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## WATER USE AUTHORISATION: SECTION 27 MOTIVATION

# LAFARGE LICHTENBURG CEMENT PRODUCTION FACILITY, LICHTENBURG, DITSOBOTLA LOCAL MUNICIPALITY, NORTH WEST PROVINCE

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## MOTIVATION IN TERMS OF SECTION 27(1) OF THE NATIONAL WATER ACT, 1998

### S27 (a) Existing Lawful Water Uses

An existing lawful water use licence refers to the use of water which has taken place anytime during a period of two years before the establishment of the National Water Act. Lafarge Industries Ltd has been operational for over 60 years. No existing lawful water uses exist for the plant, however the following activities have been operational and are being applied for through a Water Use License Application:

- Section 21 (a) of Act - Taking water from a water resource (three boreholes from the plant, drinking water for the village, garden use and water taken from the NFEPA wetland for the kilns cooling process).
- Section 21 (c) of Act – Impeding or diverting the flow of a watercourse (Drainage and infilling of Wetland Map 5 which runs through the factory, rail and road crossings through Wetland Map 5).
- Section 21 (f) of Act - Discharging waste or water containing waste in a water resource through a pipe, canal, sewer, sea outfall or other conduit (the discharging of stormwater to the adjacent NFEPA wetland (Townlands Dam), stormwater runoff into a nearby tributary which flows into the Harts River).
- Section 21 (g) of Act - Disposing of waste in a manner which may detrimentally impact on a water resource (coal stockpile, returned water from cement processing to NFEPA wetland, treated effluent from sewage works, and stormwater runoff into NFEPA wetland).
- Section 21 (h) of Act - Disposing of water in any manner of which contains waste from, or which has been heated in any industrial or power generation process (Returning heated water to the NFEPA wetland).
- Section 21 (i) of Act – Altering the bed, banks, course or characteristics of a watercourse (Vehicle tracks, rail and road crossings through wetlands).

### S27 (b) The need to redress the results of past racial and gender discrimination

Lafarge recognises the need to redress the imbalances of the past and regards Black Economic Empowerment (BEE) to be one of the supporting pillars of the Transformation Process in South Africa. Lafarge draws on Corporate Centre for its human resource management and development strategies and planning which supports employment equity. Employment opportunities are directed towards local people, upholding the affirmative action, equal employment policies of the company. The following plans are implemented at Lafarge to assist in the implementation of Mining Charter objectives to redress imbalances of the past:

#### **Training:**

All employees, especially designated group members, are encouraged to participate in voluntary programmes that increase their skills or knowledge. Selection of candidates for Company training programmes is made solely on the basis of performance, development and potential without regard to race, creed, colour, sex, national origin, age or disability or any of the other categories of discrimination described in the Employment Equity Act.

#### **Development:**

Departmental managers ensure that procedures are established to ensure the upward mobility and growth of all suitably qualified employees, with due emphasis being placed on the promotion of designated employees.

Promotions and transfers are carried out without regard to race, sex, colour, creed, age, national origin or disability or any other discriminatory category. Exceptions may occur that fall within the implementation of the Company's employment equity initiatives, after due consideration of the inherent requirements for the position.

**Compensation, benefits, use of facilities:**

Each operating unit ensures that there is no unfair discrimination in matters of compensation and benefits for its employees. All Company facilities are continued to be maintained on a non-racially segregated and equal basis and with due regard to access and mobility for disabled employees.

**Social and recreational activities:**

All Company sponsored social and recreational activities are on a non-segregated basis. Management and supervisory personnel encourages all employees to participate in Company sponsored social and recreational activities to the fullest extent possible.

**S27 (c) Efficient and Beneficial Use of Water in the Public Interest**

One of the principles of the National Environmental Management Act (Act No. 107 of 1998 as amended) (NEMA) in section 2 (4) (o), states: "The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage."

As a public trustee of the water resources, the Department of Water and Sanitation (DWS) must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all users.

Within the town of Lichtenburg, groundwater is used extensively for municipal, domestic, industrial and agricultural practices. Water demands from groundwater sources are therefore highly stressed. Lafarge has ensured minimum additional stress on this resource by operating a dry process for the manufacturing of cement. During this process, water is abstracted for the main tank and circulated throughout the additional softening plants and kilns. Additional water for cooling purposes is extracted from the NFEPA wetland (Townsland Dam) but is returned after use.

Lafarge acknowledges the impacts imposed on the wetland system situated at the factory site (Wetland Map 5) and rehabilitation and management plans to restore this wetland area are underway. The result of this process will be that water will flow freely again through this system improving its overall condition. The improvement in this wetland condition will provide vital ecosystem services to the surrounding area such as; stream flow regulation, sediment trapping, nitrate assimilation, toxicant assimilation, biodiversity maintenance, and grazing for livestock.

Additionally, Lafarge plans to implement a number of pollution control dams in which water will be purified and reused within the cement factory. Surplus water produced from this process after sufficient purification, has the potential to be released into the receiving environment which will be highly beneficial to the largely arid area.

