M E M O R A N D U M

Engineering Division

To: Greg Armendariz, City Engineer/Public Works Director

From: Kathleen Phalen, Utility Engineer

Subject: Recommendation for Approval of Increased Wastewater Discharge Limits for Headway Technologies, 497 South Hillview Drive

Date: January 8, 2008

Attachments:

(1) Headway Technologies "Request for Increase Water Discharge Volume to Sanitary Sewer," Gary Winslow, Director, Environmental Health and Safety, December 4, 2007

(2) Council Resolution 6840 – Industrial Wastewater Discharge Policy

Headway Technologies is asking the City to increase its permitted wastewater discharge volume from 114,700 gallons per day to 151,000 gallons per day for its 497 South Hillview Drive facility. Utility Engineering has reviewed this request and finds that the City has available capacity and that this request satisfies the City's municipal code requirements and policy; therefore we are recommending that the City grant approval.

Maximum discharge rates for industrial facilities are regulated by Title VIII, Chapter 2, Section 5.06 of the Milpitas Municipal Code. Industrial wastewater discharges are limited to 12,000 gallons per day per acre or 0.8 gallons per day per square foot of building area, unless the City approves a higher limit. The code states that Council may increase this limit on a case-by-case basis after conducting a public hearing to consider the following:

1. Whether the specific use would overload the City's sewer system or the contractually available treatment capacity;
2. Whether the specific use would require an inequitable appropriation of water and sewage capacity compared to present and reasonable anticipated future needs of other users;
3. Whether the specific use would hamper the present and future development of land or facilities because the use preempts capacity required by said development.

Our analysis shows that the City can make positive findings for these considerations.

1. The City's infrastructure is sufficiently sized to accept the increased flow rate. In 2002, Headway shared the cost to increase the size of the public sewer line serving the facility. This upsizing was completed as a condition of a previous request by Headway for additional discharge. However, Headway subsequently withdrew this request for increased limits after executing the cost share agreement.
2. The City can accommodate the increased treatment needs. Because this zoning use remains consistent with the Sewer Master Plan assumptions, it is not technically counted against the City's remaining unallocated capacity. From a practical perspective, it may

be considered a reallocation of the Sewer Master Plan Large Dischargers volume. The 2004 Sewer Master Plan showed that the City's Large Dischargers (defined as industrial dischargers of using over 30,000 gallons of water per day in 2001) contributed 2.2 mgd of wastewater to the City system. The most recent water use data shows that both the number and total volume of large industrial dischargers has decreased to 1.9 mgd or less. Thus, even with Headway's requested increase of 0.036 mgd, the Large Dischargers current use would remain well below the Sewer Master Plan assumptions.

On January 19, 1999, Council adopted the "Policy for Granting Industrial Wastewater Discharges" by Resolution 6840 to further define and guide the City in its consideration of the municipal code requirement (attached). On November 26, 2007, Utility Engineering staff met with Headway Technologies Director of Environmental, Health and Safety Services and Facility Manager to discuss and evaluate their actions to satisfy the City's discharge policy. The Director's request of December 4, 2007 satisfactorily addresses all policy criteria, summarized as follows:

1. *Implement water conservation and use recycled water to the maximum extent feasible,*

   After Headway retracted their request for additional discharge in 2000, they embarked on an aggressive program to implement water conservation and water reuse throughout their processes. They conducted a water audit to optimize water use, and then made substantial investment into new equipment to conserve water usage in their cooling towers, water treatment, manufacturing operations and bathroom fixtures. Headway now recycling their own internal process waters and state that they are willing to evaluate use of the South Bay Water Recycling source water for cooling towers and irrigation.

2. *Reduce wastewater discharge at a prorated rate when called upon by the City to comply with if Milpitas' total discharges capacity rights at the Water Pollution Control Plant*

   Headway states that they will agree to this condition.

3. *Share in costs with other local high users for any needed local sanitary sewer improvements*

   Headway states that they will agree to this condition. It should be noted that on December 29, 1998, Headway agreed to share the cost of upsizing downstream sewer pipes that would have been impacted by their last sewer discharge request, had they not later retracted the request. No further pipe enlargement is needed to accommodate this current request.

4. *Be an industry consistent with the City's economic development strategy*

   Headway Technologies is a high technology integrated circuit manufacturing subsidiary firm of SAE Magnetics of Hong Kong and TDK Corporation of Japan. The Headway Technology subsidiary is headquartered in Milpitas and their 497 South Hillview Drive facility fabricates magneto-resistive heads to read and write data onto hard-disk drives. Their current rate of wafers and head-candidates manufacturing is at the facility's highest capacity. They are planning additional process growth beginning in April 2008 that necessitates additional water use and discharge.

