National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **GM Powertrain Division**

Public Notice No.: 00-01-033
Public Notice Date: January 18, 2000
Comment Period Ends: February 17, 2000

OEPA Permit No.: **2IN00004*FD**
Application No.: **OH0002666**

Name and Address of Applicant:

GM Powertrain Division
P.O. Box 70
Defiance, Ohio 43512

Name and Address of Facility Where Discharge Occurs:

GM - Defiance Plant
SR 281 East
Defiance, Ohio 43512
Defiance County

Receiving Water: **Maumee River**

Subsequent Stream Network: **Lake Erie**

Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the

U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Water Resource Management Section
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

The application, fact sheet, public notice, permit including effluent limitations, special conditions, comments received and other documents are available for inspection and may be copied at a cost of 25 cents per page at the Ohio Environmental Protection Agency at the address shown above any time between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Copies of the Public Notice are available at no charge at the same address.

Location of Discharge/Receiving Water Use Classification

The GM - Defiance Plant discharges to the Maumee River at River Miles (RM) 62.04 (outfall 001) and 61.78 (002). The approximate location of the facility is shown in Figure 1.

This segment of the Maumee River is described by Ohio EPA River Code: 04-001, USEPA River Reach #: 04100009-009, County: Defiance, Ecoregion: Huron-Erie Lake Plain. The Maumee River is presently designated for the following uses: Warmwater Habitat (WWH), State Resource Water (SRW), Agricultural Water Supply (AWS), Industrial Water Supply (IWS) and Primary Contact Recreation (PCR). The Maumee River study area is shown in Figure 2.

Facility Description

GM manufactures gray and nodular iron castings for automobile and truck parts and industrial uses. The processes performed at GM are classified under the Standard Industrial Classification (SIC) Code 3321: Gray Iron Foundries. Process wastewaters from these operations are regulated by federal effluent guidelines for the Metal Molding and Casting Point Source Category (40 CFR 464). Specifically, Subpart C of the guidelines applies to the following process wastewaters: 1) Casting Cleaning/ Media Scrubber; 2) Dust Collection Scrubber; 3) Slag Quench; and 4) Melting Furnace Scrubber.

Description of Existing Discharge

Outfall 001 discharges process wastewater, cooling water and storm runoff. Most of the facility's wastewater (approximately 31 MGD) is recycled. Approximately 1.5 MGD is discharged from outfall 001. The effluent is treated by settling, ion exchange, precipitation, filtration and carbon adsorption.

Outfall 002 contains process and storm water, and discharges only during heavy storm events. Discharges from this outfall are considered to be bypasses, because the only treatment of these flows is settling.

Outfall 004 discharges storm water from a ditch on the west side of the property. Outfall 005 discharges storm runoff from the on-site solid waste landfill.

Tables 1-4 present a summary of analytical results for outfall 001-005 effluent samples compiled from the NPDES application, annual pretreatment reports submitted by the GM - Defiance Plant, and from bioassay tests done by Ohio EPA. The monthly average PEQ_{avg} and daily maximum PEQ_{max} decision criteria are also included on this table.

Table 5 presents a summary of unaltered monthly operation report data for the period January 1993 to June 1998 for the GM - Defiance Plant as well as current permit limits, and monthly average PEQ_{avg} and daily maximum PEQ_{max} values.

Table 6 presents results from acute bioassay tests conducted by Ohio EPA. Pimephales promelas (fathead minnows), and Ceriodaphnia dubia (water flea) were the test organisms.

Receiving Water Quality / Environmental Hazard Assessment

Assessment of Impact on Receiving Waters

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available water quality (water column, effluents, sediment, flows), biological (fish and macro invertebrate assemblages), and habitat data that have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio Water Quality Standards and Ohio EPA guidance documents. Other information that may be evaluated includes, but is not limited to, NPDES permittee self-monitoring data and effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

Ohio EPA relies on a tiered approach in attempting to link administrative activity indicators (*i.e.*, permitting, grants, enforcement) with true environmental indicators (*i.e.*, stressor, exposure, and response indicators). Stressor indicators generally include activities that have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Exposure indicators include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to stressor or bioaccumulative agents. Response indicators include the more direct measures of community and population response and are represented here by the biological indices that comprise Ohio EPA's biological criteria. The key is in using the different types of indicators within the roles that are the most appropriate for each. Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including the water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators.

Use attainment is a term that describes the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing use attainment status for aquatic life uses involves a primary reliance on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-17). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on the multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb) that indicate the response of the fish community, and the Invertebrate Community Index (ICI) that indicates the response of the macroinvertebrate community. Numerical endpoints are stratified by ecoregion, use designation, and stream or river size. Three attainment status results are possible at each sampling location - full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (see Tables 7 and 8) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.*, full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

General Motors Power Train (GMPT) Division - Defiance Plant (2IN00004)

GMPT is a production facility for the manufacturing of grey and nodular iron castings for automotive, truck and industrial uses. Industrial wastewater and stormwater runoff are collected and treated in Wastewater Treatment and Recycle (WTR) facilities which consist of a series of settling basins and a wastewater treatment plant. The WTR facilities are designed to maintain a supply of quality recycle water for plant use and to discharge excess treated water to the Maumee River through Outfall 001.

Wastewater consisting of contact cooling water and emissions control water is sent to the primary basins, where it flows by gravity to the reservoir. Any overflow from the primary basins goes to the secondary basins. The secondary basins receive non-contact cooling water, contact cooling water, emission control water, landfill leachate and stormwater runoff. Water from the secondary basins is pumped to the reservoir. The secondary basins are designed to contain stormwater from a 25 year-24 hour storm. Gravity overflow from the secondary basin discharges to the Maumee River through Outfall 002. A portion of the water from the reservoir is pumped to the production facilities for reuse, and the rest flows to the wastewater treatment plant for additional treatment prior to discharge or reuse. Treatment consists of the addition of sodium hydroxide and a polymer flocculent, and sand filtration. Water that is returned to the plant for reuse is passed through ion exchange softeners. Water that will be discharged to the Maumee River via Outfall 001 is further treated using ion exchangers to remove metals, and, if necessary, carbon adsorbers are used to remove phenols.

Monthly operating report (MOR) data was reviewed for 1997 permit compliance and to assess pollutant loading trends. Based on loadings data for GMPT's Outfall 001, the plant's contribution of TSS and phenol appears to have decreased dramatically since 1990. Loadings data for ammonia-N have only been available since 1994 and do not indicate any discernable trends to date.

In 1997 GMPT exceeded the permit limit for maximum concentration and average monthly phenol concentration in February. GMPT reported overflows from Outfall 002 on July 9,1997 and July 14, 1997. The 445,500 gallon overflow on July 9 occurred over a 4 hour period and was reported to be the result of heavy rainfall (4.74 inches July 7-9, 1997) when the plant was not in production. The July 14 overflow occurred over an 8½ hour period and spilled 25,500 gallons to the river.

Water column chemical analysis is confounded by the close proximity upstream of the City of Defiance WWTP effluent. The distance from the Defiance WWTP outfall downstream to that of GMPT is just over 100 meters. Consequently, evaluation of water quality in the vicinity of the GMPT outfall also reflects the immediate influence of the municipal WWTP. During the course of this investigation it was discovered that the City has been incorrectly sampling and thus providing misleading MOR information.

The City of Defiance WWTP discharges extremely poor quality effluent. In 1997 six effluent grab samples had ammonia concentrations ranging from 1.84 mg/l to 18.8 mg/l, nitrate concentrations ranging from 1.2 mg/l to 5.88 mg/l, and phosphorus concentrations ranging from 0.47 mg/l to 1.11 mg/l. Other parameter values were also elevated.

As the plume from the WWTP flows downstream it envelopes the GMPT outfall. Consequently, the additional load from GMPT is effectively masked by the relatively poorer effluent quality from the WWTP. Although the GMPT effluent also had some high parameter values with ammonia concentrations ranging from 0.47 mg/l to 1.32 mg/l, nitrate concentrations ranging from 2.0 mg/l to

4.67 mg/l, and phosphorus concentrations ranging from the method detection level to 0.44 mg/l, very few samples registered a downstream increase in any parameter concentration at the sites which bracketed the GMPT outfall.

The GMPT effluent flows into a background of nutrient enriched conditions. Whether GMPT further exacerbates these conditions is difficult to determine. High nutrient concentrations were recorded upstream from the Defiance WWTP, adjacent to the GMPT property, and continued downstream to the Independence dam.

Despite this nutrient load, all vicinity ambient daytime dissolved oxygen levels were above the warmwater habitat criterion (5 mg/l). Two GMPT effluent samples contained D.O. concentrations (3.4 mg/l and 4.0 mg/l) which were lower than this criterion. Values at the sites bracketing the outfall when the effluent D.O. concentrations were low were inconclusive regarding this influence.

Concentrations of fecal coliform bacteria were almost undetectable in the GMPT effluent. No bacteriological influence was attributed to GMPT.

Free cyanide and phenolics effluent concentrations were typically less than detection limits. One September sample did contain concentrations at levels just above detection limits. Downstream sample concentrations of these toxic compounds were typically less than detection limits although the same September sample run did register similar values just above detection limits. Total fluoride effluent concentrations ranged from 11.0 mg/l to 14.2 mg/l. Immediate downstream total fluoride concentrations were attributable to this source but were dissipated at the station one mile further downstream.

Sediment samples bracketing GMPT produced results consistent with background conditions. None of the metal concentrations exceeded slightly elevated levels. These results did not suggest any potential for aquatic life toxicity or reason for human health concern due to sediment contamination.

Bioassay results indicated the GMPT effluent was acutely toxic in two 1995 tests. Lethal effluent concentrations ranged from 35.4% to 46.0% . Chronic toxicity was inferred if the effluent would exceed a 3.7% instream concentration. Prior tests indicated some slight toxicity in 1986 but not in 1991.

Biological performance in the Maumee River in the Defiance area reflected the nutrient enriched conditions and was limited by habitat quality. Both the fish and macroinvertebrate communities exhibited poor characteristics at all sites impounded by the Independence Dam site. Upstream from the impoundment and from the City, fish community performance was fair while the macroinvertebrate community scored in the exceptional range. Likewise, downstream from the Dam and City, fish community performance improved to marginally good and the macroinvertebrate community was exceptional. As with the chemical analysis, precise interpretation of the influence of GMPT effluent on biological performance was masked by more pervasive impacts.

At the site upstream from the dam pool and at the next five subsequent upstream sites evaluated in 1997, macroinvertebrate performance was exceptional. Typically, many pollution sensitive taxa were collected at each of these locations. The presence of these taxa declined in the dam pool as more pollution tolerant red midges became predominant. In particular, the predominance of the red midge,

Glyptotendipes (G.) sp. was indicative of mild to moderately enriched conditions.

The poorest performance of the macroinvertebrate community was recorded within the Defiance WWTP mixing zone. The lowest taxa richness within the dam pool, the presence of only one pollution sensitive taxa, and the addition of the very pollution tolerant midge *Chironomus riparius* group as a predominant organism were indicative of increased enrichment and some mild toxicity.

