NTNU – Trondheim
Norwegian University of
Science and Technology

The Effects of Macronutrient Enrichments (ammonium) on the Distribution of Four Bioactive Trace Metals (Cd, Mo, Ni, Cu) in Seawater and Planktonic Biomass.

Annie Vera Hunnestad

Environmental Toxicology and Chemistry

Supervisor: Trond Peder Flaten, IKJ
Co-supervisor: Murat Van Ardelan, IKJ

Norwegian University of Science and Technology
Department of Chemistry

El río anuda al mar su lamento obstinado…

- Pablo Neruda

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Abstract

Environmental impacts of aquaculture can be widespread and serious, and one of the problems connected to this activity is the release of waste in the form of macronutrients. One important aspect is the potential of a shift in the available nitrogen form from nitrate to ammonium. This has the potential of causing harmful algal blooms, and changing the composition of pelagic microbial communities. Because trace metals are linked to enzymatic transformations of nitrogen it can be expected that a shift in the available nitrogen form to also change the cycling of trace metals in the water column and the microbial uptake.

This work presented in this thesis has been part of the large collaborative WAFOW project, and was carried out at the Huinay Scientific Field Station in the Comau Fjord (Northern Patagonian region of Chile). The experiment was designed to follow changes in different variables as a gradient of ammonium was added to different bodies of water (mesocosms). Two types of water were studied (surface and ~10 m depth), and five treatments with increasing ammonium flux were carried out for each water type. In this thesis the variations in the distribution of four different trace metals (Cd, Mo, Ni and Cu) with an increasing ammonium flux has been studied. Samples were analyzed for chelex labile and DGT labile forms of the metals, as well for metal concentration in different size fractions of particles.

The enrichment by ammonium caused a bloom in biomass, and caused changes in the distribution of all four metals studied. Most of the metals showed decreasing chelex labile and DGT labile concentration with rising ammonium concentration. For cadmium there was a marked increased uptake per g carbon up to a certain point of ammonium enrichment, and a marked decreased uptake per g carbon when very high amounts of ammonium were added. This suggests that the very high ammonium enrichment scenario somehow has had an inhibiting effect on phytoplankton cadmium uptake. For molybdenum there was a decreasing uptake per g carbon with increasing ammonium flux. This is probably caused by a decreased need for molybdenum in enzymatic transformations of nitrogen when ammonium is supplied in place of nitrate.

Sammendrag

Miljømessige effecter forårsaked av av akvakulturaktivitet kan være varierte og alvorlige, og ett av problemene relatert til denne aktiviteten er utslipp av makronæringsstoffer. Spesielt viktig er det faktum at dette kan føre til et skift i den tilgjengelige nitrogenformen, fra nitrat til ammonium. Denne typen utslipp kan potensielt føre til skadelige algeoppblomstringer og en endring i sammensetningen av det pelagiske mikrobielle samfunnet. Fordi spormetaller er linket til enzymatiske transformasjoner av nitrogen kan man forvente at skiftet i tilgjengelig nitrogenform også kan endre visse spormetallers syklus i vannsøylen og i mikrobielt opptak.

Arbeided presentert i denne oppgaven har vært en del av samarbeidsprosjektet WAFOW, og ble utført ved Huinay Scientific Field Station i Comau fjorden (nordlige Patagonia, Chile). Eksperimentet ble designet for å kunne følge endringer i ulike variable ettersom en gradient av ammonium ble tilsatt til ulike mesocosm tanker fylt med sjøvann. To typer vann ble studert (overflate og ~10 m dybde), og fem ulike oppsett med økende ammonium gradient ble undersøkt for hver vanntype. I denne oppgaven blir det studert hvordani distribusjonen av fire ulike spormetaller (Cd, Mo, Ni og Cu) varierer med en økende ammonium gradient. Analyser ble utført for chelexlabile og DGTlabile former av metallene, i tillegg til analyser for metallkonsentrasjoner i ulike størrelsesfraksjoner av partikler.