5. *Reduce levels of air pollutants, urban runoff, and noise pollution to the extent feasible*

Headway Technologies has invested in equipment and processes to reduce emissions and discharge of pollutants. They are a permitted industrial discharger participating in the sanitary sewer pretreatment program. Headway Technologies is actively seeking ISO14000 certification for their environmental management. This international certification will demonstrate their actions minimize the impact of their operations affect the environment (cause adverse changes to air, water, or land) and to comply with applicable laws, regulations, and other environmentally oriented requirements.

6. *Contribute $2 per gallon per day (adjusted with ENR) over the municipal code, and enter into agreement with City*

   Headway states that they will agree to this condition.

Headway Technologies
A TDK Group Company

December 4, 2007

Mr. Greg Armendariz
City Engineer
City of Milpitas
455 E. Calaveras
Milpitas, CA 95035

Subject: Request for Increased Water Discharge Volume to Sanitary Sewer (Revised)

Dear Sir,

Headway Technologies, Inc. (Headway) requests the City of Milpitas to grant increased wastewater discharge volume for Headway's operations at 497 S. Hillview Drive. The aforementioned building is Headway's manufacturing facility (Fab) dedicated to an integrated circuit manufacturing process, which creates magneto-resistive heads that "read" and "write" data to a hard-disk drive.

Headway became the sole occupant of its leased manufacturing building in 1998. Headway has paid significant sales and use taxes each year over an extended period of time and currently employs 580 people.

Wafer and head-candidate manufacturing is currently at its highest output level, with additional growth projected into the next fiscal year (beginning April 2008). In order to meet production targets, Headway predicts that it will need to discharge wastewater to the sanitary sewer, in excess of its currently permitted volume (below).

Current Permitted Volume: 114,700 gallons per day

The planned increase in production over the next 18 months is expected to require DI production of up to 113,100 gallons per day, plus associated other discharges (see page 12). As a result, Headway requests that its total wastewater discharge volume be increased, to the amount indicated below.

Requested Permit Volume: 151,000 gallons per day

This letter is submitted to provide information, in accordance with Council Resolution 6840. Your prompt consideration of Headway's request is greatly appreciated. If you need additional information, please contact Headway, as soon as possible.

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Facility Description

Headway produces magneto-resistive thin-film heads for hard disk drives. The manufacturing process is similar to that of a semiconductor. Layers of specially designed integrated circuits are created on the surface of a ceramic wafer using a series of manufacturing steps, including: photolithography, development, strip, wet-chemical plating, wet-chemical etch, rinse(s), metal sputtering, reactive ion etch and several related processes.

Hard disk drives are the main data storage device within personal computers, laptop computers, internet/intranet servers, MP3 players, home video game consoles and DVD recorders worldwide. The "head" serves two functions. First, it must be capable of delivering an electronic signal, thereby transferring data to and storing data upon the storage disk (write-function). In addition, the "head" must be able to sense the magnetic status of extremely small areas of disk surface and accurately relay the exact series of charged regions to the computer's processing unit (read-function).

There are very few head-manufacturing facilities remaining in the world, due to industry consolidation. Headway's manufacturing capability is recognized as one of the leaders of high data density technology and high quality manufactured parts. The Milpitas Fab represents 20% of the worldwide head manufacturing capacity and 40% of the worldwide head manufacturing capacity that is not vertically integrated within a hard-disk-drive manufacturer.

Background

Headway appeared before the Milpitas City Council at a Public Hearing on August 18, 1998. As a result of the Public Hearing, Headway was granted a wastewater discharge volume of 114,700 gallons per day (gpd). At that time, Council assigned City Staff to create a policy to govern future requests for increased sewer discharge capacity. As a result, City Council Resolution 6840 was subsequently approved on January 19, 1999.

In 2000 Headway exchanged correspondence with City Staff ultimately requesting 127,210 gpd of discharge volume. City Staff supported Headway's request, but the City Council refused to grant the requested discharge volume increase at a Public Hearing on December 5, 2000. In a letter dated January 2, 2001, Headway formally rescinded its application for increased wastewater discharge volume and announced that it would initiate an independent evaluation (audit) of its water management practices in order to develop information consistent with the findings required in City Council Resolution 6840.

In accordance with City Council recommendations, Headway has agressively evaluated its water management practices (2001-present) and invested in significant water-savings

technologies. Headway's efforts were recognized by the City of San Jose, resulting in Headway being nominated by the City of San Jose's, Environmental Services Department to be considered for the California Water Environment Association's (CWEA) Pretreatment, Pollution Prevention and Stormwater, Facility of the Year Award for 2003. Headway's nomination was primarily based on its water reduction efforts.

Headway voluntarily participated in the Santa Clara Valley Water District 2004-2005 Water Use Survey Program (report issued June 2005). Therein two (2) projects were recommended specifically related to reducing water usage and related discharge volumes. Headway has since installed the recommended low-flow toilets and faucet aerators. The SCVWD's report was very complimentary of Headway's existing water reduction efforts.

Production plans for the remainder of 2007 and foreseeable 2008 project increased water usage and few if any remaining water reduction measures. As a result, Headway projects that wastewater discharge volumes will increase beyond the currently permitted 114,700 gpd.