The macroinvertebrate community within the GMPT mixing zone recovered to near the impoundment background conditions with expected taxa richness, the presence of three pollution sensitive taxa, and the replacement of the *Chironomus riparius* group with the pollution tolerant midge *Chironomus decorus* group as a predominant organism. The GMPT discharge was at most only slightly impacting the biological integrity of the macroinvertebrate community within the mixing zone. GMPT was not discharging at the time of sampling, however, there was a chemical smell in the area and occasionally an oily sheen would be released when the substrates were disturbed

The macroinvertebrate communities located opposite and downstream from the GMPT landfill were performing at a level comparable to the background conditions within the impoundment. This performance improved downstream from the dam to a level consistent with the performance recorded upstream from the impoundment. Clearly, the dam pool is a limiting factor to better macroinvertebrate community performance.

The marked decline within the impoundment was less apparent with the fish community. At the site immediately upstream from the dam pool, the fair fish community performance was better than at other 1997 upstream locations. Basin wide flow alterations resulting from tile installation and channel modification exacerbated by continuous enrichment were considered limiting factors to better upstream fish assemblages. Within the dam pool, fish community performance remained poor due to these and other upstream influences and due to the additional negative effects which impoundments exert on riverine assemblages.

Recognizing these degraded background conditions, no effect from either the Defiance WWTP or from GMPT was evidenced by the fish community. All dam pool sites were represented by fish assemblages which were predominated by pollution tolerant and omnivorous species. Round bodied suckers were essentially absent while the number of sunfish species increased within the pool. All samples were comprised of low biomass and relatively few fish. Other aspects of the fish community were consistent with upstream conditions.

Downstream from the Independence Dam the presence of a marginally good fish community was documented. This performance was as good or better than was recorded at all other upstream locations. The quality of this fish community and the significant improvement immediately downstream from the dam confirmed the ability of the fish assemblage in this reach to attain the biocriterion.

The inability of biological communities to attain warmwater habitat criteria within the impounded reaches of the Maumee River was previously documented. Biosurveys were conducted in 1984 and 1986 within the upper and lower reaches of the Maumee River, respectively. Performance in Maumee River dam pools by the fish community was poor to fair and the macroinvertebrate assemblage was also considered poor at that time.

Recognizing the investment made by the State of Ohio toward the perpetuation and maintenance of the Maumee River dams and the inability of biological communities to attain warmwater habitat criteria it is recommended that a more appropriate aquatic life use be designated for the impounded Maumee River reaches. The modified warmwater habitat aquatic life use designation is the appropriate expectation for the impounded reaches of the Maumee River. This use change is expected to be included in the 1999 Ohio EPA rule making.

Despite the severity of biological impairment in the dam pool where GMPT effluent enters the Maumee River, when the biological performance is gaged against the modified warmwater habitat use FULL attainment is registered. As such and lacking evidence of sediment contamination it is appropriate to accept the high risk category for further impairment from metals. Table 9 lists suggested biological threshold values for total recoverable cadmium, copper, lead and zinc for an ambient hardness of 246 mg/l.

Development of Water-Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

The Defiance WWTP is interactive with GM Defiance. A conservative wasteload allocation Ohio EPA model was used to allocate the loads between the two dischargers.

Parameter Selection

Effluent data for GMC Defiance was used to determine what parameters should undergo wasteload allocation. The sources of effluent data are as follows:

Self-monitoring data (LEAPS)	January 1992 through November 1997
Other data	1994 through 1996

The effluent data were checked for outliers and there were no extreme values to be eliminated. The average and maximum projected effluent quality (PEQ) values are presented in Table 11. For a summary of the screening results, refer to the parameter groupings at the end of this section.

Wasteload Allocation

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia toxicity	Average	Seasonal 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow
Wildlife		Annual 90Q10

Allocations are developed using a percentage of stream design flow (as specified in Table 11), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 12 and 13. The wasteload allocation results to maintain all applicable criteria are presented in Table 14.

Reasonable Potential

The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 4) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Table 15.

Dissolved Metals Translators

A dissolved metals translator (DMT) is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required in the NPDES permit process. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement. For the Maumee River, there were 6 such paired samples available applicable to cadmium, chromium, copper, lead, nickel, zinc and selenium. To account for the limited quantity of data, the DMT for each of these metals was determined as the lower end of the 95% confidence interval (1-tail) about the geometric mean of the total recoverable-to-dissolved ratios of the sample pairs. Each DMT is metal-specific and is applied by multiplying the dissolved criteria by the DMT, resulting in total effective recoverable criteria which can be used in the wasteload allocation procedures.

In some cases, it is possible that the use of a DMT may result in instream concentrations of metals that may increase the risk of non-attainment of the aquatic life use designation. This was evaluated for GMC Defiance. The application of the dissolved metal translators resulted in effective total recoverable criteria for cadmium, copper, lead, and zinc that were higher than the total recoverable criteria listed in OAC 3745-1. The Maumee River near GM Defiance is not attaining its designated use; however, the non-attainment can not be attributed to metals from GM Defiance. In addition, the facility has not requested any increase in permitted load. Therefore, the facility can receive permit limits that maintain all numeric criteria, up to their current limits, without undergoing any further review to ensure that the limits for the metals will protect the aquatic life and other uses.

Whole Effluent Toxicity

The allowable effluent toxicity (AET) is a factor considered in evaluating whole effluent toxicity. The AET calculations are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum). For GMC Defiance, the AET values are 1.0 TU_a and 3.48 TU_c.

Conclusions

The Maumee River in the vicinity of GMPT is an impounded, habitat degraded, enriched stream. The Defiance WWTP confounds this situation by delivering poor quality effluent to this reach. Biosurvey

results in 1997 provided no evidence that the GMPT effluent further degrades the degraded conditions.

Essentially, the background conditions in the Maumee River mask any environmental impact from GMPT. In the event that the pollution which enriches the Maumee River might be reduced and that improvements at the Defiance WWTP might occur, then a more robust analysis of the influence from this facility would be possible. As it is, the GMPT effluent has been documented to be sporadically toxic in moderate concentrations and some difficulty in meeting the NPDES permit limits for phenol was recorded. Efforts to remediate these concerns are warranted.

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Effluent Limits/Hazard Management Decisions

Permit limits must ensure that both federal effluent guideline limits, water-quality-based limits and other permitting requirements such as antibacksliding and antidegradation are met. None of the draft permit limits are based on BPT/BAT effluent limitations. The effluent guideline calculations are shown in Attachment 1.

Treatment-technology-based limits for the Metal Molding and Casting Point Source Category, found in 40 CFR Part 464, are based on the pounds of pollutant allowed to be discharged per ton of metal poured for casting cleaning and slag quench wastewaters. For the dust collection and melting furnace scrubbers, the discharge allowances are based on pounds of pollutant per billion standard cubic feet per minute of air processed by the scrubbers. The plant production rate used for the cleaning and quench calculations is 4370 tons poured per day (or 8.74 million pounds poured per day). Limits are calculated as follows: TSS limits (kg./day) = BCT (lbs./million lbs.) x production (million lbs./day) x 0.908 kg./lb.

Avg. TSS (casting cleaning):
0.67 lbs./million lbs. x 8.74 million lbs./day x 0.454 kg./lb. = 2.66 kg/day

Avg. TSS (slag quench):
2.73 lbs./million lbs. x 8.74 million lbs./day x 0.454 kg/lb. = 10.8 kg/day

The throughput rates for the scrubber systems are 1.50096 billion SCFM for the melting furnace scrubber and 63.128 billion SCFM for the dust collection scrubber. Limits for these wastestreams are calculated as follows: TSS limits (kg./day) = BCT (lbs./billion SCFM) x throughput (billion SCFM) x 0.908 kg./lb.

Avg. TSS (melting furnace scrubber):
52.6 lbs/billion SCFM x 1.50096 billion SCFM x 0.454 kg./lb. = 35.8 kg/day

Avg. TSS (dust collection scrubber):
11.3 lbs./billion SCFM x 63.128 billion SCFM x 0.454 kg./lb. = 323.9 kg/day

The total TSS allowance is the sum of the allowable loads for each operation, or 2.66 + 10.8 + 35.8 + 323.9 = 373.2 kg/day. The BCT guidelines for oil&grease, and the BAT guidelines for copper, lead, zinc and total phenolics can be used to calculate the allowable loadings of these pollutants as the example above has done for TSS. The complete listing of guideline calculations is in Attachment 1 of this fact sheet.

A number of the limits from the current permit are being carried over into this new draft. The current limits for TSS, oil&grease, lead, mercury (max.), zinc and phenolics are more restrictive than either effluent guidelines or WQBELs, and therefore must be applied to the new draft permit to satisfy the antibacksliding and antidegradation rules.

Limits proposed for pH are based on Water Quality Standards (OAC 3745-1).

The limits for chlorine, and the average limits for ammonia, mercury and selenium are based on the WLA and hazard assessment developed for this permit renewal.

The maximum ammonia limits are based on inside-mixing-zone maximum WQ criteria. These were calculated by determining the maximum ambient WQ criteria for the Maumee River from the Ohio WQS (OAC Rule 3745-1-07, Table 7-2). These were determined using the pH and temperature data used in the wasteload allocation. The ambient WQS were multiplied by two to determine the inside-mixing-zone maximum criteria, following state and federal criteria development procedures.

The maximum selenium limits that are in the current permit for GM are being removed in the final table, because the water quality standard that they are based on has been deleted from the Ohio WQS. The maximum selenium standards were based on USEPA criteria recommendations, which are currently under review at the federal level. USEPA's new draft criteria recommendations are based on separate criteria for the selenate and selenite forms of selenium. We have therefore included a special monitoring requirement for selenate and selenite in Part II K of the draft permit, so that data will be available to evaluate reasonable potential when the criteria recommendations become final. The maximum limits remain as interim limits, due to State and federal antibacksliding requirements.

The WLA for copper shows that limits of 53 ug/l (30-day) and 79 ug/l (daily) at the design flow conditions are necessary to meet WQS in the Maumee River. The concentration and loading limits have different bases in this case. The maximum concentration from the WLA is more restrictive than the limit in the current permit, and this WLA value is used in the draft permit. The loading limit that this concentration is based on is slightly higher than the current permit limit because a higher effluent flow rate was used for this renewal. Because GM has not requested additional loading in their application, the maximum loading from the current permit is being carried over to this draft renewal.

The average WLA is more restrictive than the current permit limit, and the loading limit from the WLA is being used in this renewal. However, the average concentration limit in the draft permit is 72 ug/l,

the previous permit limit. Ohio's rules allow facilities that use water conservation practices to have concentration and loading limits that have different bases, as long as the WLA is met (OAC Rule 3745-33-05(C)(1)(d)). GM's recycling of process wastewater is a water conservation practice; meeting the load limits based on the WLA ensure that the WLA is achieved. The higher 30-day concentration limit allows GM's effluent to be as high as 72 ug/l, as long as effluent flows are low enough to achieve the load limit at this concentration.

Cadmium and free cyanide are pollutants that are in the current permit, but were not identified as significant hazards by the reasonable potential procedures. These pollutants are still frequently present in the discharge, however, and monitoring is being retained in the permit at a lower frequency.

