of record (in reference to the treatment works datum) and what provisions have been made to eliminate the flooding hazard?

6. **APPROXIMATE TIME SCHEDULE:** Estimated construction schedule:

Start of Construction _____ ; Date of Completion _____

Operation Schedule _____ ; Date Operation Begins _____

100% design load to be reached by year _____.

7. **DESIGN LOADINGS**

7.1 Design population equivalent (one population equivalent is 100 gallons of wastewater per day, containing 0.17 pounds of BOD₅ and 0.20 pounds of suspended solids;

BOD N/A ; Suspended Solids N/A ; Flow N/A

7.2 Design Average Flow Rate N/A MGD.

- 7.3 Design Maximum Flow Rate N/A MGD.
7.4 Design Minimum Flow Rate N/A MGD.
7.5 Minimum 7-day, 10-year low flow N/A cfs N/A MGD.
Minimum 7-day, 10-year flow obtained from N/A
7.6 Dilution Ratio N/A ; _____.

8. FLOW TO TREATMENT WORKS (if existing):

- 8.1 Flow (last 12 months)
8.1.1 Average Flow 0.022 MGD
8.1.2 Maximum Flow 0.087 MGD
8.2 Equipment used in determining above flows

9. Has a preliminary engineering report for this project been submitted to this Agency for Approval?

Yes No . If so, when was it submitted and approved. Date Submitted 9/30/1964
Certification # 19640-FA-546
Dated 10/19/1964

10. List Permits previously issued for the facility:

1994-EO-1340-2, 1999-EO-4027, 2004-EO-0971, 2006-EO-0690, 2011-EO-1001-2

11. Describe provisions for operation during contingencies such as power failures, flooding, peak loads, equipment failure, maintenance shut downs and other emergencies.

Backup pumps are present to provide assistance in case of main pump failure.

12. Complete and submit Schedule G if sludge disposal will be required by this facility.

13. WASTE CHARACTERISTICS: Schedule N must be submitted.

14. TREATMENT WORKS OPERATOR CERTIFICATION: List names and certification numbers of certified operators:

James B. Roozee - Industrial Wastewater Treatment Works Operator (Issued 2/2/2010, valid until 12/31/2017)

2015-60605

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that section. Failure to do so may prevent this form from being processed and could result in your application being denied.

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DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62794-9276

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SCHEDULE N WASTE CHARACTERISTICS

1. Name of Project Operating Permit Renewal of Existing Sanitary/Industrial Water Recycling System

	EXISTING	PROPOSED-DESIGN
2.1 Average Flow (gpd)	<u>22,475</u>	<u>NA</u>
2.2 Maximum Daily Flow (gpd)	<u>86,624</u>	<u>NA</u>

2.3 TEMPERATURE

Time of Year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp. F	Max. Effluent Temp. F	Max. Temp. Outside Mixing Zone F
SUMMER	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
WINTER	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

2.4 Minimum 7-day, 10-year flow: N/A cfs N/A MGD.

2.5 Dilution Ratio: N/A ; N/A

2.6 Stream flow rate at time of sampling N/A cfs N/A MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions ; Existing conditions ; Proposed Permitted Conditions

Type of sample: grab (time of collection Below); composite (Number of samples per day _____)

(see instructions for analyses required) 2014 collection dates: 5/15, 6/16, 7/14 8/18, 9/15, 10/13, 11/18, 12/8,
2015 collection dates: 1/15, 2/9, 3/11, 4/3

CONSTITUENT	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l) Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (as N)	NA	NA	NA	NA
Arsenic (total)	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Boron	NA	NA	NA	NA
BOD ₅	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Carbon Chloroform Extract	NA	NA	NA	NA
Chloride	NA	NA	NA	NA
Chromium (total hexavalent)	NA	NA	NA	NA
Chromium (total trivalent)	NA	NA	NA	