Headway is also committed to obtaining ISO14001 Certification for its Environmental Management System (EMS) by the end of its current fiscal year (March 2008). ISO 14001 for environmental management is similar to the more familiar ISO 9000 for quality management. Headway's Environmental Policy requires adherence to all applicable laws and regulations associated with its significant environmental aspects, and therefore, Headway desires to address its wastewater volume needs with the City, at this time.

In accordance with Headway's stated environmental policy and in recognition of Headway's past water reduction efforts, this letter is submitted to request increased wastewater discharge volume, in accordance with the requirements of City Council Resolution 6840 (1999), as discussed below.

Resolution No. 6840 Requirements

Headway understands that: (1) the volume that the San Jose Water Pollution Control Plant (WPCP) may discharge to South San Francisco Bay is limited by an NPDES Permit and (2) the volume that the City of Milpitas may discharge to the WPCP is based on the sewage capacity rights that it has purchased and (3) the above referenced resources may already be utilized close to their capacity.

The Milpitas Municipal Code requires City Council approval for industrial discharges in excess of 12,000 gpd per acre and Council Resolution 6840 provides a framework for such applications to be considered by City Staff and the City Council. On that basis, Headway requests that the information provided herein be considered in accordance with that framework.

1. Water Conservation and Recycling

Water Conservation

Facilities Equipment

Cooling Water Towers

VRTX © Equipped

Headway investigated and installed a chemical-free water treatment system to effectively remove calcium from cooling water tower basin water. This innovative technology increases the heat transfer efficiency of the associated chiller by preventing scale build-up and also reduces the volume of blow-down (sewer discharge volume) that is required. Headway has equipped four (4) of its cooling water towers with this equipment. The City of San Jose provided a water savings rebate to Headway for two (2) of these installations (retrofits only, not new construction). Calculated water savings are listed below:

South Pad CWT (350 ton) =	3,875 gpd[1]
West Pad CWT (2x400 ton) =	15,200 gpd[2]
North Pad CWT #2 (800 ton) =	7,600 gpd[3]
North Pad CWT #3 (800 ton) =	7,600 gpd[4]

Chemical Treated

Headway continues to operate its two remaining CWTs using chemical-additives to prevent scaling. Nevertheless, Headway has experimented with increasing the Cycles of Concentration (CoC) for one of the chemically-treated cooling water towers. Headway is currently operating this CWT at approximately 4-5 CoC and has done so for an extended period of time. Estimated water savings resulting from operating at increased CoC is below.

North Pad CWT (500 ton)(chemical) = 4,769 gpd

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[1] Reported Water Reduction Volume Confirmed by City of San Jose Staff (2004)
[2] Reported Water Reduction Volume Confirmed by City of San Jose Staff (2003)
[3] Reported Water Reduction Volume Based (half) on City of SJ's Findings for Same-Size CWT, above.
[4] Reported Water Reduction Volume Based (half) on City of SJ's Findings for Same-Size CWT, above.

High Efficiency Reverse Osmosis

Cost efficient integrated circuit manufacturing necessitates that deionized (DI) water be manufactured on-site. Reverse osmosis (RO) is the preferred manufacturing process. Typical dual-pass RO "rejects" or otherwise discharges to sanitary sewer approximately 25% of the total city water processed (75% production efficiency). Headway investigated and invested in a patented "high-efficiency reverse osmosis" (HERO©) system to manufacture DI water. This system came on-line in 2004. As a result of the investment in this technology, Headway discharges less than 15% of the city water processed by the RO. The City of San Jose provided a water savings rebate to Headway in 2004. Estimated water savings resulting from the HERO© system (in 2004) is below.

HERO© RO Reject Reduction = 8,655 gpd[5]

Process Cooling Water Systems

Headway uses a variety of closed-loop process cooling water systems to provide direct cooling to various types of process equipment. This water is a blend of City water and DI, where DI is added to maintain a specified level of resistivity. Water is not "consumed" or "discharged" during routine processing. However, when DI is added to the fixed volume of the system, an equivalent volume must be "discharged". As a result, the volume of DI additions to control resistivity drives the volume discharged to the sewer. Headway noted that one of its process cooling water (closed-loop) systems used significantly more DI water than its other process cooling water systems. As a result, an in-line treatment system (ion-exchange - IX) was installed to remove ionic contamination that was affecting resistivity. As a result of the installation of the IX treatment on the process cooling water loop and reservoir, DI water addition and resulting discharge dropped substantially. Estimated water savings resulting from the IX treatment of the process cooling water system is below.

IX on Cooling Water System = 3,000 gpd

[5] Reported Water Reduction Volume Confirmed by City of San Jose Staff (June 2004)

Toilets and Sinks

Headway voluntarily participated in the Santa Clara Valley Water District (SCVWD) 2004/2005 Water Use Survey Program. A report was submitted to Headway identifying two (2) specific recommendations to reduce wastewater discharge. Those recommendations were to install additional low-flow toilets and low-flow faucet aerators in some older restrooms and break rooms that had not recently been up-dated to current water efficiency standards. Headway installed the requested toilets and aerators. The SCVWD's estimated water savings are reported below.