Molybdenum monitoring is required because the hazard assessment identified molybdenum as a Group 4 pollutant. All Group 4 pollutants must have permit monitoring requirements according to OAC Rule 3745-33-07(A)(2).

Barium and bis(2-ethylhexyl)phthalate were identified in the hazard assessment as having the reasonable potential to contribute to WQS exceedances; however, the effluent data set that was used to develop PEQ values was small, and may not be representative of the discharge. We are requiring monitoring only for these parameters until PEQ and reasonable potential can be reliably established. OAC Rule 3745-33-07(A)(5) allows such adjustments to the reasonable potential analysis.

The dioxin compound 2,3,7,8-TCDD was detected in the partially treated wastewaters that make up overflow outfall 002. The detection occurred using the less sensitive screening analytical method typically used for NPDES application testing. Due to this result, the draft permit contains a monitoring requirement for dioxin compounds at outfall 001 to determine if dioxin is being discharged at a concentration and frequency that may exhibit reasonable potential. Ohio EPA is not proposing limits at this time because the carbon filtration applied to outfall 001 (and not 002) will likely significantly reduce any dioxin present in the wastewater.

The WLA for the GM - Defiance Plant contains an additivity factor equation. Additivity is the combined toxic effect of carcinogenic pollutants. This section evaluates each quotient in the additivity factor equation to determine whether an additivity factor equation is necessary in the permit to limit the total carcinogen risk to 1×10^{-5} (1 in 100,000) or whether additivity is insignificant or "de minimis".

The additivity equation addresses carcinogens beryllium and bis(2-ethylhexyl)phthalate. In this case the WLAs to meet aquatic life WQS are more restrictive than the WLAs to meet human health, even including additivity of pollutant effects. In the additivity equation, if the aquatic life WLAs are placed in the space for effluent quality (that is, if the discharger were discharging at the aquatic life WLA), the additivity equation would equal a value less than 1.0. This indicates that the WLAs and reasonable potential analyses for aquatic life are more restrictive than additive human health limits, and therefore the additivity equation does not need to be considered further.

Whole Effluent Toxicity

Whole effluent toxicity or "WET" is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent. WET values are then compared to a calculated allowable effluent toxicity "AET" value. This comparison along with an

assessment of the instream community are two ways in which whole effluent toxicity is evaluated.

AET calculations are similar to aquatic life criteria wasteload allocation calculations. The $Q_{7,10}$ and chronic toxicity unit ($_{TUC}$) are used to calculated the average allowable AET and the $Q_{1,10}$ and acute toxicity unit (Tu_a) are used to calculate the maximum allowable AET. For the GM - Defiance Plant WWTP, the chronic AET is 3.48 $_{TUC}$ and acute AET is 1.0 TU_a.

The chronic toxicity unit ($_{TUC}$) is defined as 100 divided by the IC_{25}:

$$TU_c = \frac{100}{IC_{25}}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (Ceriodaphnia dubia only):

$$TU_c = \frac{100}{\text{geometric mean of NOEC and LOEC}}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the LC50 for the most sensitive test species:

$$TU_a = \frac{100}{LC50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

The assessment of toxicity is complicated in this case by the background habitat and nutrient impacts documented by the biological survey. The majority of environmental indicators show that the GM outfall 001 is a Category 2 hazard under the toxicity reasonable potential rules (OAC 3745-33-07(B)). The most descriptive indicators of this discharge are the biosurvey data and the maximum TU values. The fair/poor biological communities and the moderate level of AET exceedance indicates that the discharge should be in Category 2. These indicators provide important qualifications on the other indicators, which are based on a small amount of data (i.e. the average exceedance attribute) or provided variable results (different near-field mortality with roughly the same effluent toxicity).

As a result of this assessment, the permit contains a monitoring requirement for chronic toxicity, with acute endpoints calculated, and a plant performance evaluation to determine the causes of toxicity, and measures to reduce the toxicity to the WLA values. The Form 2C application submitted by GM indicates that this process has begun, and may have been completed; however, Ohio EPA has not received any further analysis or reports from GM on this process. Ohio EPA may revise the categorization after public notice if reports indicate that GM has achieved the WLA values for toxicity.

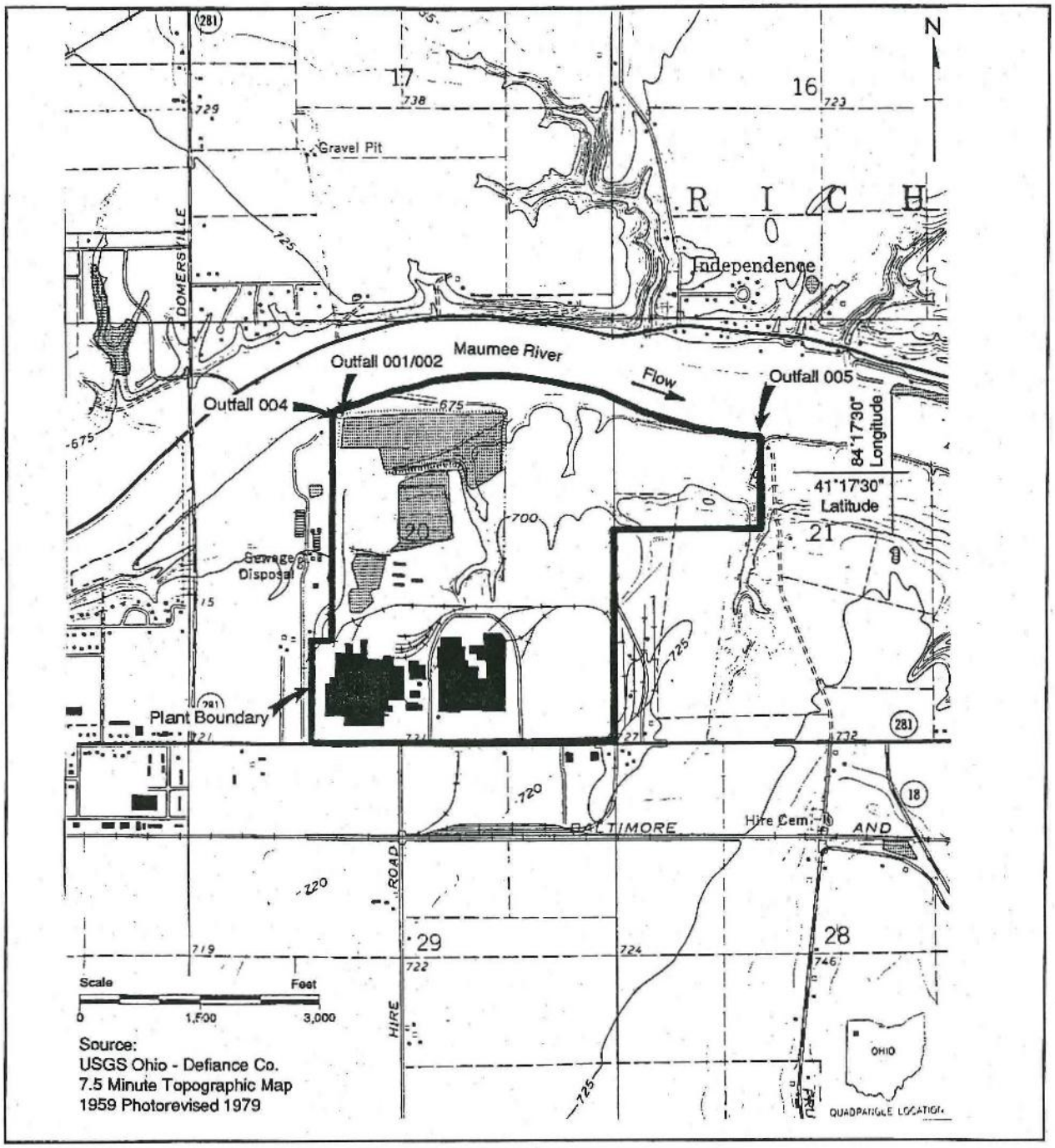

Figure 1. Approximate location of GM - Powertrain Division.

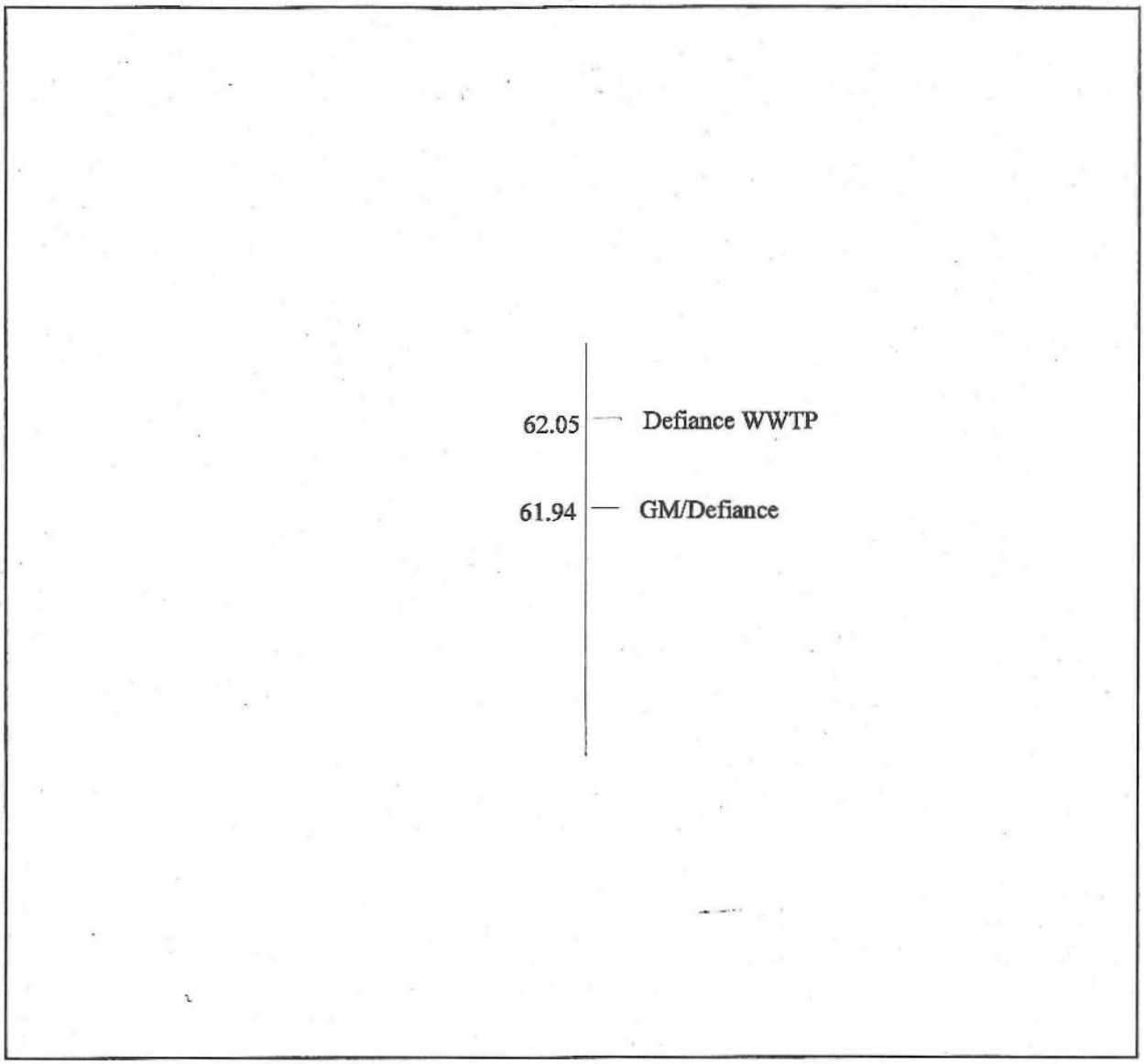

Figure 2. Maumee River - Defiance Study Area.

