

Color Ad Packaging 630 Kernaghan Facility

Supplemental *Environment Act* Proposal Filing
EAB File 6123.00

Prepared for:

Color Ad Packaging

28 – 630 Kernaghan Ave.,
Winnipeg, MB R2C 5G1

On 5 August 2021, Color Ad Packaging submitted an *Environment Act* Proposal for the electro plating facility (the Facility) located at 28-630 Kernaghan Ave in Winnipeg Manitoba. Wood Environment and Infrastructure Solutions was retained by Color Ad Packaging to undertake the EAP. Subsequent to the filing of the EAP, the provincial regulatory authority, Environment and Licensing Branch (EAB), reviewed the EAP and requested additional information related to the EAP on 8 September 2021. This report provides the supplemental information requested by EAB.

The structure of the supplemental filing follows the questions posed by EAB and Color Ad's response.

EAB Question 1: Are the cylinder used for the engraving received from another or manufactured in house?

Color Ad Response: Cylinders used in the Facility are manufactured in house. There are approximately 5000 steel bases which are reused. The Facility will bring in new bases only if there is a specific need for particular circumference and there is not one in the inventory. To date less than 50 new bases have been brought into the facility. The old images are removed through grinding, which is water-based process without chemicals, and then the cylinder is buffed, again with no chemicals, and polished for reuse. The life span for the cylinders is indefinite.

Question 2: There is nickel, chrome and copper tanks are used. Can you elaborate the process flow how this are used and indicate any potential fume capture, treatment etc is in place?

Color Ad Response: The process related to the use of the tanks is as follows:

1. Nickel tank is used when steel bases are showing steel – i.e., nickel has worn off and exposed the steel. This tank is used to fully nickel plate the steel base so that copper can adhere to the base when copper plating. It takes approximately twenty (20) minutes for this process. The nickel tank is self-contained, with direct exhaust when in use, which vents to the outside of the building approximately 24 feet above the equipment and out through the roof.
2. Copper tanks are used to then adhere the copper plating to the steel bases. This tank is a self-contained unit. This tank is in use approximately six hours per day, with direct exhaust when in use, venting to the outside of the building via the roof. The tank contents are sampled daily to ensure the tank are balanced (i.e., no excessive copper sulphate). When lab results indicate there is an excess of copper sulphate, the tank is purged into a third tank which would be used for over plating using 80% of the sulphate. The Facility does not mass dump these tanks and has in place a reduce/reuse/recycle program.
3. Chrome tank is the final step in the process and is a self-contained unit. This tank is utilized approximately seven hours weekly with venting occurring only while the tank is in use, and it exhausts to the outside of the building through the roof. Prior to release to the atmosphere, the exhaust goes through a scrubber system. This is a three-stage washing system for air purification prior to release to the environment. The scrubber is a self-contained unit which has water released onto the filters to aid in purifying the exhaust. The water that is used in this process is returned to the chrome tank and reused. The scrubber is tested every four months.

Question 3: In the air emission section you have indicated traffic and heating and cooling system as the only source of emission. What about VOC from inks? Chromium from the Chromium trioxide, sulfuric acid mist etc.

Color Ad Response: Inks – Fifty (50) ml of ink is used for testing on the cylinder in the proofing press. The ink is applied, then a test run undertaken. The cylinder is then wiped clean with a paper towel dipped in acetate. The acetate is dispensed from a larger drum into a smaller enclosed container to facilitate ease of use. The Facility uses approximately 3-4L of acetate on a daily basis.

Chromium – as noted in the process above, chromium is only used in the chrome tank. Chromic replenish of 5 L (1,3kg per litre) occurs at 15000-amp hours with the addition of 2 L of mist suppressant surface tension, which is generally once in a seven-day cycle.

Sulphuric Acid – the copper tanks use a 50% sulphuric acid solution to balance the tank chemistry. Eight litres are a weekly average on 40000-amp hours to a 1500 L bath.

Question 4: Is there any emission control such as filter system or any other equipment around the processing area to reduce potential emission?

Color Ad Response: As noted above there is a scrubber system in place for the chrome tank to aid in purifying the exhaust prior to release to the environment. All tanks are direct exhaust through the roof, run only when the tanks are in use and are tested regularly for leaks.