Low Flow Toilets (6) =	856 gpd
Low Flow Aerators (12) =	51 gpd

Water Management (Water Model)

In accordance with Headway's commitment to the city to conduct an "audit" of its water management practices, a project was undertaken to create a piping and instrument diagram (P&ID) of the city-water distribution system within the facility (2001). All distribution piping, valves, fittings and meters were researched and organized using computer-aided design (CAD) software. In addition to documenting how water was directed within the facility, spreadsheets were created to calculate the volume of water that flowed from point-to-point. Each installed water meter was read on a daily basis and the meter readings were entered into associated spreadsheet(s).

The P&ID was used to "calculate" or "estimate" flows, which were not specifically measured by an installed water meter. A simplified schematic drawing showing the location of all water meters was also created. Algorithms were created to approximate the flow of water to every major water-using piece of equipment at the facility. Total water purchased could be read from incoming city water meters. Total evaporative loss was then calculated by adding the individual evaporative losses from each cooling water tower (CWT) and boiler. Thereafter, the volume of total water discharged to sewer was calculated by subtracting total evaporative loss from total water purchased.

Over time, additional water meters have been added to selected water pathways to improve the direct measurement of water usage and flow. In 2006-2007 all water meters within the facility were converted to digital meters and system software was added to automatically read the meters, record the data and subsequently enter each meter's daily usage into a master database. Control limits have been added recently to identify abnormal usage and alert facility personnel to such anomalies. Headway maintains that its water management system exceeds any legal requirement or typical industry model and is a reliable management tool to track water use and verify that water using equipment is functioning as designed. Portions of the water model are routinely provided to governmental agencies as part of Permit Applications, Discharge Reports, Rebate Applications and responses to related inquiries.

Manufacturing Process Equipment

Lower Water Use Electroplating Equipment

Over the past 6 years, Headway has transitioned the majority of its wet-electroplating process steps to relatively lower-water-use equipment. Historically, electroplating process steps were conducted on a wet-bench using a quick-dump-rinse (QDR) step. The QDR uses a series of three overflowing cascade rinses, discharging approximately 11 liters per rinse for a total of approximately 33 liters per process step. New proprietary automated plating equipment has been installed, which does not use a QDR. Post process rinsing is now conducted by a series of restricted flow spray nozzles. Rinse volume is estimated to be less than 3.3 liters. Although some of the older-type of electroplating equipment are still in use within the manufacturing area, the majority of electroplating process steps are performed on the newer automated tools. On that basis, the new process equipment has significantly reduced the volume of wastewater discharged to sewer. Estimated water savings resulting from the transition to the new automated electroplating systems is below.

Automated Electroplating Equipment = 2,067 gpd

Water Free Solvent Cleaning Process - LIO

Over the past two (2) years, Headway has transitioned a portion of its wet-solvent cleaning (strip) process steps to a water-free solvent cleaning process. Historically, strip process steps were conducted on a wet-bench using a quick-dump-rinse (QDR), as described above. The new automated strip tool does not use a QDR. In the new tool, there is no post process water rinse. The final cleaning is conducted using a solvent vapor drier (isopropanol=IPA). In addition, since the wafer is clean and dry as a result of the IPA drying step, another water-using process (SRD) is no longer needed. Although several of the old-type of strip process equipment are still in use within the manufacturing area, the new solvent cleaner with the vapor drier reduces the volume of water discharged from each process step that it performs. On that basis, the new process equipment has reduced the volume of wastewater discharged to sewer. Estimated water savings resulting from the introduction of the new vapor drier system is below.

Solvent Cleaner with Vapor Drier = 2,526 gpd (No QDR)
Solvent Cleaner with Vapor Drier = 114 gpd (No SRD)

Water Free Solvent Cleaning Process - EQX

Over the past two (2) years, Headway has transitioned a portion of its wet-solvent cleaning (strip) process steps to a water-free solvent cleaning process. Historically, strip process steps were conducted on a wet-bench using a quick-dump-rinse (QDR), as described above. The new single-chambered strip tool does not use a QDR. In the new tool, there is no post process water rinse. The final cleaning and drying is conducted using nitrogen. In addition, since the wafer is clean and dry as a result of the nitrogen drying step, another water-using process (SRD) is no longer needed. Although several of the old-type of strip process equipment are still in use within the manufacturing area, the new single-chambered solvent cleaner with the nitrogen drier reduces the volume of water discharged from each process step that it performs. On that basis, the new process equipment has reduced the volume of wastewater discharged to sewer. Estimated water savings resulting from the introduction of the new single-chambered solvent cleaner is below.