Table 1. Effluent Characterization and Decision Criteria

Summary of analytical results for GM/Defiance outfall 2IN00004 001. All values are in μg/l unless otherwise indicated. 2C = Data from application form 2C; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results. * = estimated concentration based on GC/MS computer match.

PARAMETER	Ohio EPA 10/24/95	Ohio EPA 12/12/95	GM 12/15/94	GM 06/21/95	GM 12/18/95	GM 06/12/96	GM 12/11/96	GM 06/24/97	DECISION CRITERIA PEQ_{avg}	DECISION CRITERIA PEQ_{max}
COD mg/l	37	35	114	36	92	33	77	38		
TDS mg/l	1070	1030	NA	NA	NA	NA	NA	NA		
TSS mg/l	<5	NA	1	1	1	2	4	2		
Ammonia-N mg/l	3.47	9.38	10.36	0.39	8.77	5.73	10.43	1.13	12.88	22.67
Chlorine mg/l	NA	NA	<0.01	0.05	<0.01	0.2	<0.01	0.1	0.036	0.046
F. coli #100 ml	NA	NA	<1	<1	4	<1	4	4		
Fluoride mg/l	NA	NA	20.55	26.04	14.25	11.01	14.47	15	39.9	54.7
Nitrate/Nitrite-N mg/l	NA	NA	9.74	9.19	3.13	2	0.8	3.66	14.9	20.5
TKN mg/l	NA	NA	<0.1	0.03	5.05	<0.1	1.55	0.24		
Oil+Grease mg/l	<1.0	<1.0	3	2	3	3	2	2		
Phosphorus mg/l	NA	NA	0.05	0.2	0.08	0.19	0.05	0.15		
Aluminum	NA	NA	<10	<10	<10	<10	300	<10	460	630
Barium	NA	NA	<10	<10	<10	<10	2365	<10	3626	4967
Boron	NA	NA	<10	24.3	45	10.1	95	<10	146	200

Table 17. Final effluent limits and monitoring requirements for GM Powertrain outfall 2IN00004002 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	----------	Monitor	----------		M[c]
Bypass duration	hr/day	----------	Monitor	----------		M[c]
Ammonia-N	mg/l	----------	Monitor	----------		M[c]
pH	S.U.	----------	6.5 to 9.0	----------		WQS
Copper, T. R.	µg/l	----------	Monitor	----------		M[c]
Lead, T. R.	µg/l	----------	Monitor	----------		M[c]
Mercury, T.R.	µg/l	----------	Monitor	----------		M[c]
Selenium, T. R.	µg/l	----------	Monitor	----------		M[c]
Zinc, T. R.	µg/l	----------	Monitor	----------		M[c]

[a] Effluent loadings are based on average design discharge flow of NA MGD.

[b] Definitions: M = Monitoring; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 16b. Con't.

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[a] Effluent loadings for ammonia, chlorine, copper, mercury and selenium based on average design discharge flow of 1.8 MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); BPJ = Best Professional Judgment; EP = Existing Permit; M = Monitoring; WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] This requirement applies to 2,3,7,8-TCDD equivalents. Monitoring is required for the following dioxin/dibenzofuran compounds: 2,3,7,8-TCDD; 1,2,3,7,8-PeCDD; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDD; 1,2,3,4,6,7,8-HpCDD; OCDD; 2,3,7,8-TCDF; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 2,3,4,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDF; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; and OCDF.

Table 16b. Final effluent limits and monitoring requirements for GM Powertrain outfall 2IN00004001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	Monitor				M[c]
Suspended Solids	mg/l	--	--	97.7	247	EP/ABS
Ammonia-N	mg/l					
Summer		10.6	18.2	72.2	124	WLA; WLA/IMZM
Winter		–	20.2	–	137	WLA/IMZM
Oil and Grease	mg/l	11.6	20	65.6	114	EP/ABS;BPJ/EP/ABS
pH	S.U.	6.5 to 9.0				WQS
Chlorine Residual	mg/l	0.032	0.038	0.22	0.22	WLA
Cyanide, Free	mg/l	Monitor				M[c]
Barium, T. R.	µg/l	Monitor				M[c]
Cadmium, T. R.	µg/l	Monitor				M[c]
Copper, T. R.	µg/l	72	79	0.36	0.52	EP,WLA;WLA
Lead, T. R.	µg/l	298	608	1.69	3.45	EP/ABS
Mercury, T.R.	µg/l	.006	1.5	0.000041	0.0085	WLA;EP/ABS
Molybdenum, T.R.	µg/l	Monitor				M[c]
Selenium, T. R.	µg/l	14	--	0.095	–	WLA
Zinc, T. R.	µg/l	424	520	2.41	2.9	EP/ABS
Phenolics, Total	µg/l					
Summer		--	--	0.33	0.50	EP/ABS
Winter		--	--	1.63	4.65	EP/ABS
2,3,7,8-TCDD[d]	pg/l	Monitor				M[c]
Bis(2-ethylhexyl) phthalate	µg/l	Monitor				M[c]
Whole Effluent Toxicity						
Acute	TUa	Monitor (w/ PPE)				WET
Chronic	TUC	Monitor (w/ PPE)				WET

Table 16a. Con't.

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[a] Effluent loadings for ammonia, chlorine, copper, mercury and selenium based on average design discharge flow of 1.8 MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); BPJ = Best Professional Judgment; EP = Existing Permit; M = Monitoring; WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] This requirement applies to 2,3,7,8-TCDD equivalents. Monitoring is required for the following dioxin/dibenzofuran compounds: 2,3,7,8-TCDD; 1,2,3,7,8-PeCDD; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDD; 1,2,3,4,6,7,8-HpCDD; OCDD; 2,3,7,8-TCDF; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDF; 2,3,4,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDF; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8,9-HpCDF; and OCDF.

Table 16a. Interim effluent limits and monitoring requirements for GM Powertrain outfall 2IN00004001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	Monitor				M[c]
Suspended Solids	mg/l	--	--	97.7	247	EP/ABS
Ammonia-N	mg/l					
Summer		Monitor				M[c]
Winter		Monitor				M[c]
Oil and Grease	mg/l	11.6	20	65.6	114	EP/ABS;BPJ/EP/ABS
pH	S.U.	6.5 to 9.0				WQS
Chlorine Residual	mg/l	0.032	0.038	0.22	0.22	WLA
Cyanide, Free	mg/l	Monitor				M[c]
Barium, T. R.	µg/l	Monitor				M[c]
Cadmium, T. R.	µg/l	Monitor				M[c]
Copper, T. R.	µg/l	72	79	0.36	0.52	EP,WLA;WLA
Lead, T. R.	µg/l	298	608	1.69	3.45	EP/ABS
Mercury, T.R.	µg/l	0.8	1.5	0.004	0.0085	EP/ABS
Molybdenum, T.R.	µg/l	Monitor				M[c]
Selenium, T. R.	µg/l	--	40	--	0.23	EP/ABS
Zinc, T. R.	µg/l	424	520	2.41	2.9	EP/ABS
Phenolics, Total	µg/l					
Summer		--	--	0.33	0.50	EP/ABS
Winter		--	--	1.63	4.65	EP/ABS
2,3,7,8-TCDD[d]	pg/l	Monitor				M[c]
Bis(2-ethylhexyl) phthalate	µg/l	Monitor				M[c]
Whole Effluent Toxicity						
Acute	TUa	Monitor (w/ PPE)				WET
Chronic	TUc	Monitor (w/ PPE)				WET

Table 15. Parameter Assessment (cont.)

Additivity of carcinogens. Following are the human health limits for the carcinogens:

Substance	Parameter	Limits for Human Health (ug/l)
A	bis (2-Ethylhexyl) phthalate	442
B	Beryllium	7789

The following equation will be used to calculate the additivity factor:

$$\frac{MAC_A}{442 \text{ ug/l}} + \frac{MAC_B}{7789 \text{ ug/l}} \leq 1.0$$

Table 15. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time. The facility may be required to generate toxicity data so that the parameters may be reevaluated.

Ammonium nitrate	Cyanide, amenable	Nitrate
Ammonium sulfate	Dichlorodifluoromethane	Phenolic, 4AAP
Bromide	Formaldehyde	Sulfate
Chloride	Magnesium	Sulfide

Group 2: PEQ < 25% of WQS or all data below minimum detection limit; WLA not required. No limit recommended, monitoring optional.

Boron	Benzene	Cyanide, total
NO2+NO3	Naphthalene	Phenol
Aluminum	Iron	Trichloroethylene

Group 3: PEQ_{max} < 50% of maximum PEL and PEQ_{avg} < 50% of average PEL. No limit recommended, monitoring optional.

Arsenic	Beryllium	Nickel
Cadmium	Cyanide, free	2,4 Dimethylphenol
Lead	Manganese	Pyrene
Zinc	Tin	Fluoride
Di-n-butylphthalate		

Group 4: $PEQ_{max} \geq 50\%$ but <100% of the maximum PEL or $PEQ_{avg} \geq 50\%$ but < 100% of the average PEL. Monitoring is appropriate.
Molybdenum

Group 5: Maximum PEQ $\geq$ 100% of the maximum PEL or average PEQ $\geq$ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Period	Applicable	Recommended Effluent Limits Average	Maximum
Ammonia	mg/l	summer		10.6	--
Ammonia	mg/l	winter		secondary	--
Barium	ug/l	annual		2775	4000
Bis (2-ethylhexyl) phthalate	ug/l	annual		24	2100
Chlorine, total residual	ug/l	summer		32	38
Copper	ug/l	annual		53	79
Mercury	ug/l	annual		.006	3.4
Selenium	ug/l	annual		14	-

Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average				Maximum	Inside
		Human Health	Agri Supply	Wild-life	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Ammonia (summer)	mg/l	--	--	--	10.6	--	--
Ammonia (winter)	mg/l	--	--	--	C	--	--
Arsenic	ug/l	34573[A]	5815[A]	--	680[A]	680[A]	680
Barium	ug/l	9.59E6[A]	--	--	2775	55871[A]	4000
Beryllium	ug/l	7789[A]	--	--	593	11174[A]	790
Bis (2-EHP)	ug/l	442	--	--	24	2100[A]	2100
Cadmium	ug/l	10080[A]	688[A]	--	18[B]	33[AB]	33[B]
Chlorine, total residual	ug/l	--	--	--	32	38[A]	38
Copper	ug/l	883800[A]	6793[A]	--	53[B]	79[AB]	79[B]
Cyanide, free	ug/l	2.88E6[A]	--	--	66[A]	615[A]	44
Di-n-butylphthalate	ug/l	1857	--	--	--	--	--
2,4 Dimethylphenol	ug/l	521249[A]	--	--	189	3911[A]	280
Fluoride	ug/l	--	119827	--	--	--	--
Lead	ug/l	2591	1348	--	286[B]	3900[AB]	3900[B]
Manganese	ug/l	3.65E6[A]	--	--	2270	44696[A]	3200
Mercury	ug/l	.043	138[A]	0.006	2.6	3.4[A]	3.4
Molybdenum	ug/l	599137[A]	--	--	1387	67045[A]	4700
Nickel	ug/l	593600[A]	2455[A]	--	332[B]	2400[AB]	2400[B]
Pyrene	ug/l	899[A]	--	--	58	1173[A]	83
Selenium	ug/l	42810	691	--	14[B]	--	--
Tin	ug/l	--	--	--	2270	44696[A]	3200
Zinc	ug/l	2.1E6[A]	1.5E6[A]	--	1500[AB]	1500[AB]	1500[B]

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] WLA based on applicable dissolved metal translator.
[C] WLA exceeds secondary treatment so secondary is appropriate.