**S27 (d) The Socio-economic Impact of (i) the Water Uses(s) if authorised; or, (ii) of the Failure to authorise the Water Uses**

The authorisation of water uses for the Lafarge cement plant will provide the following socio-economic benefits:

- The North West Province is a growing market surpassing national trends in the cement industry and, as such, demand for Lafarge's products in the North West Province has already exceeded existing production capacity. The proposed expansion is therefore required to meet the growing product demand and ensure that provincial and national economic development is not hampered;
- Job retention - approximately 345 people are employed on a permanent basis in addition to temporary and contract employment;
- Local economic benefits are derived as a result of wage income and increased demand for goods;
- Training is provided to employees resulting in an improvement of the local skills base;
- Support is given to the local and national economy by the purchase of goods and services;
- Lafarge will achieve profits from the increase in the production of cement resulting in increased tax revenues for the government;
- Lafarge will continue to support projects that will benefit the local community leading to improved living conditions and improvement of skills;
- Support to local municipality in terms of road repairs, road construction, upgrading of youth centres, town clean-up, water supply etc;
- Support to schools in terms of adopt a school, fundraising campaigns, sport activities, giving books to learners, waste recycling projects;
- Support to small enterprises namely historically disadvantaged communities, courier services, tent hiring, shirt printing, gardening services, maintenance contractors etc; and
- Initiation of historically disadvantaged community business forums.

If the water uses are not approved the continuation and future expansion of the Lafarge cement production line will not occur. As such the socio-economic benefits outlined above will not be achieved. Consequently, the South African economy will be negatively affected and the livelihood of communities will not improve as expected.

### **S27 (e) Catchment management strategy applicable to the relevant water resource**

The Lafarge cement production facility is situated within the upper reaches of the Harts River Catchment (C31A) and falls under the Lower Vaal Water Management Area. A drainage line can be found along the eastern boundary of the cement factory which drains into an unnamed tributary, and eventually discharges into the Harts River. The Harts River flows along the south west of the factory discharging into the Hart River which then flows southwards to the Vaal Dam (downstream of the Vaal River) and then to the Orange River. The Lower Vaal catchment management strategy highlights the importance of groundwater in this area and suggests that the quality and quantity of this water resource be monitored (DWAF, 2004). Lafarge has upheld this policy through a Geohydrological report for Lichtenburg Cement Factory which has indicated recommendations for borehole use to reduce stress to groundwater supplies.

The following recommendations have been suggested:

- A geophysical survey should be completed to determine the best positions for drilling of monitoring boreholes;

- At least two monitoring boreholes must be drilled in the vicinity of the project site. Depending on the subsurface structures the area just north and south of the project site should be explored for the drilling of the monitoring boreholes;
- The monitoring boreholes should be yield tested in order to obtain the necessary aquifer parameters like transmissivity and hydraulic conductivity for input in the calibration of the numerical groundwater flow and transport model;
- A numerical groundwater flow and transport model must be compiled and calibrated in order to determine the potential risk for contamination of the aquifer; and
- The monitoring boreholes should never be utilised for abstraction purposes.

#### **S27 (f) The likely effect of the water use to be authorised on the water resource and on other water users**

Lafarge has been operational for over 60 years. As such, few new risks are posed to the surrounding wetlands and watercourses. The wetland situated within the cement factory property (Wetland Map 5) has experienced a disruption of surface water flows as a result of infilling from the factory waste. However, Lafarge is currently in the process of rectifying this non-compliance which will improve the overall condition of the wetland (JG Afrika Wetland Assessment Report, 2022).

The most prominent new impacts may be directed towards changes in water quality and quantity; particularly of the NFEPA wetland (Townlands Dam) situated 70m outside the factory boundary. Possible impacts to this system include:

- Some stormwater from the factory currently flows into the NFEPA wetland (Townland Dam). If stormwater runoff and the separation of clean and dirty water at the plant are not appropriately managed, water quality in the wetland may be compromised. Multiple stormwater channels at the plant were found to be blocked with sediment which can negatively affect inflowing water quality. Fine sediments which may be present in stormwater may also impact aquatic biodiversity. Seepage from the wetland, which then contains stormwater contaminants, may contaminate the groundwater resources. Contaminated groundwater would impose health risks to the surrounding communities which rely on this water source for domestic uses.
- Stormwater management around the coal stockpile was found to be insufficient during a site visit by JG Afrika. Runoff from this stockpile has the potential to negatively affect downstream environments.
- Spillage of additives in the storage area may negatively affect downstream environments. Magnetite, Vanchem Bauxite, Zimalco Aluminium Dross, Silica sand and Pozz Sand (Fly Ash) are stored in the additives area.
- Seepage of contaminated water into the Harts River may impact negatively on livestock and small wildlife which drink from the river. According to the Stormwater Management Report (JG Afrika, 2022), a number of channels within Area A of the plant were found to be blocked or undersized which could likely affect the water quality entering the Harts River. Recommendations were given to rectify this issue.
- Hydrocarbon spills were evident during the site inspection by JG Afrika. These pollutants can enter downstream environments affecting water quality.
- Agriculture is an important land use in the surrounding area. Contaminated groundwater and/or river water used for irrigation may affect crop growth or render the crop unsafe for consumption.