Tilsetningen av ammonium førte til en algeoppblomstring, og endret distribusjonen av alle de studerte spormetallene. De fleste metallene viste minkende chelexlabile og DGTlabile konsentratsjoner med økende ammoniumkonsentrasjon. For cadmium var det et økende opptak av kadmium per g karbon til et visst punkt av ammoniumtilsetningen, men et markert minkende opptak da ammoniumkonsentrasjonene ble svært høye. Dette antyder at scenarioet med svært høye konsentrasjoner av ammonium på noe vis inhiberer phytoplanktons opptak av cadmium. For molybden var det et synkende opptak av molybden per g karbon med økende ammoniumkonsentrasjoner. Dette er mest sannsynlig grunnet et avtagende behov for molybden i enzymatiske transformasjoner av nitrogen når tilgjengelig nitrogenform endres fra nitrat til ammonium.

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1 Introduction

The farming of salmon is a growing industry taking place in fjord systems, where Norway and Chile are two of the major producers. The amount of waste released from aquaculture is growing with the industry, yet the knowledge of how this waste release affects marine ecosystems is inadequate (Cloern, 2001, Olsen, et al., 2006). This lies in the foundation of the WAFOW project (*Can Waste Emission from Fish Farms Change the Structure of Marine Food Webs? A comparative study of coastal ecosystems in Norway and Chile*), of which this thesis is a part.

The waste from aquaculture contains a large amount of dissolved inorganic nutrients from fish excretion (NH_4^+ and PO_4^{2-}), particulate organic nutrients from defecation, and dissolved organic nutrients from resuspension from the particulate fractions (Olsen and Olsen, 2008). The majority of nitrogen wastes released to open water will therefore be in the form of NH_4^+.

The nitrogen cycle is of particular importance when looking at the challenges connected to aquacultural waste. In marine ecosystems, nitrogen is assumed to be the limiting macronutrient for biological production. In fjord regions, such as the ones in Chile and Norway, nitrogen is contributed mainly as nitrate (NO_3^-) from incoming, nutrient rich deepwater or in surface layers through run-off from agricultural fertilizers. Nitrogen thus occurs in its oxidized state, which renders it necessary for the phytoplankton to exert different metabolic processes so that, in the end, the organism can utilize the element in the form of ammonium (NH_4^+). These processes; reduction of nitrate to nitrite and further reduction to ammonium, involves the enzymes assimilatory nitrate reductase and assimilatory nitrite reductase. Nitrogen incorporated in organic matter can also be liberated as ammonium (or organic forms), through different biological processes. It is also expected that NH4 discharge may cause a significant shift in the molecular structure of the DOM produced by phytoplankton (Murat Ardelan, personal communication)

The processes involved in the nitrogen cycle are in different ways linked to or dependent on different micronutrients in the form of trace metals. Some of the most important trace metals in this respect (and also in connection with the carbon cycle) are Cd, Co, Cu, Fe, Mn, Mo, Ni and Zn. These metals are all involved in different biological processes connected to the carbon and nitrogen cycles (Morel and Price, 2003). As trace metals are involved in the nitrogen cycle, especially in the steps where nitrate and nitrite are reduced to ammonium, a change in available nitrogen form, from nitrate to ammonium, may also affect the need and hence uptake of these different trace metals.

All transformations of nitrogen involve metalloenzymes, and it is possible that low metal availability limits critical steps in the nitrogen cycle. An example of this can be limited ability of urea assimilation by plankton, due to low concentrations of Ni, a cofactor I urease. Another example is the hypothesis that low availability of Cu in oxygen minimum zones can be responsible for release of N_2O to the atmosphere, due to low nitrous oxide reductase activity (Morel and Price, 2003). The trace metals influence the carbon cycle in an indirect way, through their effects on the nitrogen cycle, but they also have a direct effect on respiration and photosynthesis at cellular and ecosystem levels.

Thus we can point out that planktonic microorganisms control both chemistry and cycling of biologically important trace metals in the sea. At the same time, the metals will partially control the growth of these organisms and their cycling of macronutrients, such as C and N. This mutual interaction results from the complex coevolution of planktonic life and ocean chemistry. Knowledge is still scarce on phytoplankton's capacity for biological uptake and metabolism of macronutrients (such as nitrogen), linked to the bioavailability of some trace metals, in a nutrient modified scenario as the one we see in areas surrounding aquaculture. Mesocosm experiments are designed to maintain large close environments for periods of weeks, giving the opportunity to simulate natural conditions that otherwise would not be possible, and thus enabling to study everything from ecological interactions to pelagic community responses to environmental perturbations in more realistic perspectives (Olsen, et al., 2006). In this way, the baseline of the WAFOW project consists in creating the conditions to simulate the nutrient enrichment occurring in fjord ecosystems due to salmon aquaculture in Norway and Chile, in order to evaluate the capacity of the marine microbial communities to assimilate the incoming nutrient waste to mitigate possible environmental impacts in both ecosystems.