Table 13. Instream Conditions and Discharger Flow (cont.)

Parameter	Units		Value	Basis
Dissolved Metal Translators				
Cadmium			1.418	OEPA, 6 values, 0<MDL, 1997
Chromium			3.506	OEPA, 6 values, 0<MDL, 1997
Copper			1.257	OEPA, 6 values, 0<MDL, 1997
Lead			6.426	OEPA, 6 values, 0<MDL, 1997
Nickel			1.203	OEPA, 6 values, 0<MDL, 1997
Selenium			1.025	OEPA, 6 values, 0<MDL, 1997
Zinc			2.972	OEPA, 6 values, 0<MDL, 1997
Defiance WWTP flow	cfs	current	6.19	DSW
	cfs	expanded	9.28	DSW
GM Defiance	cfs		2.78	DSW

* Flows were calculated for using records for the following gages; USGS #04183500, #04191500, #04185000, and # 04193500.

Table 13. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
7Q10	cfs	annual	92.	*
1Q10	cfs	annual	65.6	*
90Q10	cfs	annual	188.	*
Harmonic Mean Flow	cfs	annual	618.	*
30Q10	cfs	summer	132.	*
	cfs	winter	268.	*
Mixing Assumption	%	average	25.	Chronic criteria default
	%	maximum	100.	Stream-to-discharge ratio
Instream pH	S.U.	summer	8.0	LEAPS; 103 values, 1992-97
		winter	8.0	LEAPS; 64 values, 1992-97
Instream Temperature	°C	summer	24.0	LEAPS; 105 values, 1992-97
		winter	4.0	LEAPS, 65 values, 1992-97
Instream Hardness	mg/l	annual	246.	LEAPS; 70 values, 0<MDL, 1992-97
Background Water Quality				
Ammonia (summer)	mg/l	annual	0.12	LEAPS; 105 values, 0<MDL, 1992-97
Ammonia (winter)	mg/l	annual	0.12	Assumed equal to summer
Arsenic	ug/l	annual	1.8	STORET; 5 values, 2<MDL, 1984
Barium	ug/l	annual	0	No representative data available
Beryllium	ug/l	annual	0	No representative data available
Bis (2-EHP)	ug/l	annual	0	No representative data available
Cadmium	ug/l	annual	0.19	STORET; 7 values, 3<MDL, 1984-86
Chlorine, total residual	ug/l	annual	0	No representative data available
Copper	ug/l	annual	8.8	STORET; 8 values, 4<MDL, 1984-86
Cyanide, free	ug/l	annual	0	No representative data available
Di-n-butylphthalate	ug/l	annual	0	No representative data available
2,4 Dimethylphenol	ug/l	annual	0	No representative data available
Fluoride	ug/l	annual	0	No representative data available
Lead	ug/l	annual	2.6	STORET; 7 values, 0<MDL, 1984-86
Manganese	ug/l	annual	0	No representative data available
Mercury	ug/l	annual	0	No representative data available
Molybdenum	ug/l	annual	0	No representative data available
Nickel	ug/l	annual	24	STORET; 8 values, 7<MDL, 1984-86
Pyrene	ug/l	annual	0	No representative data available
Selenium	ug/l	annual	0	No representative data available
Tin	ug/l	annual	0	No representative data available
Zinc	ug/l	annual	13	STORET; 8 values, 3<MDL, 1984-86

Table 12. Water Quality Criteria in the Study Area

		Outside Mixing Zone Criteria					
		Average				Maximum	Inside Mixing
Parameter	Units	Human Health [A]	Wildlife	Agri-culture	Aquatic Life [A]	Aquatic Life [A]	Zone Maximum [A]
Aluminum	ug/l	4500[B]	--	--	--	--	--
Ammonia (summer)	mg/l	--	--	--	1.0	--	--
Ammonia (winter)	mg/l	--	--	--	3.3	--	--
Arsenic	ug/l	580	--	100	150	340	680
Barium	ug/l	160000	--	--	220[B]	2000[B]	4000[B]
Benzene	ug/l	310[D]	--	--	160[B]	700[B]	1400[B]
Beryllium	ug/l	130[D]	--	--	47[B]	400[B]	790[B]
Bis (2-ethylhexyl) phthalate	ug/l	32[D]	--	--	8.4[B]	1100[B]	2100[B]
Boron	ug/l	200000	--	--	950[B]	8500[B]	17000[B]
Cadmium	ug/l	730	--	50	6.4[C]	17[C]	33[C]
Chlorine, total residual	ug/l	--	--	--	11	19	38
Copper	ug/l	64000	--	500	24[C]	39[C]	79[C]
Cyanide, free	ug/l	48000	--	--	5.2	22	44
Cyanide, total	ug/l	48000	--	--	--	--	--
Di-n-butylphthalate	ug/l	31[B]	--	--	--	--	--
2,4 Dimethylphenol	ug/l	8700	--	--	15[B]	140[B]	280[B]
Fluoride	ug/l	--	--	2000	--	--	--
Iron	ug/l	--	--	5000	---	--	--
Lead	ug/l	190	--	100	100[C]	2000[C]	3900[C]
Manganese	ug/l	61000	--	--	180[B]	1600[B]	3200[B]
Mercury	ug/l	0.0031	0.0013	10	0.91	1.7	3.4
Molybdenum	ug/l	10000	--	--	110[B]	2400[B]	4700[B]
Naphthalene	ug/l	1200	--	--	21[B]	160[B]	320[B]
Nickel	ug/l	43000	--	200	130[C]	1200[C]	2400[C]
NO2+NO3	ug/l	--	--	100000	--	--	--
Phenol	ug/l	2400 [B]	--	--	--	--	--
Pyrene	ug/l	15	--	--	4.6[B]	42[B]	83[B]
Selenium	ug/l	3100	--	50	4.7[C]	--	--
Tin	ug/l	--	--	--	180[B]	1600[B]	3200[B]
Trichloroethylene	ug/l	370[D]	--	--	220[B]	2000[B]	4000[B]
Zinc	ug/l	35000	--	25000	750 [C]	750 [C]	1500 [C]

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated.

[B] Tier II criterion.

[C] Total effective criteria based on application of a dissolved metal translator (DMT).

[D] Carcinogen

Table 11. Effluent Data for GMC Defiance (cont.)

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Pyrene	ug/l	8	1	25	34.2
Sulfate	ug/l	6	6	673524	922635
Sulfide	ug/l	6	3	1380	1890
Tin	ug/l	6	1	307	420
Trichloroethylene [A]	ug/l	8	1	19.4	26.6

[A] Carcinogen

Table 11. Effluent Data for GMC Defiance

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
LEAPS Data					
Ammonia (summer)	mg/l	18	18	12.885	22.67
Ammonia (winter)	mg/l	10	10	18.485	35.144
Cadmium	ug/l	182	56	5.6668	7.5494
Chlorine, total residual	mg/l	174	29	0.0357	0.046
Copper	ug/l	263	2	111.69	153
Cyanide, free	mg/l	184	48	0.0131	0.0197
Lead	ug/l	262	10	69.453	102.61
Mercury	ug/l	268	9	0.1101	0.1508
Phenolic 4AAP	ug/l	266	266	45.204	66.61
Selenium	ug/l	174	105	83.109	86.841
Zinc	ug/l	266	265	315.44	452.14
Other Data					
Aluminum	ug/l	6	1	460	630
Amenable cyanide	ug/l	6	1	18.4	25.2
Ammonium nitrate	ug/l	6	5	2177	2982
Ammonium sulfate	ug/l	6	5	4722	6468
Arsenic	ug/l	6	5	62	84
Barium	ug/l	6	1	3626	4967
Benzene [A]	ug/l	8	1	1.25	1.71
Beryllium [A]	ug/l	6	1	32	44
Bis (2-ethylhexyl) phthalate [A]	ug/l	8	1	38.8	53.2
Boron	ug/l	6	4	146	200
Bromide	ug/l	6	3	1671	2289
Chloride	ug/l	6	6	511593	700812
Cyanide, total	ug/l	6	3	123	168
Dichlorodifluoromethane	ug/l	8	1	11.1	15.2
Di-n-butylphthalate	ug/l	8	1	22.2	30.4
2,4 Dimethylphenol	ug/l	8	2	71	97
Formaldehyde	ug/l	6	4	1487	2037
Fluoride	ug/l	6	6	39919	54684
Iron	ug/l	6	4	300	412
Magnesium	ug/l	6	6	24312	33304
Manganese	ug/l	6	6	647	886
Molybdenum	ug/l	6	3	730	1000
Naphthalene	ug/l	8	1	3.9	5.3
Nickel	ug/l	8	3	154	211
Nitrate	ug/l	3	2	6614	9060
NO2+NO3	ug/l	6	6	14931	20454
Phenol	ug/l	8	1	74	102

Table 10. Ohio EPA, Division of Emergency and Remedial Response, records of pollution spills suspected to have originated from GM - Defiance Plant during 1988-98.

DATE	WATERBODY AFFECTED	SUSPECTED POLLUTANT	AMOUNT SPILLED	AMOUNT RECOVERED
08/18/88	site grounds	oil	unknown	NR
06/30/89	Maumee River	process water	55 MGD	none
10/20/89	Maumee R. trib.	mercury	NR	NR
02/23/90	Maumee River	cooling water/ rain water	4 MGD	none
08/27/90	Maumee River	wastewater	NR	NR
12/31/90	Maumee River	recycle water	NR	NR
08/08/91	Maumee River	mercury	NR	NR
09/23/91	Maumee River	mercury	NR	NR
10/02/91	Maumee River	mercury	NR	NR
03/03/92	Maumee R. trib.	mercury	NR	NR
05/13/92	Maumee River	metallic dust	NR	NR
06/17/92	Maumee River	metallic dust	NR	NR
02/02/96	Maumee River	wastewater	NR	NR
07/09/97	Maumee River	wastewater	NR	NR
03/03/98	Maumee River	wastewater	NR	NR
04/20/98	Maumee River	wastewater	NR	NR

Table 9.