Solvent Cleaner with Vapor Drier = 4,120 gpd (No QDR)
Solvent Cleaner with Vapor Drier = 187 gpd (No SRD)

Transition to Higher Density Wafers

In 2000 and again in 2006-2007, Headway undertook projects to significantly increase the density of its "heads" on the surface of the wafer it produced. Although Headway produces and sells a completed "wafer", the effort to create each wafer is actually based on the number of discrete manufacturing steps required to make it (moves). If manufacturing "moves" remain constant and the number of heads on the wafer was to double, then the same number of heads could be manufactured by creating half as many wafers. As a result, DI and even total water use would be expected to decrease by some factor. Please note that the total water used and discharged from the facility would not decrease at the same rate as DI volume or the number of wafers produced, for two primary reasons. First, some water use is associated with the operation of facilities equipment (CWTs, for example) and does not vary with production volume. Second, the number of manufacturing process steps continues to increase with successive wafer designs and product densities. On that basis, water usage and wafer output may not track linearly when normalized together. Nevertheless, higher density wafers reduce water usage, as long as the increase in process steps is less than the relative increase in density. No specific water discharge volume is calculated for this transition.

Water Recycling

Gray Water Generated by Headway

Facilities Equipment Gray Water

Headway generates and discharges industrial (gray) water from a variety of Facilities process equipment, including several discussed above (reverse osmosis (RO) reject water, cooling water tower blowdown (VRTX-equipped), cooling water tower blowdown (chemically-treated), process cooling water blowdown, boiler blowdown, post-metals treatment wastewater, post acid/base treatment wastewater, etc).

Each of the aforementioned gray waters have been evaluated as a possible influent feed into other Facilities water using equipment (without pre-treatment). For example, Headway evaluated using RO reject water as influent water for a cooling water tower. Similarly, process cooling water blowdown was also evaluated as an influent water to a cooling water tower.

Upon further investigation, it was determined that such reuse adds some instability to the operation of the receiving system, resulting in increased operational complexities and requiring increased management.

In order for RO reject and process cooling water blowdown to be "reused" (as an example), it would be beneficial to generate relatively high volumes of such gray water(s) and thereby manage such gray water(s) to have relatively low concentrations of impurities. In this way, the gray water would closer resemble "city water" quality and cause relatively fewer changes to the operation of the receiving equipment.

Headway believed that continuing to generate high volumes of relatively clean gray water to promote recycling was not fully consistent with its philosophy of reducing water purchased, in addition to establishing strict control of Facilities equipment and operations. Instead, Headway installed equipment to significantly reduce water purchases and reduce associated gray water generation at individual systems.

For example, instead of plumbing RO reject water for use in cooling water towers, Headway installed a high-efficiency reverse osmosis system to reduce the amount of water purchased and the amount of water rejected in order to make the necessary volume of deionized water. This seemed a more direct and practical approach to reducing wastewater discharge volume(s).

A second example is related to process cooling water blowdown. Rather than collect the blowdown, store it and pump it to equipment that may have been able to reuse it, Headway installed an ion-exchange (IX) treatment system on the recirculation loop to remove the impurities that were necessitating high volumes of blowdown. The IX treatment significantly reduced the volume of blowdown and eliminated the purchase of that volume of city water.

As discussed above, Headway's approach to water conservation (reducing water purchased, used and discharged) has reduced gray water volumes to the point that the relative concentration of impurities (in RO reject for example) makes the gray water much less attractive for reuse or recycling.

Manufacturing Gray Water

Headway's manufacturing processes typically use deionized water for a variety of purposes, including electroplating, wet-chemical etch, chemical-mechanical polish, developer processing and related rinses. In most cases, the process equipment does not provide for the very cleanest rinse waters to be separated within the process tool. On that basis, Headway is not able to separate and segregate relatively clean rinse waters from relatively contaminated process wastewater.

There are some manufacturing rinse processes that generate relatively clean gray water. Unfortunately, there is no dedicated drain pipe extending throughout Headway's fab to receive and segregate such relatively clean rinse waters from other process wastewaters. As a result, all such wastewaters are commingled in common drains and subsequently treated prior to discharge. Headway evaluated a scope of work necessary to separate contaminated process waste waters into one drain and segregate relatively clean rinse waters into a separate drain, but decided to continue on its path to reduce water usage and discharge, as described previously.

South Bay Recycled Water (purple pipe)

Feed for Cooling Water Towers

Headway coordinated connection points for South Bay Recycled Water (purple pipe water) to be connected to landscaping and other unused city water metered connections at Headway's manufacturing facility. Such connections have not been completed by the city, to date. City staff and Headway are researching the procedures for cross-connection prevention testing.

Assuming that the cross-connection testing methods can be coordinated, Headway agrees to conduct a test of South Bay Recycled Water in one (or more) cooling water towers at its facility. City of San Jose staff report that purple pipe water has been successfully reused as an influent into cooling water towers within their jurisdiction. Headway agrees to allow City of San Jose consultants and staff to participate in and witness such testing at Headway's facility after the recycled water connections are completed.