2 Objective and hypothesis

The objective of the work is to determine concentrations and variations in time of four different trace metals (cadmium, molybdenum, nickel and copper) in water and microbial biomass under specific experimental conditions. These conditions include the trapping of two types of water (marine and surface) in mesocosm tanks, and the addition of a gradient of $[NH_4^+]$ (one concentration per treatment). By doing said work under the given conditions, the impact of different NH_4^+ concentrations on the distribution of the four metals can be assessed with respect to its connection to the marine nutrient cycles and possible biological implications in the base of the pelagic marine food web in a fjord ecosystem.

Nutrient enrichment through the addition of NH_4^+ and PO_4^{3-} in different concentrations and ratios may alter the stoichiometry of the nutrient pool, as well as cause changes in nutrient cycling. The addition of NH_4^+ will also cause a shift in the available nitrogen form, from NO_3^- to NH_4^+. This shift is expected to simultaneously cause a change in the trace metal uptake of different types of phytoplankton, due to their role in the enzymatic transformations of nitrogen. This may in turn affect the trophic transfer of metals.

3 Background and theory

3.1 Study area

The Comau Fjord (42^{o}10' to 42^{o}50' N and 72^{o}40' to 72^{o}60' W) (figure 3.1) is located in the sub-Antarctic northern Patagonia, in the northernmost part of the Chilean fjord region.

Fjords are formed as glaciers carve rock and soil from the ground with great force, thus creating steep-sided valleys. This occurs at high altitudes. The formation of a moraine (mounds of glacial till) at the mouth of these valleys allows the valleys to retain water flooding in with rising sea levels. This moraine creates a barrier between the fjord and the greater ocean outside, and this can cause sluggish circulation near the bottom of the fjord (Pinet, 2011).

The Comau fjord is more than 40 km long and is characterized by steep slopes, under as well as over the water line. In the Comau channel the fjord has a maximum depth at 490 m, and the average depth of the entire fjord is 250 m. The fjord receives freshwater from river fluxes and precipitation which in turn is responsible for the formation of a low salinity layer that varies between 0.5 m (summer) and 10 m (head of fjord, winter). The phytal zone is not well developed in the fjord, due to diurnal tides with a maximum amplitude of more than 7 m. However, there are several benthic communities flourishing below the halocline (Galea, et al., 2007).