CONSTITUENT	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l) Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Copper	NA	NA	NA	NA
Cyanide (total)	NA	NA	NA	NA
Cyanide (readily released @ 150° F & pH 4.5)	NA	NA	NA	NA
Dissolved Oxygen	NA	NA	NA	NA
Fecal Coliform	NA	NA	NA	NA
Fluoride	NA	NA	NA	NA
Hardness (as Ca CO ₃)	NA	NA	NA	NA
Iron (total)	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Manganese	NA	NA	NA	NA
MBAS	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Nickel	NA	Avg 0.04; Max 0.08	NA	NA
Nitrates (as N)	NA	NA	NA	NA
Oil & Grease (hexane solubles or equivalent)	NA	NA	NA	NA
Organic Nitrogen (as N)	NA	NA	NA	NA
pH	NA	Avg 7.24; Max 8.94	NA	NA
Phenols	NA	NA	NA	NA
Phosphorous (as P)	NA	NA	NA	NA
Radioactivity	NA	NA	NA	NA
Selenium	NA	NA	NA	NA
Silver	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA
Suspended Solids	NA	NA	NA	NA
Total Dissolved Solids	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
Others	NA	NA	NA	NA
Total Residual Chlorine	NA	Avg 0.15; Max 0.34	NA	NA



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Narrative Description of the Arnold Engineering Recycle Water System
Reference Schedule J

Environmental Protection
WPC-Permit Log 1r

The Arnold Magnetic Technologies Corporation recycled water system contains a series of 4 ponds that provide up to 1.5 million gallons per day (gpd) of cooling water through a separate distribution system to the manufacturing processes. The recycled water is treated prior to reuse in the plant. Water from an 850-foot deep private well is pumped to supply sanitary water, make-up cooling water, and process water. Approximately 90% of the well water flows into the recycle water system drains, which load Pond 1.

SANITARY WASTEWATER SYSTEM

The remaining 10% of well water is used in the plant's domestic sanitary sewage system. The sewage is collected in a separate sanitary sewer system and treated in an Amcodyne extended aeration activated sludge treatment plant with a rated capacity of 30,000 gpd. Through this treatment, flocculated biological growths (return activated sludge) are mixed with raw wastewater on a continuous basis and are aerated. The aerobic microorganisms utilize the organic waste matter as an energy source. The biological growths are then aerated and settled out. A portion of the material is wasted, while the rest is recirculated for mixture with additional waste.

PONDS
LINE

The Amcodyne system has a Worthington comminutor that breaks down any large particles before waste enters the 30,485 gallon aeration tank. Low-pressure air (less than 6 pounds per square inch (psi)) is supplied to porous diffusers. Spray devices are present to control foam. Activated sludge is returned from the bottoms of the 2 Imhoff cone settling tanks by an air lift method. The diffusers are placed so that incoming waste is mixed with returned activated sludge. A continuous air supply is provided to maintain aerobic conditions, solids suspension, and contact in the aeration tank. The overflow from the aeration tank passes through 2 Imhoff cones, which settle out the solids. The supernatant overflows into an 8-foot long weir, and 2 1/2" diameter pipe air lift

devices return the settled activated sludge to the aeration tank. Valves can be opened to waste part of this sludge to the 1,224 ft³ aerated sludge holding tank. The waste sludge is hauled away by a disposal service as needed. The chlorination tank and related components previously associated with this system have since been removed and are no longer present at the site.

In May 2014, the effluent from the sewage treatment plant had a biological oxygen demand (BOD) of 5.16 milligrams per liter (mg/L), and influent BOD of 252 mg/L. This resulted in a BOD removal efficiency of 98.0%. Testing of the mixed liquor and return sludge for settled solids is done periodically, and BOD is also run on the influent. Daily maintenance includes inspecting air diffusers in aerating and holding tanks, back flushing sludge return lines so sludge does not build up, and skimming off floatable solids from the skimmer. Monthly maintenance includes checking blower operation including belts, air cleaner, air check valves and lubrication.

RECYCLE WATER SYSTEM

The recycle water system is diagrammed on the attached schematic. The pump station draws from the bottom of Ponds 3 and 4 and is pumped under 60 psi pressure to all buildings on the property. Water flows from the bottom of Pond 1 to the surface of Pond 2 and so on to Pond 4. This helps to cool the water by air evaporation. Original dimensions (length x width x depth) of each pond are as follows:

- Pond 1 – 200' x 160' x 8.5'
- Pond 2 – 200' x 80' x 6.5'
- Pond 3 – 200' x 80' x 7'
- Pond 4 – 200' x 80' x 7.5'

Ponds 1 and 2 receive the greatest amount of sedimentation, typically FeCl₃, Ca₃(PO₄)₂, and SiO₂. Chemicals of interest in the ponds are phosphates from the carlite coating line. The phosphate reacts to form Ca₃(PO₄)₂ which settles in the ponds. All the water pumped by the pump station, plus the well water, returns to the ponds by means of 4 recycle lift stations.