Potential Increase to Discharge Volume

Headway is very concerned that the introduction of internally generated gray water or externally provided recycled water into Headway's Facilities equipment (cooling water towers, for example) will require blow down set-points to be modified resulting in an increased blow down volume being discharged to sewer (in order to successfully substitute gray/recycled water for city water). Any such increase in blow down or other associated discharge to allow the successful introduction of gray/recycled water is not included in Headway's requested waste water discharge volume, as discussed in this letter.

Total Water Reduction Measures Summary (to date)

As indicted above, Headway has transitioned from its historical water-use equipment to more water-efficient equipment in both its facilities support and manufacturing areas. Based on the calculated water reductions discussed above, Headway has avoided purchasing and discharging the water volume totaled below.

South Pad CWT (350 ton) =	3,875 gpd
West Pad CWT (2x400 ton) =	15,200 gpd
North Pad CWT #2 (800 ton) =	7,600 gpd
North Pad CWT #3 (800 ton) =	7,600 gpd
North Pad CWT (500 ton)(chemical) =	4,769 gpd
HERO RO Reject Reduction =	8,655 gpd
IX on Cooling Water System =	3,000 gpd
Low Flow Toilets (6) =	856 gpd
Low Flow Aerators (12) =	51 gpd
Automated Electroplating Equipment =	2,067 gpd
Solvent Cleaner with Vapor Drier (LIO) =	2,526 gpd (No QDR)
Solvent Cleaner with Vapor Drier (LIO) =	114 gpd (No SRD)
Solvent Cleaner with Vapor Drier (EQX) =	4,120 gpd (No QDR)
Solvent Cleaner with Vapor Drier (EQX) =	187 gpd (No SRD)
Total Water Savings:	60,620 gpd

Total Investment Related to Water Reduction Measures (to date)

As indicted above, Headway has audited it own water use systems and transitioned from its historical water-use equipment to more water-efficient equipment in both its facilities support and manufacturing areas. The investment for such activities is summarized below. Please note that the expenditures below do not include the time and effort that regular full-time Headway staff spent on these projects.

HDR Water Audit (2001)	$ 5,000
VRTX for South Pad CWT (350 ton) =	$ 73,333
VRTX for West Pad CWT (2x400 ton) =	$ 97,062
VRTX for North Pad CWT #2 (800 ton) =	$ 82,221
VRTX for North Pad CWT #3 (800 ton) =	$ 82,221
HERO for RO Reject Reduction =	$ 233,735
IX on Cooling Water System =	$ 2,840
Low Flow Toilets (6) =	$ 2,100
Low Flow Aerators (12) =	$ 30
Total Investment	$ 578,542

The above projects were undertaken specifically to investigate water use and reduce water purchases and related discharge volumes. The projects below were undertaken to improve Headway's manufacturing capacity and capability, but included some aspect of water reduction as part of the overall project. The following list represents a capital investment of over $14M.

Automated Electroplating Tools (8)
Solvent Cleaner (1) with Vapor Drier (LIO)
Solvent Cleaners (2) with Nitrogen Drying

Each of the water savings techniques listed above are on-going water savings methodologies. Many of the amounts listed were calculated during non-peak periods. As a result, in many cases, the actual amount of water currently being saved at 2007 peak manufacturing may actually be greater.

Hopefully, Headway's investigation into its own water management methods and the adoption of the water reduction technologies discussed in this section provides the necessary justification for City Staff to support Headway's request for increased discharge volume.

2. Agreement to Reduce Wastewater on Pro-Rata Basis

Headway agrees to reduce wastewater generation at a pro-rata rate if the Milpitas allocated capacity at the Water Pollution Control Plant is exceeded.

3. Agreement to Share Costs of Local Improvements

Headway agrees to share, on a pro-rata basis, any local area improvements to the sanitary sewer with other local area high dischargers, if necessary to achieve wastewater carrying capacity. Headway has already entered into and fulfilled such a cost sharing agreement.

4. Alliance with City Economic Development Strategy

Headway believes that its on-going operation should be viewed as consistent with the city's economic development strategy. High technology corporations have been the economic engine for the growth and development of high living standards throughout Silicon Valley, including the City of Milpitas, for many years.

a) Tax Revenue

Headway's Vice President of Finance reports that Headway has paid significant sales and use taxes to the State of California over an extended period of time. The tax payment reported below is for the fiscal year ended March 30, 2007 and is representative of previous years. Headway understands that approximately 12% of that money is designated to the City. On that basis, Headway believes that its operations and sales generate significant revenue for the City of Milpitas.