Suggested limits for total recoverable metals for GMPT based on accepting a high risk of further impairment to the biological communities for boat type streams in the HELP ecoregion.

Biological Threshold to Protect Aquatic Life Uses	Total Recoverable Criteria From Table 33-1 of the WQS	Ambient Hardness in mg/l (from Modelers)
TR_Cd	Cd_WQS	
4.66	5.01	246
TR_Cu	Cu_WQS	
114.48	20.20	246
TR_Pb	Pb_WQS	
62.45	20.30	246
TR_Zn	Zn_WQS	
629.84	257.78	246

Table 8.

Narrative ranges, WWH biocriteria (bold) and MWH biocriteria (bold) for the Huron Erie Lake Plain (HELP) ecoregion. Exceptional (EWH biocriteria), very good (EWH nonsignificant departure), poor and very poor evaluations are common statewide. For WWH, the range of nonsignificant departure is noted.

Warmwater Habitat			
IBI	**MIwb**	**ICI**	**Narrative Evaluation**
Boat	Boat	All	
48-60	≥9.6	46-60	Exceptional
44-47	9.1-9.5	42-44	Very Good
Huron Erie Lake Plain			
38-43	**8.6**-9.0	**34**-40	Good
34-37	8.1-8.5	30-32	Marginally Good
26-33	6.4-8.0	14-28	Fair
30-33	8.1-8.5	30-32	Nonsignificant Departure
16-25	5.0-6.3	2-12	Poor
12-15	0-4.9	<2	Very Poor
Modified Warmwater Habitat			**Type**
20	**5.7**	**22**	Channel Modified
22	**5.7**	NA	Impounded

Table 7. Warmwater habitat aquatic life use attainment status for stations sampled in the Maumee River in the Defiance Ohio area, 1997. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support a biotic community.

RIVER MILE Fish/Invert.	IBI	MIwb	ICI[a]	QHEI	Attainment Status[b]	Site Location
Maumee River		*Huron Erie Lake Plain (HELP) - WWH Use Designation*				
69.0/ 69.3	29*	7.6*	56	72.5	PARTIAL	Ust. Defiance from Switzer Rd.
	HELP-WWH Use Designation (Existing)/ MWH Use Designation (Recommended)					
62.4/ 62.1	19*	6.3*	P	60.5	**NON/ PARTIAL**	Upstream SR 281
62.0/ 62.02	*27*	*7.9*	*P*	--	*NA*	*Defiance WWTP mixing zone*
61.9 /61.90	*24*	*7.0*	*P*	--	*NA*	*G.M. mixing zone*
61.8/ 60.90	25*	6.7*	P	61.5	**NON/ FULL**	Adjacent G.M. Landfill
61.7/ 61.2	21*	6.5*	P	61.5	**NON/ PARTIAL**	Opposite G.M. Landfill
60.4	23*	7.2*	--	62.5	**NON/ FULL**	Ust. Independence Dam
	HELP-WWH Use Designation					
58.5/ 58.1	30[ns]	8.5[ns]	50	90.5	FULL	Downstream Independence Dam

* Significant departure from ecoregion biocriterion; poor and very poor results are underlined.

ns Nonsignificant departure from biocriterion ($\leq$4 IBI or ICI units; $\leq$0.5 MIwb units).

a Narrative evaluation used in lieu of ICI (E=Exceptional; G=Good; MG=Marginally Good; F=Fair; P=Poor). Shaded area indicates an impounded reach; macroinvertebrate scores are not applicable to attainment status.

b Use attainment status determined without an applicable organism group is parenthetically expressed.

NA Attainment status is not applicable in mixing zones.

Table 6. Summary of ACUTE toxicity test results on the GM Powertrain effluent from outfall 2IN00004001.

TEST DATE(a)	*Ceriodaphnia dubia 48 hour*						*Fathead Minnows 48 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[i]	TUa[g]	NF[h]	UP[b]	C[c]	LC_{50}[d]	%M[i]	TUa[g]	NF[h]
10/24/95(O)	0	0	38.1	100	2.6	35	0	0	46.0	100	2.2	10
12/12/95(O)	0	0	35.4	100	2.8	0	0	0	$\geq$100	10-50	$\leq$1.0	0

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = Median Lethal Concentration
[e] EC_{50} = Median effects concentration
NT = not tested

[f] %A = Percent Adversely Affected in 100% effluent
[g] TUa = Acute Toxicity Units
[h] NF = Near Field Sample In the Maumee River
[i] %M = Percent Mortality in 100% effluent
ND = not determined

RESIDUE TOT NFLT	ANNUAL	MG/L	17.2	43.5	243	1	5	0-12			
		KG/DAY	97.7	247	243	4.6783	30.674	0-82.483			
SELENIUM TOT REC	ANNUAL	UG/L	-	40	204	1	37	0-95	105	83	87
		KG/DAY	--	0.23	204	0.00606	0.20515	0-0.5391			
ZINC TOT REC	ANNUAL	UG/L	424	520	210	170	380	0-500	266	315	452
		KG/DAY	2.41	2.9	210	0.81729	2.1614	0-3.7377			

** Phenolics Limits
summer 58 ug/l (30-day), 88 ug/l (daily)
0.33 kg/day (30-day), 0.50 kg/day (daily)
winter 287 ug/l (30-day), 819 ug/l (daily)
1.63 kg/day (30-day), 4.65 kg/day (daily)

GM/DEFIANCE (2IN00004) *OUTFALL=002*

			CURRENT PERMIT		PERIOD = JUL97 THRU APR98			
PARAMETER	**SEASON**	**UNITS**	**30 DAY**	**DAILY**	**N**	**50 PCTL**	**95 PCTL**	**RANGE**
BYPASS TOT	ANNUAL	HRS/DAY	Monitor		7	7	8.5	1.5-8.5
CONDUIT FLOW	ANNUAL	MGD	Monitor		7	0.02	0.445	0.002-0.445
COPPER TOT REC	ANNUAL	UG/L	Monitor		5	0	0	0-0
LEAD TOT REC	ANNUAL	UG/L	Monitor		5	0	0	0-0
MERCURY TOT REC	ANNUAL	UG/L	Monitor		5	0	0	0-0
PH	ANNUAL	S.U.	6.5 to 9.0		5	7.2*	7.9	7.2-7.9
ZINC TOT REC	ANNUAL	UG/L	Monitor		5	880	1790	620-1790
		KG/DAY	--	--	5	0.00666	0.1355	0-0.1355

GM/DEFIANCE (2IN00004) *OUTFALL=004*

			CURRENT PERMIT		PERIOD = JAN93 THRU SEP93			
PARAMETER	**SEASON**	**UNITS**	**30 DAY**	**DAILY**	**N**	**50 PCTL**	**95 PCTL**	**RANGE**
CONDUIT FLOW	ANNUAL	MGD	--	--	273	0.06	0.1	0-0.29

Table 5. Effluent Characterization and Decision Criteria

Summary of current permit limits and unaltered monthly operating report (MOR) data for GM Powertrain outfalls 001, 002 and 004. All values are based on annual records unless otherwise indicated. N = Number of Analyses. * = For pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; A = 7 day average. Decision Criteria: PEQ_{ave} = monthly averages; PEQ_{max} = daily maximum analytical results.

GM/DEFIANCE (2IN00004) *OUTFALL=001*

			CURRENT PERMIT		PERIOD = JAN93 THRU JUN98				DECISION CRITERIA		
PARAMETER	SEASON	UNITS	30 DAY	DAILY	N	50 PCTL	95 PCTL	RANGE	N	PEQavg	PEQmax
AMMONIA NH3-N	MAY-OCT	MG/L	Monitor		28	3.02	9.05	0.2-10.24	18	12.88	22.67
		KG/DAY	--	--	28	13.078	49.431	1.0871-57.856			
	NOV-APR	MG/L	Monitor		26	7.13	13.09	1.42-14.86	10	18.49	35.14
		KG/DAY	--	--	26	38.148	75.606	5.7717-75.762			
BOD 5 DAY	NOV-APR	MG/L	--	--	2	2	7	2-7			
		KG/DAY	--	--	2	0.1514	0.5299	0.1514-0.5299			
CADMIUM TOT REC	ANNUAL	UG/L	Monitor		212	0	6	0-18	182	5.7	7.5
		KG/DAY	--	--	212	0	0.02406	0-0.0773			
CHLORINE TOT RESD	ANNUAL	MG/L	--	0.038	206	0	0.03	0-0.11	174	0.04	0.05
		KG/DAY	--	0.22	206	0	0.13293	0-0.5461			
CONDUIT FLOW	ANNUAL	MGD	Monitor		1785	1.087	2.203	0-3.781			
COPPER TOT REC	ANNUAL	UG/L	72	92	204	0	0	0-170	263	111	153
		KG/DAY	0.41	0.52	204	0	0	0-1.1975			
CYANIDE FREE	ANNUAL	MG/L	-	0.092	213	0	0.019	0-0.031	184	0.13	0.20
		KG/DAY	--	0.52	213	0	0.0869	0-0.213			
LEAD TOT REC	ANNUAL	UG/L	298	608	203	0	0	0-190	262	69.5	103
		KG/DAY	1.69	3.45	203	0	0	0-1.5145			
MERCURY TOT REC	ANNUAL	UG/L	0.8	1.5	38	0	0	0-1	268	0.11	0.15
		KG/DAY	0.004	0.0085	38	0	0	0-0.0009			
		UG/L	0.8	1.5	211	0	0	0-0.84	268	0.11	0.15
		KG/DAY	0.004	0.0085	211	0	0	0-0.0039			
OIL GRSE TOT	ANNUAL	MG/L	11.6	20	250	2	5	0-18			
		KG/DAY	65.6	114	250	7.1272	27.502	0-68.069			
PH	ANNUAL	S.U.	6.5 to 9.0		250	7.4*	8.7	7.2-8.9			
PHENOLIC 4AAP TOT	ANNUAL	UG/L	**	**	246	9	125	0-1440	266	45	67
		KG/DAY	**	**	246	0.04326	0.60832	0-7.2381			

Table 4. Continued.

PARAMETER		GM 12/14/94	GM 12/14/95	GM 06/12/96	GM 12/16/96	GM 06/24/97
Arsenic		3.1	27.1	13.6	1.0	1.0
Beryllium	<2	<2	11	<2	<2	
Cadmium		5	<3	<3	<3	<3
Copper		<5	<5	<5	<5	56
Lead		11	<10	<10	<10	<10
Nickel		<10	<10	<10	46	<10
Selenium		1.9	2.1	22.5	<0.5	<0.5
Zinc		115	64	16	120	36
Total Phenolics		<2	100	60	70	<2
Benzene		<5	<5	<5	<5	6
Toluene		<5	8	<5	<5	22
Phenol		<25	<25	<25	27	<25
Diethylphthalate		<10	<10	<10	16	<10
Formaldehyde		<0.1	160	70	40	300
2-Methylphenol		NA	6	<5	<5	<5

Table 4. Effluent Characterization and Decision Criteria

Summary of analytical results for GM/Powertrain outfall 005. All values are in μg/l unless otherwise indicated. PT = data from, pretreatment program reports; 2C = Data from application form 2C; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed.