The water treatment consists of sedimentation of suspended solids. Sodium hypochlorite may be applied at the pump station on an as needed basis to kill any bacteria in the pipe system or equipment, and may also be applied to Pond 3 and Pond 4 on an as-needed basis to control bacteria and algae. A phosphate solution known as AquaMag may be added at the pump station as a corrosion inhibitor. Suspension chemicals are added by metering pumps at the pump station to clean out pipe deposits and keep these in suspension until the slower velocity waters of the ponds allow particles to settle out. An antiscalant and an antifoulant are also added as needed to disperse silt, mud, and sludge deposits, and to prevent and remove iron oxide and scale deposits. An aquatic herbicide known as Reward may be added as needed to the ponds on an annual basis.

The discharge from Pond 4 flows to Pond 5 for further treatment, evaporation, and percolation.

During very heavy storms, some water may overflow at the main lift station when the typical pumping rate is exceeded. When additional quantities of storm water are received, the pond system will absorb a significant portion of any excess, and discharge to the ditch leading to Pond 5 south of Building 11.

Daily maintenance on the recycle system includes adding necessary chemicals, checking pressure and return pump operation, cleaning pump screen and filters as necessary, switching stand-by pumps on and changing temperature recording charts. Alarm systems warn maintenance when lift or pressure pumps are not operating or line pressure drops. Routine pump, meter and other equipment maintenance is performed as needed.

POTABLE WATER SYSTEM

The facility's potable water supply consists of an 850-foot well with a submersible turbine pump, which pumps on plant demand or to fill up the level in the water tower. The well water is chlorinated to a residual of greater than 0.5 ppm for disinfection. Provision is made to add well water to the ponds to make-up for evaporation losses. There is no connection to the Marengo water supply from the facility's potable water supply. Our water supply is checked annually for coliform bacteria in accordance with regulatory requirements. Normal pump and tower maintenance is performed as needed. The operation of the potable water system is overseen by the site's certified Class K operator.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR

LISA BONNETT, DIRECTOR

217782-0610

February 19, 2016

Arnold Magnetic Technologies
770 Linden Avenue
Rochester, New York 14625

Re: Arnold Engineering Technologies - Marengo
Permit Log# 2015-60605
Denial of State Permit Application

Ms. Marion:

This Agency has reviewed your Application for Permit and the supporting documents for the subject project which were received on November 23, 2015. This Agency must deny the permit for this project for the following reasons.

Sections 12 and 39 of the Environmental Protection Act (Act), 415 ILCS 5/12 and 39, prohibit the Agency from issuing a permit for any facility which would threaten, cause or allow the discharge of contaminants which might cause or tend to cause water pollution in Illinois. Section 39 of the Act also requires an applicant to submit proof to the Agency that the proposed facility will not cause a violation of the Act or the regulations adopted pursuant to the Act.

In addition to the above cited Sections of the Act, the permit application does not fulfill the requirements of 35 Ill. Adm. Code 309.241.

Specifically, the reasons for Permit Denial are those outlined in the Public Notice of Denial which was previously transmitted to you.

Historic groundwater monitoring indicates exceedances for VOC's and some metals in the groundwater near the ponds. The application must address this groundwater contamination, and demonstrate that operation of the ponds has not and will not contribute to violations of the groundwater quality standards as found at 35 Ill. Adm. Code Part 620.

The Agency will be pleased to reevaluate your permit application on receipt of your written request and the necessary information and documentation to correct or clarify the deficiencies noted above. The revised application will be considered filed on the date that the Agency receives your written request.

You have the right to appeal this denial to the Illinois Pollution Control Board within a 35 day period following the date shown on this letter.

Should you have any questions or comments regarding the above, please contact Shu-Mei Tsai at 217/782-0610.

Sincerely,



Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:SMT: Log# 2015-60605 Arnold Engineering Technologies

cc: Des Plaines Region
Records Unit