Question 5: In Table 4-1 you listed Sulphuric acid and Chromium trioxide as VOC sources. Basically, these chemicals are not VOC. Please correct this and include all other VOC sources such as inks, solvents used etc.

Color Ad Response: Acetate is used to wipe down the cylinders after the test run in the proofing press. The Facility uses approximately 3-4L of acetate daily. Ink usage is approximately 400mls daily. SDS sheets for both are attached to this filing.

Table 1: Annual VOCs Mass Balance in Kilograms, Purchased & Released

VOC		January to March	April to June	July to September	October to December	Total
Acetate	Purchased	180	180	180	180	720
	Released	180	180	180	180	720
Inks	Purchased	15	15	15	15	60
	Released	15	15	15	15	60

Question 6: Can you discuss any potential emission of chromium as this element is carcinogenic if released to the environment above a certain concentration?

Color Ad Response: The chromium solution is made in house. Site personnel follow the manufacturers recommendations for mixing as well as follow the prescribed personal protection equipment that is required when using this chemical. The solution is a 50-50 mix of

chromium to deionized water. The 50-gallon drum of chromium is pumped into 5 L pail and then transferred into the chrome tank which contains the water.

Color Ad will be adding emergency procedures to its emergency response plan related to the use of chromium and actions required in the event of a spill or a release.

Question 7:

If an electroplating process is being developed with associated wastewater treatment system, it is recommended to provide more detailed information and reviewed with EAP. Otherwise, it will be later considered as a Notice of Alteration and undergo a separate environmental review.

Color Ad Response:

At the present time there is a new inhouse wastewater treatment system being piloted at the Facility. There are no drains in the Facility so all wastewater is routed to holding tots which are picked up by Miller Environmental for recycling and disposal as required, it went operational for testing at the beginning of October and its anticipated that it will be fully operational by the end of October. This should be considered as part of the EAP.

The process is as follows:

1. Stage one all wash sinks will be collected in 1000 litre holding tote (which is the current process, and this is tote is picked up by Miller Environmental for recycling).
2. Original pH of the holding tote will be 1 to 2.
3. Add approx. 2% ferrous sulfate (20% strength) to 1000 litres.
4. Agitate the solution for 30 mins.
5. Add 1% Sodium Hydroxide (50% strength) to 1000 litres pH should be around 9 at this point.
6. Allow to settle filter and adjust discharge to a pH 6-8 and carbon treat on the release.
7. Release sample to be maintained in house for 6 months.
8. Clean water held in holding tote and will be reused in the Facility (i.e., water for the tanks).

Additional Information

Attached to this report is a photo log illustrating the various components related to the various stages of the engraving process at the Facility



Photo 2: Chrome tank with venting



Photo 1: Chrome tank scrubber with venting to roof



Photo 3: Steel cylinders plated with copper



Photo 4: Steel cylinder that is being polished for Electro Engraving

	SITE PHOTOGRAPHS	Date Taken 20 September 2021
		Project No. WX19388
	Color Ad Packaging ENVIRONMENT ACT PROPOSAL 80-630 Kernaghan	Photo Log 2



Photo 5: Chromic Wastewater Tote - wastewater is piped into the tote via overhead piping. Totes are emptied by Miller Environmental approximately twice a year as limited amount of chromic wastewater is generated due to the water being recycled and reused during operations.



Photo 6: Sulphate Wastewater Tote – wastewater is piped into the tote via overhead piping. Totes are emptied by Miller Environmental approximately twice a year as limited amount of chromic wastewater is generated due to the water being recycled and reused during operations.

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		Photo Log 3



Photo 7: Overhead piping for moving wastewater from the three tanks (nickel, copper, and chromium) to holding totes.

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		Photo Log 4



Photo 8: New inhouse wastewater processing equipment. Wastewater will be put into the first tank and ferrous sulphate will be added and agitated. Sodium hydroxide will then be added and resulting pH is around 9. Allow to settle and then filter to get to a pH of between 6-8. Carbon treated prior to release if required. Very little sludge is generated, and the filter would be periodically inspected to remove any accumulations.



Photo 9: New inhouse wastewater processing equipment

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Photo 10: Inks used in the Facility's proofing press



Photo 11: Proofing press

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Photo 12: Proofing press exhaust is vented up and out of the roof and only operational when press is running.



Photo 13: Drum of acetate near proofing press

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