Fiscal Year	Sales-Use Taxes Paid	Est City Revenue (12%)
2006-2007	$3.8 Mil	$450k

b) Corporate Headquarters

Headway Technologies, Inc. is a wholly owned subsidiary of SAE Magnetics (H.K.) and TDK Corporation (Japan). Headway has always maintained its corporate headquarters within the City of Milpitas.

c) Expansion of a Licensed Business

The facility requesting the increased wastewater discharge volume is Headway's primary manufacturing facility (Fab). As a result of research and development conducted within Headway's Fab, TDK and Headway made a significant investment to create a new business, also located in the City of Milpitas. The newly created corporate entity is Magic Technologies Inc. (Magic). Without Headway's Fab and engineering capabilities (manpower), the Magic facility would not likely have been built in the City of Milpitas or even within the United States.

d) Research and Development

Headway supports a significant research and development (R&D) effort. Such R&D efforts are primarily focused on the development of the heads that read and write data to a hard disk drive. Headway holds (currently) 273 patents on various technologies.

In addition, Headway researchers have studied other technologies, including fiber optic transmissions and the design and manufacture of random access memory (spun off to Magic). R&D efforts are focused and refocused on varying technologies.

5. Other Emissions and WPCP Discharges

Over the past few years, Headway has invested in various technologies to reduce its emissions to atmosphere or to sanitary sewer, as discussed below.

Headway installed and permitted a thermal oxidation abatement device to minimize emissions of volatile organics (solvents) to atmosphere (2000).

Headway installed and permitted a back-up carbon adsorption abatement device to use during thermal oxidizer preventative maintenance events (2006).

Headway installed and permitted a point-of-use abatement system (gas reactor column) to abate reactive and flammable constituents from a new aluminum (Al) chemical vapor deposition (CVD) system (2001).

Headway installed and permitted three (3) point-of-use abatement systems (oxidation and/or water scrubbers) to abate toxic constituents from being emitted to atmosphere from new reactive ion etch (RIE) process equipment (2004, 2006 and 2007).

Headway installed and permitted a new wastewater treatment system using ion-exchange and nano-filtration technologies to treat metal-bearing wastewater prior to discharge to sanitary sewer (2007).

6. **Contribution to City's Recycled Water Fund**

Headway agrees to contribute to the city's recycled water fund (currently $2/gpd).

Basis for Requested Increase

The table below summarizes Headway's request for increased wastewater discharge volume.

Comparison of 1998 Estimated Water Use and Milpitas Approval and 2007 Request for Increased Discharge Volume				
Year	Total Discharge (gpd)	DI Production (gpd)	RO Reject (gpd) (Reject %)	Other Discharge (gpd) (Tons CWTs)
1998	114,700	75,000	25,000 (25%)	14,700 (1900 tons)
2007	151,000	113,100	16,800 (12.9%)	21,100 (3500 tons)

As discussed previously, Headway projects that it needs to manufacture up to 113,100 gallons of DI product each day. The volume of DI water needed would be much larger, had Headway not installed water-efficient equipment and processes, as described previously. For example, the volume of RO reject needed to support increased DI production has actually decreased, based on the installation of the HERO© system. RO reject volume is now based on a lower (average) reject rate of 12.9%, compared to the original reject rate of 25%.

Headway also projects that it needs increased "Other Discharge", as indicated above. "Other Discharge" is a composite of several smaller discharges, including CWT blow-down, boiler blow-down, process cooling water blow-down and sanitary waste (etc). The projected volume is a 43.5% increase over the 1998 amount, but should be compared to an 84% increase in CWT capacity and significant increases in total square footage of cleanroom space and total heat load of installed manufacturing equipment. In addition, Headway installed new process cooling water systems and boilers and has increased employee headcount.

City Council Approval

Headway understands that this request for increased wastewater discharge volume will need to be submitted to and approved by the City Council. Headway looks forward to working with City Staff to obtain support for such a public review process. Your guidance is greatly appreciated to present Headway's case to the City Council in a way that will likely assure success.

Agreement with City

City Council Resolution 6840 requires that Headway work with the City Attorney to negotiate an agreement related to approval under this resolution. Headway was not previously required to enter into any such agreement in 1998. On that basis, Headway requests that a draft agreement be forwarded to us as soon as possible, so that we may review it in a timely manner.

Summary

Headway Technologies, Inc. (Headway) requests the City of Milpitas to grant increased wastewater discharge volume for Headway's operations at 497 S. Hillview Drive. The aforementioned building is Headway's manufacturing facility (Fab) dedicated to an integrated circuit manufacturing process.

Current Permitted Volume:	114,700 gallons per day
Requested Permit Volume:	151,000 gallons per day

Information has been presented to meet the letter and spirit of Milpitas City Council Resolution 6840. Headway believes that its past water reduction efforts deserve recognition as meeting the city's requirements.

Thank-you for reviewing Headway's request. Headway looks forward to working with City staff to obtain your support for this request prior to review by the City Council. If additional information is needed related to this matter, please contact me at (408) 934-5683.

Sincerely,
HEADWAY TECHNOLOGIES INC.