- At present, the uptake of water from the wetland for use in the factory does not have an effect on the wetland water levels. However future water demands of the factory may increase pressure on the wetland resulting in reduced water levels, affecting the ecological functioning of the system.

Groundwater is currently of good quality and it is anticipated that operations, run-off from the plant and seepage from the unlined coal and gypsum stockpiles will not negatively impact this resource. Impacts from these sources have not yet been felt by the well field after more than 50 years of operation, but require close monitoring. The following measures are in place or planned to prevent water resource impacts (JG Afrika Stormwater Management Plan, 2022):

- Refining the Stormwater Management System and the installation of several new pollution control dams;
- The water discharged into the wetlands should be monitored through water quality sampling;
- Water pumping to the factory from the wetland must be stopped once the water level within the wetland drops below a specified level;
- Flow meters should be installed on water supply lines throughout the plant;
- The area used for coal stockpiling has been reduced and the remaining stockpile area is in the process of being covered;
- The coal stockpile yard should be lined;
- Stormwater channels should be frequently cleared of sediment and vegetation;
- All oil drums should be stored in bunded areas and lined;
- Channels around the Additives area should be constructed and directed towards a pollution control dam; and
- The recommendations and conclusion of the geohydrological specialist report must be kept in mind in terms of monitoring.

### **S27 (g) The Class and the Resource Quality Objectives of the Water Resource**

The Lafarge cement factory falls within the quaternary catchment C31A of the Harts River. This river, along with the Molopo, Kuruman and lower reaches of the Vaal River form part of the Lower Vaal Water Management Areas.

Resource quality objectives have not been set for the water resource catchment C31A, although the adjacent quaternary catchments (C31B and C31C) have been given a Present Ecological State (PES) of Moderately Modified (Class C). (DWS Government Gazette No. 470 of 22nd April 2016).

When looking at the site-specific PES, the Wetland Map 5 (which runs through the cement factory) has been identified as having a PES Category E. This is in light of the infilling of the wetland area. The wetland health tool could not be used to ascertain the PES of the NFEPA wetland as the requirements for this wetland could not be met. Instead the PES of this wetland was based on a comparison with other mined pits in the area. The NFEPA wetland was therefore rated as having a variable PES, ranging between a Category D and B.

### **S27 (h) Investments already made and to be made by the Water User in Respect of the Water Use in Question**

Lafarge currently operates 166 cement plants in 50 countries around the world with a production capacity in excess of 200 million tons. With the South African domestic market for cement growing, Lafarge is likely to continue to invest in its South African plants to expand production and ultimately

profits. Increased expansion and profits may lead to further local employment opportunities and support to local municipalities, schools and community upliftment projects.

### **S27 (i) The Strategic Importance of the Water Use to be Authorised**

The continued operation of the Lafarge cement factory will be of strategic importance to Lafarge South Africa (Pty) Ltd, the local community and the South African economy in general. Increased production associated with the expansion of the production lines will improve socio-economic development as stated in the above. Rehabilitation plans for Wetland Map 5 will also improve the overall ecological state of the wetland, which will be beneficial to the community and the environment.

### **S27 (j) The Quality of Water in the Water Resource which may be required for the Reserve and for Meeting International Obligations**

Water quality investigations on free water at the Lichtenburg plant were undertaken as part of the approved EMPr (1995) and EMPr amendment (2006). Water samples were submitted to scientific services on the 8<sup>th</sup> January 2016 (Test Report 2016-10338). Results were as follows:

- The organic content (TOC) was insignificant and much lower than the limit of 10 mg/L as prescribed by SANS 241: 2015. There was no noticeable activity of bacteria associated with such problems.
- No toxic or harmful concentrations of any elements were found.
- The water quality was deemed suitable for a number of uses (drinking, aquatic life, animal use, agricultural use and recreation).
- Additional water samples were taken from a number of locations. The samples were classified in terms of the DWAF Water Quality Guidelines. These results showed that generally, the surface water and groundwater quality of the samples taken from the localities listed above are of ideal and good water quality.

Please refer to the water monitoring results attached in Appendix C in the Water Use Authorisation Technical report for details.

### **S27 (k) The Probable Duration of any undertaking for which a Water Use is to be Authorised**

The licence is required for the duration of the life of the mine which is of 90 years. It is however noted that water uses are licensed for 20 years and are subject to review every five years. It is therefore recommended that the Section 21 water uses for the cement production factory be issued for a period of 20 years.



**References:**

Department of Water Affairs and Forestry, South Africa. 2004. Lower Vaal Water Management Area: Internal Strategic Perspective. Prepared by PDNA, WRP Consulting Engineers (Pty) Ltd, WMB and Kwezi-V3 on behalf of the Directorate: National Water Resource Planning. DWAF Report No P WMA 10/000/00/0304)