PARAMETER	GM 12/14/94	GM 12/14/95	GM 06/12/96	GM 12/16/96	GM 06/24/97
COD mg/l	51	222	44	29	34
TSS mg/l	28	127	18	60	14
Ammonia-N mg/l	2.38	7.19	4.44	0.72	0.22
Chlorine mg/l	<0.01	<0.01	0.18	0.33	0.10
F. coli #100 ml	10	<1	100	<1	220
Fluoride mg/l	2.67	4.92	4.24	2.25	1.52
Nitrate/Nitrite-N mg/l	0.83	0..65	0.10	1.47	<0.10
TKN mg/l	6.38	3.67	1.09	3.32	0.36
Oil+Grease mg/l	2	3	2	1	3
Phosphorus mg/l	0.04	0.39	0.16	0.27	0.11
Sulfide mg/l	0.7	<0.1	<0.1	0.4	0.1
Aluminum	209	<10	199	577	<10
Barium	<20	<20	908	376	<10
Boron	<10	<10	<10	4	<10
Iron	1355	3399	241	3577	241
Molybdenum	89	<10	<10	44	<10
Manganese	831	246	31	251	412
Antimony	<10	<10	157	<10	<10

Table 3. Continued.

PARAMETER	GM 12/14/94	GM 12/13/95	GM 06/12/96	GM 12/11/96	GM 06/23/97
Selenium	5.7	1.3	14.6	<0.5	<0.5
Zinc	92	21	43	89	55
Cyanide, Total	10	<2	<2	<2	<2
Total Phenolics	100	50	70	<2	80
Trichlorofluoromethane	<3	<3	9	<3	<3
4-Nitrophenol	<25	<25	31	<25	<25
Di-n-octyl-phthalate	<10	<10	<10	11	<10
Formaldehyde	<0.1	100	60	50	320

Table 3. Effluent Characterization and Decision Criteria

Summary of analytical results for GM Powertrain outfall 004. All values are in μg/l unless otherwise indicated. PT = data from, pretreatment program reports; 2C = Data from application form 2C; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed.

PARAMETER	GM 12/14/94	GM 12/13/95	GM 06/12/96	GM 12/11/96	GM 06/23/97
COD mg/l	30	31	27	26	34
TSS mg/l	40	1	18	24	31
Ammonia-N mg/l	7.93	5.11	1.74	2.69	2.59
Chlorine mg/l	<0.01	<0.01	0.19	0.35	0.13
F. coli #100 ml	12	<1	6	60	80
Fluoride mg/l	8.39	8.81	7.45	6.26	9.23
Nitrate/Nitrite-N mg/l	0.67	2.62	0.76	0.78	0.98
TKN mg/l	9.35	3.11	0.60	1.70	0.03
Oil+Grease mg/l	2	1	1	1	1
Phosphorus mg/l	0.11	<0.01	0.20	0.10	0.17
Sulfide mg/l	0.6	<0.1	0.2	<0.1	<0.1
Aluminum	209	<10	38	8448	<10
Barium	<10	<10	<10	1899	<10
Boron	<10	23	14.2	62	<10
Iron	1043	130	420	1229	906
Molybdenum	125	<10	28	<10	<10
Manganese	120	<10	820	251	154
Antimony	<10	<10	244	<10	<10
Arsenic	11.2	4.0	14.9	3.5	3.3
Beryllium	<2	<2	82	<2	<2
Cadmium	3	<3	6	<3	<3
Copper	4	<5	<5	85	<5
Lead	<10	<10	<10	<10	<10
Nickel	20	<10	61	<10	<10

Table 2. Continued.

PARAMETER	GM 12/14/94	GM 06/21/95	GM 12/13/95	GM 06/12/96	GM 12/12/96	GM 06/23/97
Nickel	2.5	14.4	42.0	45.9	1	1
Selenium	<2	<2	<2	8	<2	<2
Silver	9	<3	<3	9	<3	<3
Thallium	<5	130	<5	<5	<5	<5
Zinc	30	<5	48	9	194	<5
Cyanide, Total	31	<10	<10	<10	40	<10
Total Phenolics	<200	400	300	<200	200	<200
2,3,7,8-TCDD	43	<10	<10	12	28	<10
Acrolein	8.5	10.1	3	22.5	1	<0.5
Bis(2-chloromethyl)ether	11.65	5.34	1.50	6.18	13.18	0.56
Bromoform	20	<2	<2	<2	19	<2
Carbon Tetrachloride	50	60	140	50	60	<2
2-Nitrophenol	<3	4.1	<3	<3	<3	<3
2-Chlorophenol	<5	<5	16	<5	<5	<5
2,4-Dinitrophenol	<5	<5	<5	6	<5	<5
1,2-Dichlorobenzene	<10	<10	<10	130	<10	<10
1,1,2-Trichloroethane	<5	<5	<5	<5	18	<5
Methanol mg/l						
1,4-Dichlorobenzene	<10	<10	<10	26	<10	<10
Fluorene	<10	<10	<10	<10	11	<10
1,3-Dichloropropene	<10	<10	<10	<10	19	<10
Di-n-octyl adipate	<0.1	<0.1	180	90	200	780
3-Methylphenol	<2	490	320	110	<2	620
4,4'-Diphenyl-methane diisocyanate	253	251	264	188	227	144
Propylene	<10	2310	2310	130	170	410

Table 2. Effluent Characterization and Decision Criteria

Summary of analytical results for GM/Defiance outfall 002. All values are in μg/l unless otherwise indicated. PT = data from, pretreatment program reports; 2C = Data from application form 2C; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed.

PARAMETER	GM 12/14/94	GM 06/21/95	GM 12/13/95	GM 06/12/96	GM 12/12/96	GM 06/23/97
COD mg/l	42	38	51	40	40	38
TSS mg/l	6	28	14	6	6	12
Ammonia-N mg/l	11.76	3.6	10.81	6.5	9.21	2.95
Chlorine mg/l	<0.01	0.15	<0.01	0.17	0.12	0.15
F. coli #100 ml	<1	<1	63	800	700	15900
Fluoride mg/l	19.66	26.69	15.26	11.43	13.07	14.78
Nitrate/Nitrite-N mg/l	9.36	7.89	12.32	1.33	<0.001	2.35
TKN mg/l	4.72	1.49	8.28	2.7	3.15	1.14
Oil+Grease mg/l	1	4	4	2	1	1
Phosphorus mg/l	0.32	3.07	0.42	0.26	0.26	0.12
Sulfide mg/l	0.4	<0.1	<0.1	<0.1	<0.1	<0.1
Aluminum	<10	1561	14	<10	853	<10
Barium	<10	<10	<10	1348	1712	<10
Boron	<10	49	19	5.	7	<10
Iron	443	1449	<10	282	811	722
Molybdenum	<10	NA	43	125	476	<10
Manganese	128	261	211	422	235	320
Antimony	137	<10	81	<10	<10	<10
Arsenic	8.6	8.6	11.2	7.4	1.7	40.2
Cadmium	125	637	<10	96	<10	<10
Chromium	725	2738	320	432	392	529
Copper	<10	<10	<10	<10	<10	<10
Lead	<10	<10	<10	<10	<10	<10
Mercury	<0.01	<0.01	<0.01	0.2	<0.01	<0.01

Table 1. Continued.

PARAMETER	Ohio EPA 10/24/95	Ohio EPA 12/12/95	GM 12/15/94	GM 06/21/95	GM 12/18/95	GM 06/12/96	GM 12/11/96	GM 06/24/97	DECISION CRITERIA PEQ_{avg}	DECISION CRITERIA PEQ_{max}
Dichlorodifluoromethane	<0.5	<0.5	<3	<3	<3	8	<3	<3	11	15
Trichloroethylene	<0.5	<0.5	<5	<5	<5	14	<5	<5	19	27
Acetone	ND	3.85*	NA	NA	NA	NA	NA	NA		
Formaldehyde	ND	ND	<0.1	<0.1	180	140	180	970	1487	2037
Naphthalene	<0.5	1.4	<10	<10	<10	<10	<10	<10	3.9	5.3
Pyrene	<2.0	<2.0	<10	<10	<10	18	<10	<10	25	34
Phenol	<2.0	53.5	<25	<25	<25	<25	<25	<25	74	102
2,4-dimethylphenol	<10.1	51.3	<25	<25	49	<25	<25	<25	71	97
Di-n-butyl-phthalate	<5.0	<5.0	16	<10	<10	<10	<10	<10	22	30
Bis(2-ethylhexyl)phthalate	<10.1	<10.1	28	<10	<10	<10	<10	<10	39	53

Table 1. Continued.

PARAMETER	Ohio EPA 10/24/95	Ohio EPA 12/12/95	GM 12/15/94	GM 06/21/95	GM 12/18/95	GM 06/12/96	GM 12/11/96	GM 06/24/97	DECISION CRITERIA PEQ_{avg}	DECISION CRITERIA PEQ_{max}
Iron	81	<50	45	<10	<10	54	196	96	300	412
Molybdenum	NA	NA	125	476	<10	51	<10	<10	730	1000
Manganese	NA	NA	422	235	320	136	148	124	647	886
Tin	NA	NA	<10	<10	<10	200	<10	<10		
Arsenic	NA	NA	7.4	1.7	40.2	216.5	1	<0.5	62	84
Beryllium	NA	NA	<2	<2	<2	21	<2	<2	32	44
Cadmium	<0.2	<0.2	5	<3	<3	6	<3	<3	5.7	75
Copper	<10	<10	7	<5	<5	<5	<5	56	112	153
Lead	<2	<2	<10	<10	<10	<10	<10	<10	69	103
Mercury	NA	NA	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.11	0.15
Nickel	<40	<40	10	<10	<10	19	111	<10	154	211
Selenium	<10	<4	12.3	4	26	169	<0.5	<0.5	83	87
Zinc	207	367	437	62	278	225	380	42	315	452
Cyanide, Free	6	5	NA	NA	NA	NA	NA	NA	13	20
Cyanide, Total	NA	NA	80	<2	<2	15	12	<2		
Phenolics (4AAP)	12	204	<2	<2	80	50	285	<2	45	67
Benzene	<0.5	0.9	<5	<5	<5	<5	<5	<5	1.25	1.7

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,2]	c	d	e	f	g	h	i[2]	j	k	l[1]
µg/l	Magnesium, Dissolved			X									
mg/l	Total Dissolved Solids			X									
mg/l	Total Organic Carbon			X									
µg/l	Barium, Total			X									
mg/l	Cyanide, Total			X									
µg/l	Mercury, Total			X									
µg/l	Selenium, Total			X									
µg/l	Silver, Total			X									
µg/l	Pentachlorophenol				X								
µg/l	Nickel, Total							X			X		
µg/l	Zinc, Total							X			X		
#/100ml	Fecal Coliform											X	

* Time between the storm event when sampling is being conducted and the last storm event producing rainfall greater than 0.1 inches.