Gary Winslow, Director
Environmental, Health and Safety

Cc: Kathleen Phalen, City of Milpitas, Principal Civil Engineer
Marilyn Nickel, City of Milpitas, Associate Civil Engineer
David Wagner, Headway Technologies, Vice President of Operations
Dan Burris, Headway Technologies, Facilities Manager
Kevin Haroff, Sonnenschein, Nath and Resenthal

RESOLUTION NO. 6840

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILPITAS
ACCEPTING AN INDUSTRIAL WASTEWATER DISCHARGE POLICY

WHEREAS, Milpitas has purchased sewage capacity rights of 12.5 million gallons per day (mgd) at the regional water pollution control plant (WPCP); and

WHEREAS, Milpitas wastewater volumes being treated at the WPCP are nearing capacity limits; and

WHEREAS, the WPCP's NPDES permit limits overall discharge to 120 mgd; and

WHEREAS, the WPCP's 1998 summer discharge reached 118 mgd; and

WHEREAS, Milpitas Municipal Code Title VIII, Chapter 2, Section 5.06 requires City Council approval of certain industrial discharges; and

WHEREAS, on August 18, 1998, Council recognized that review and approval of future industrial discharges is necessary to insure appropriate use of this dwindling resource and directed staff to develop a policy; and

WHEREAS, an Industrial Wastewater Discharge Policy, attached hereto as Exhibit A and incorporated by reference herein, with criteria for review and approval of future industrial discharges has been developed.

NOW, THEREFORE BE IT RESOLVED by the City Council of the City of Milpitas as follows:
The City Council accepts the Industrial Discharge Policy for use when considering future requests for permitting industrial discharge.

PASSED AND ADOPTED this 19th day of January, 1999, by the following vote:

AYES:	(5)	Mayor Manayan and Councilmembers Lawson, Dixon, Esteves and Livengood
NOES:	(0)	None
ABSENT:	(0)	None
ABSTAIN:	(0)	None

ATTEST:

Gail Blalock, City Clerk

APPROVED:

Henry C. Manayan, Mayor

APPROVED AS TO FORM:

for Steven T. Mattas, City Attorney

b) Maintain or locate the corporate headquarters in Milpitas

c) Demonstrate that the facility is required for the substantial expansion of an existing licensed business in Milpitas

d) Demonstrate that the facility is primarily devoted to product and technology research and development

5. Reduce the levels of air pollutants, urban runoff, and noise pollution to the maximum extent feasible, and avoid discharges of pollutants which cannot be treated at the San Jose/Santa Clara Water Pollution Control Plant.

6. Contribute $2 (to be adjusted based upon Engineering News Record San Francisco Construction Cost of 6777) for every gpdpa over the limit of 12,000, or $29,000 for every gpdpsf of building area over the limit of 0.8 (whichever is greater), toward a city recycled water fund to be used for various recycled water projects. Fees shall be non-refundable in the event of subsequent discharge reductions.

The applicant shall be deemed to have complied with the minimum requirements of this Policy upon execution of an agreement with the City subject to the approval of the City Attorney. Said agreement shall be in a form suitable for recording with the Santa Clara County Recorder's Office.

The City Council may, at its sole discretion, waive or modify any of the minimum requirements as the Council may deem appropriate to accommodate the particular circumstances of the applicant.

(a) "High Dischargers " mean those users that discharge wastewater in excess of 12,000 gpapd or 0.80 gpdpsf.

Exhibit A

City of Milpitas
Policy For Granting Industrial Wastewater Discharges
Approved by Council, January 19, 1999

In recognition that sewage capacity is limited and that the Council by City Code has established that wastewater discharges into the sanitary sewer shall not exceed 12,000 gallons per day per acre (gpdpa) or 0.80 gallons per day per square foot (gpdpsf) of building area without Council approval, the Council hereby adopts this policy establishing criteria for granting sewage discharge requests in excess of said limits.

The City Council will, on a case-by-case basis, review industrial wastewater discharge applications for flows in excess of the above limits and decide whether to grant discharges in conformance to Title VIII, Chapter 2, Section 5.06 of the City Code. In recognition that sewage capacity is limited, and that criteria is needed to determine what discharges would be of most benefit to the economic, environmental and social well being of the City, the following are minimum requirements which must be met in order to receive Council consideration, except in extraordinary circumstances.

The applicant must:

1. Incorporate water conservation and recycling into their processes to the maximum extent feasible to the satisfaction of the City Engineer.

2. Agree to reduce wastewater discharge at a pro-rata rate (applied to all high dischargers (see note a) approved under this policy) if the Milpitas allocated capacity at the Water Pollution Control Plant is exceeded. The pro rata rate to each high discharger approved under this policy shall be calculated to reduce discharges to below the allocated capacity.

3. Agree to cost share, on a pro-rata basis, any local area improvements to the sanitary sewer with other local area high dischargers if necessary to achieve wastewater carrying capacity.

4. Be consistent with the city's economic development strategy. Until such strategy is developed and adopted, applicant must meet one or more of the following, with greater achievement increasing the likelihood of favorable review and approval:

a) Demonstrate that the resulting development will be one of the city's top tax revenue generators.