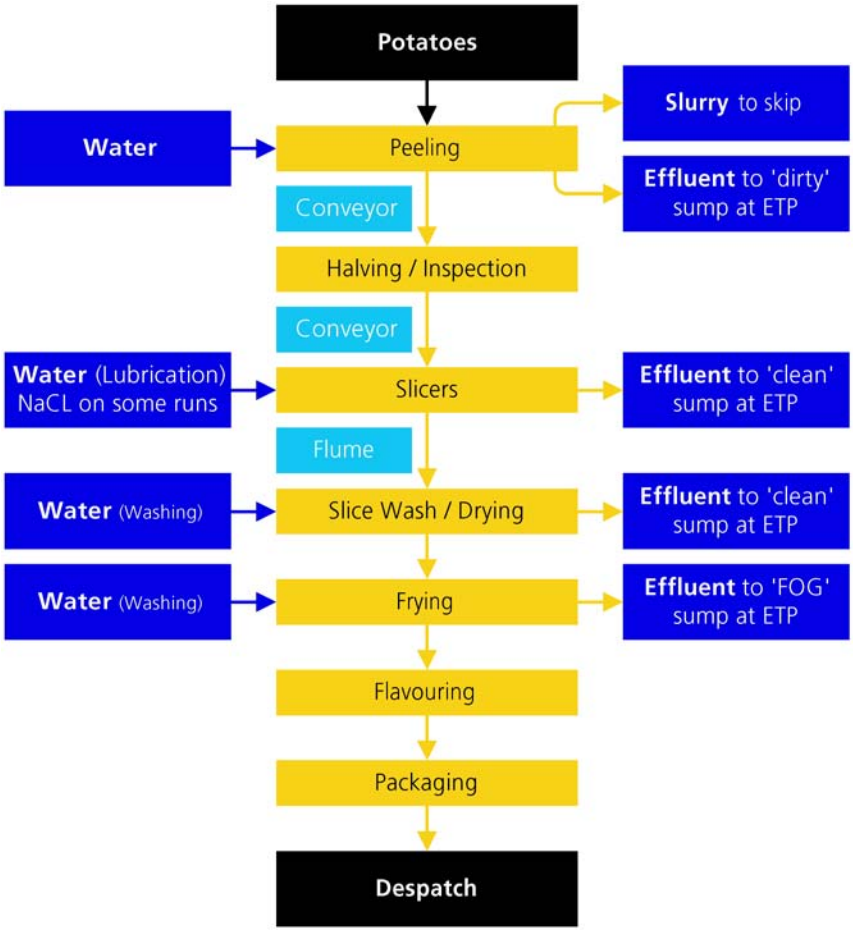
Food industry
Evaluation of effluent treatment plant



The customer produces potato crisps and uses around 183,000 m³ of water each year and generates approximately 149,000 m³ of trade effluent.

Anglian Water were asked for assistance by the customer to help them gain a better understanding of their water usage, effluent generation and effluent treatment plant performance.

The customers specific concerns were:

- Consent Compliance. The site had failed to comply with trade effluent consent limits on a number of occasions and had been formerly sampled for non-compliance.
- Plant Performance. Performance of the site effluent treatment plant was deteriorating, as was the quality of the final effluent being discharged to sewer.
- Operating Costs. Site water and wastewater costs were on the increase.
- Risk of Prosecution. The risk of prosecution and bad publicity was increasing.

Optimiser carried out an on site evaluation to:

- Improve the understanding of the effluent collection system.
- Establish the specific nature of the effluent discharged from the various production areas of the site.
- Estimate how individual effluent streams could impact on the overall effluent treatment plant performance.
- Review how the performance of the existing effluent treatment system could be optimised.

study findings

Optimiser attended site, traced the water & wastewater infrastructure and identified the major water and waste water users across the system. A hierarchy of the major water and wastewater users was then produced in the form of a schematic drawing.

A program of sampling was undertaken across the site to identify the high load effluent streams and their impact on the trade effluent plant. Optimiser focused on fats, oils and greases which was known to effect trade effluent compliance.

Optimiser identified the following areas of concern:

- Shock loading of the effluent plant took place when spillages occurred or water was dumped within the factory. Large flows from the main yard area also affected plant performance.
- An oversized and un-maintained fats, oils and grease system caused fats to solidify with in the system before they could be removed effectively.
- A centrifuge played a vital role in the site effluent treatment system, however when this was unavailable due a breakdown, high loads of COD were forwarded to the main effluent plant.

recommendations:

Optimiser recommended that the following issues needed to be addressed by the site:

- **Reduce solids loading on the plant** by fitting lockable and smaller aperture drain grates. Encourage dry clean up procedures within the factory and yard area.
- **Improve solids removal** from the final effluent by installing a new Spray Bar Wash System to facilitate auto-cleaning of the starch and dirty screens.
- **Evaluate how COD loading could be reduced** by installing a new standby centrifuge that could be used on either the starch or dirty treatment line
- **Reduce chemical shock loading on the plant** by optimising the use of chemicals during factory cleaning procedures.
- **Reduce plant odour problems.** To do this, the site firstly needs to investigate what alternative treatment options are available to treat fat, oil and grease.
- **Improve communications** between factory personnel and engineering staff who operate the effluent treatment plant. Any high discharges from the factory could then be communicated to engineering and the effluent treatment plant process could be optimised accordingly.
- **Further analysis required** of effluent flows to the dirty sediment tanks to better understand the impact of sediment on the final effluent quality.

benefits:

By gaining a detailed understanding of the site effluent, the customer now has a much better chance of:

- **Remaining compliant** with the site trade effluent discharge consent.
- **Reducing the risk of prosecution** / legal action being taken for Trade Effluent non-compliance.
- Being able to **continue production without restriction** from a trade effluent point of view.
- **Reducing water / wastewater costs.**

further progression:

After completing the original study Optimiser also:

- Fronted discussions with treatment plant suppliers regarding a new fats oils and grease removal system, enabling the customer to concentrate on their core business activity.
- Provided assistance with chemical jar tests so that settlement of the dirty effluent and fats oils and greases could be optimised..
- Carried out further trials to fine-tune changes to the effluent characteristics by optimising chemical usage.
- Provided practical advice to identify how the customer could manage and reduce costs through effective management of the site Maximum Daily Demand (MDD).