(1) and any pollutant limited in an effluent guideline or categorical pretreatment standard which the facility is subject.

(2) and the primary ingredient used in the deicing materials used at the site (e.g., ethylene glycol, urea, etc.).

(3) Facilities that are classified as SIC 33 only because they manufacture pure silicon and/or semiconductor grade silicon are not required to monitor for this parameter.

2. Industrial Activity Categories Definitions

a. Section 313 of SARA Title III Facilities. As of the effective date of this permit, facilities with storm water discharges associated with industrial activity that are subject to requirements to report releases into the environment under Section 313 of SARA Title III for chemicals which are classified as 'Section 313 water priority chemicals' are not (as they may have been in a previous permit) required to monitor storm water that is discharged from the facility unless required by paragraphs V.B.2.b through B.2.l.

b. Primary Metal Industries. Facilities with storm water discharges associated with industrial activity classified as Standard Industrial Classification (SIC) 33 (Primary Metal Industry) are required to monitor such storm water that is discharged from the facility.

c. Land Disposal Units/Incinerators/BIFs. Facilities with storm water discharges associated with industrial activity from any active or inactive landfill, land application sites or open dump without a stabilized final cover that has received any industrial wastes from a facility with a Standard Industrial Classification (SIC) of between 20-39 (manufacturing); and incinerators (including Boilers and Industrial Furnaces (BIFs)) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to monitor such storm water that is discharged from the facility.

d. Wood Treatment Using Chlorophenolic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

e. Wood Treatment Using Creosote Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

B. (continued)

f. Wood Treatment Using Chromium-Arsenic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

g. Coal Pile Runoff. Facilities with storm water discharges associated with industrial activity from coal pile runoff are required to monitor such storm water that is discharged from the facility.

h. Battery Reclaimers. Facilities with storm water discharges associated with industrial activity from areas used for storage of lead acid batteries, reclamation products, or waste products, and areas used for lead acid battery reclamation (including material handling activities) at facilities that reclaim lead acid batteries are required to monitor such storm water that is discharged from the facility.

i. Airports. At airports with over 50,000 flight operations per year, facilities with storm water discharges associated with industrial activity from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to monitor such storm water that is discharged from the facility.

j. Coal-fired Steam Electric Facilities. Facilities with storm water discharges associated with industrial activity from coal handling sites at coal fired steam electric power generating facilities (other than discharges in whole or in part from coal piles subject to storm water effluent guidelines at 40 CFR 423 - which are not eligible for coverage under this permit) are required to monitor such storm water that is discharged from the facility.

k. Animal Handling / Meat Packing. Facilities with storm water discharges associated with industrial activity from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to monitor such storm water that is discharged from the facility.

l. Additional Facilities. Facilities with storm water discharges associated with industrial activity that:

(1) come in contact with storage piles for solid chemicals used as raw materials that are exposed to precipitation at facilities classified as SIC 30 (Rubber and Miscellaneous Plastics Products) or SIC 28 (Chemicals and Allied Products);

(2) are from those areas at automobile junkyards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) are exposed to storm water; (B) over 500 auto/truck units (bodies with or withou drivelines in whole or in parts) are stored exposed to storm water; or (C) over 100 units per year are dismantled and drainage or storage of automotive fluids occurs in areas exposed to storm water;

(3) come into contact with lime storage piles that are exposed to storm water at lime manufacturing facilities;

(4) are from oil handling sites at oil fired steam electric power generating facilities;

(5) are from cement manufacturing facilities and cement kilns (other than discharges in whole or in part from material storage piles subject to storm water effluent guidelines at 40 CFR 411 - which are not eligible for coverage under this permit);

(6) are from ready-mixed concrete facilities; or

(7) are from ship building and repairing facilities;

are required to monitor such storm water discharged from the facility.

B. (continued)

3. Sample Type. Take a minimum of one grab sample from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

4. Sampling Waiver. When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of features and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g. low (under 40%), medium (40% to 65%) or high (above 65%)) shall be provided.

C. **Toxicity Testing.** Not Required.

D. **Alternative Certification of "Not Present or No Exposure."** You are not subject to the analytical monitoring requirement of this part provided: you make a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring required under this part, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period; and your certification is signed in accordance with Attachment VI.G and retained in the SWP3. If you cannot certify for an entire period, you must note the date exposure was eliminated and perform any monitoring required up until that date.

Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION

A. Failure to Certify. Any facility that is unable to provide the certification required under paragraph IV.D.3.g.(1) (testing for non-storm water discharges), must notify the Director within 180 days of the effective date of this permit. Such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible.

B. Signatory Requirements. See Part III.28.

C. Definitions.

"Section 313 water priority chemical" means a chemical or chemical categories which are: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986; 2) are present at or above threshold levels at a facility subject to SARA Title III, Section 313 reporting requirements; and 3) that meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to section 311(b)(2)(A) of the Act at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Definition of Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 373;

C. (continued)

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but not limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity - This category of industrial activity is not regulated under this permit.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

"SWPPP" means storm water pollution prevention plan to be completed as a condition of this permit (see Part IV of this permit).

"Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

"Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

"10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in "Weather Bureau Technical Paper No. 40,", May 1961 and "NOAA Atlas 2," 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

COMBINED ADJUSTED STANDARDS FOR PROCESS WASTEWATER DISCHARGE AT GMPT DEFIANCE

Maximum (lbs. per day)

	Parameters					
Operation	**Copper**	**Lead**	**Zinc**	**Phenolics**	**O&G**	**TSS**
Fe clean	0.112746	0.207138	0.381938	0	11.7116	14.858
Fe dust	13.761957	25.12504	46.58864	40.78084428	1420.385443	1799.154894
Fe melt	1.5309792	2.791786	5.163302	4.5178896	157.6008	199.62768
Fe slag quench	0.460598	0.842536	1.55572	0	47.7204	60.3934
TOTALS	15.86628	28.9665	53.6896	45.29873388	1637.418243	2074.033974
Conc. Limits* (mg/L)	0.9512158	1.736601	3.218801	2.715751431	98.16656133	124.3425644

*based on average flow from facility = 2 MGD

Average (lbs. per day)

	Parameters					
Operation	**Copper**	**Lead**	**Zinc**	**Phenolics**	**O&G**	**TSS**
Fe clean	0.062054	0.101384	0.14421	0	3.89804	5.8558
Fe dust	7.575389	12.31001	17.54965	14.20385443	474.0930968	713.3491336
Fe melt	0.8420386	1.367375	1.951248	1.576008	52.5336	78.950496
Fe slag quench	0.254334	0.413402	0.588202	0	15.9068	23.8602
TOTALS	8.7338156	14.19217	20.23331	15.77986243	546.4315368	822.0156296
Conc. Limits* (mg/L)	0.52361	0.850849	1.213028	0.946034918	32.75968446	49.28151257

*based on average flow from facility = 2 MGD

26-Sep-97

PRODUCTION-BASED LIMITATIONS CALCULATIONS FOR IRON
DEFIANCE FOUNDRY
Best Practicable Control/Best Available Control Technology

Adjusted Standard = Listed Standard x Rate

CASTING CLEANING:

	Maximum (lbs.)			Average (lbs.)		
Parameter	Standard	Rate*	Adj. Std.	Standard	Rate*	Adj. Std.
Copper	0.0129	8.74	0.112746	0.0071	8.74	0.062054
Lead	0.0237	8.74	0.207138	0.0116	8.74	0.101384
Zinc	0.0437	8.74	0.381938	0.0165	8.74	0.14421
Oil and Grease	1.34	8.74	11.7116	0.446	8.74	3.89804
TSS	1.7	8.74	14.858	0.67	8.74	5.8558

*Pounds of metal poured (in millions)

DUST COLLECTION SCRUBBER:

	Maximum (lbs.)			Average (lbs.)		
Parameter	Standard	Rate*	Adj. Std.	Standard	Rate*	Adj. Std.
Copper	0.218	63.128	13.76196	0.12	63.128	7.575389029
Lead	0.398	63.128	25.12504	0.195	63.128	12.31000717
Zinc	0.738	63.128	46.58864	0.278	63.128	17.54965125
Phenolics	0.646	63.128	40.78084	0.225	63.128	14.20385443
Oil and Grease	22.5	63.128	1420.385	7.51	63.128	474.0930968
TSS	28.5	63.128	1799.155	11.3	63.128	713.3491336

*SCFM processed (in billions)

MELTING FURNACE SCRUBBER:

	Maximum (lbs.)			Average (lbs.)		
Parameter	Standard	Rate*	Adj. Std.	Standard	Rate*	Adj. Std.
Copper	1.02	1.50096	1.530979	0.561	1.50096	0.84203856
Lead	1.86	1.50096	2.791786	0.911	1.50096	1.36737456
Zinc	3.44	1.50096	5.163302	1.3	1.50096	1.951248
Phenolics	3.01	1.50096	4.51789	1.05	1.50096	1.576008
Oil and Grease	105	1.50096	157.6008	35	1.50096	52.5336
TSS	133	1.50096	199.6277	52.6	1.50096	78.950496

*SCFM processed (in billions)

SLAG QUENCH:

	Maximum (lbs.)			Average (lbs.)		
Parameter	Standard	Rate*	Adj. Std.	Standard	Rate*	Adj. Std.
Copper	0.0527	8.74	0.460598	0.0291	8.74	0.254334
Lead	0.0964	8.74	0.842536	0.0473	8.74	0.413402
Zinc	0.178	8.74	1.55572	0.0673	8.74	0.588202
Oil and Grease	5.46	8.74	47.7204	1.82	8.74	15.9068
TSS	6.91	8.74	60.3934	2.73	8.74	23.8602

*Pounds of metal poured (in millions)

26-Sep-97

GENERAL MOTORS CORPORATION
WORKSHEET FOR METAL MOLDING AND CASTING POINT SOURCE CATEGORY
40 CFR 464

FACILITY NAME: GMPTG Defiance Casting Plant
FACILITY LOCATION: Defiance, Ohio

TYPE(S) OF METAL POURED: Grey and Nodular Iron

RATED CAPACITY :

IRON:	5200	tons poured per day

OPERATING CAPACITY:

IRON:	4370	tons poured per day	84.04	Percent

IS A TIERED PERMIT NEEDED (Y/N)? No

DISCHARGE TYPE: Direct to Maumee River.

REGULATED OPERATIONS: Ferrous Casting Subcategory.

IRON	Y/N	Units
Casting Cleaning	Y	Mass Iron Poured
Casting Quench	N	Mass Iron Poured
Dust Collection Scrubber	Y	Billions SCFM
Investment Casting	N	Mass Iron Poured
Melting Furnace Scrubber	Y	Billions SCFM
Mold Cooling	N	Mass Iron Poured
Slag Quench	Y	Mass Iron Poured
Wet Sand Reclamation	N	Mass Sand Poured

26-Sep-97

Attachment 1 - Effluent Guideline Calculations for GM Powertrain Division