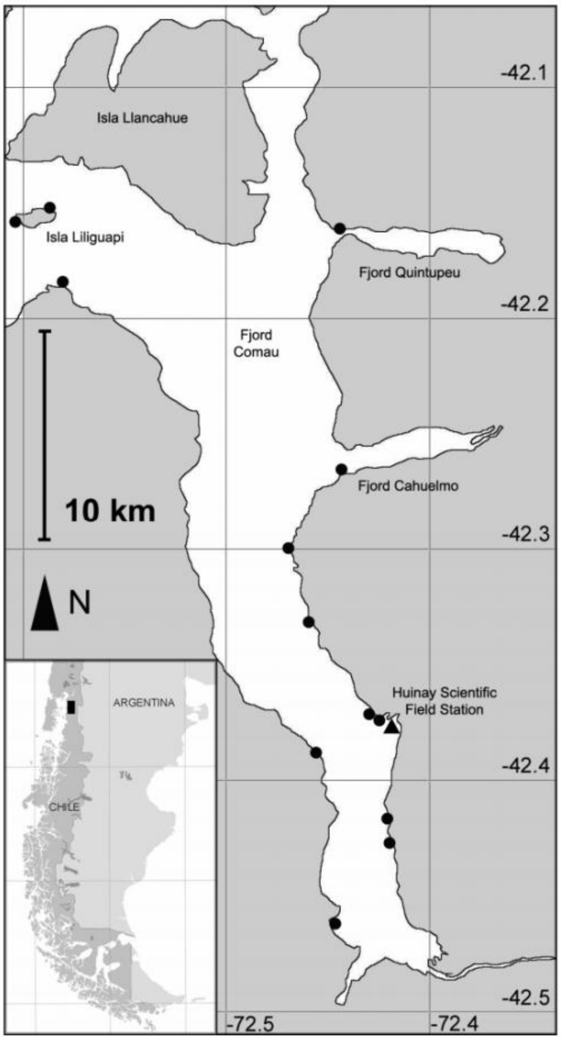


Figure 3.1: The Comau Fjord and its geographical placement (Galea, et al., 2007)

Because of the almost north-south disposition of the fjord, and the chain of mountains surrounding it, the fjord is relatively well protected from the predominant regional winds in southern Chile. Another important aspect influencing the oceanographic aspects of the fjord is the fact that it does not have a sill at its mouth. This fact might indicate that times of residence of bottom waters could be shorter than in other southern Chilean fjords (Häussermann and Försterra, 2009).

The Comau fjord displays a two layer system, with a permanent low salinity layer between the surface and 5-10 m depth. This is due to mixing of fresh water from precipitation and river input with the oceanic water, which results in a strong halocline. This in turn is the driving force behind the formation of a pycnocline. The depth profile of the salinity of the fjord is shown in figure 3.2. The low salinity layer, and the formation of the halocline and pycnocline, also means that the physical properties on either side of this border are different enough to result in two very different microbial pelagic communities (Sanchez, et al., 2011).

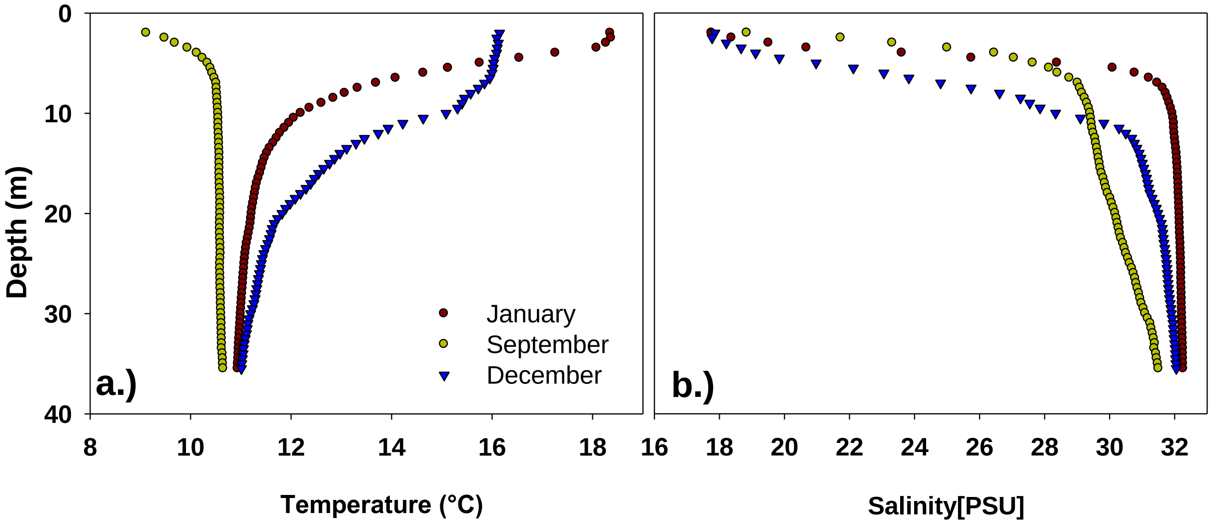


Figure. 3.2: Typical vertical distribution of a) temperature (°C) and b.) salinity (PSU; practical salinity unit) for three different periods (January, September and December) in Comau Fjord, Chile (modified from Sanchez et al. (2011).

3.2 Plankton in seawater

It is common to organize the plankton community according to size, ranging from single-celled organisms and other phytoplankton to larger predators (zooplankton). This community is functioning and interacting continuously (Steele, 2009). An overview of a typical plankton community is shown in figure 3.3. This figure shows the interactions between the different organisms, as well as classifying them according to their size.

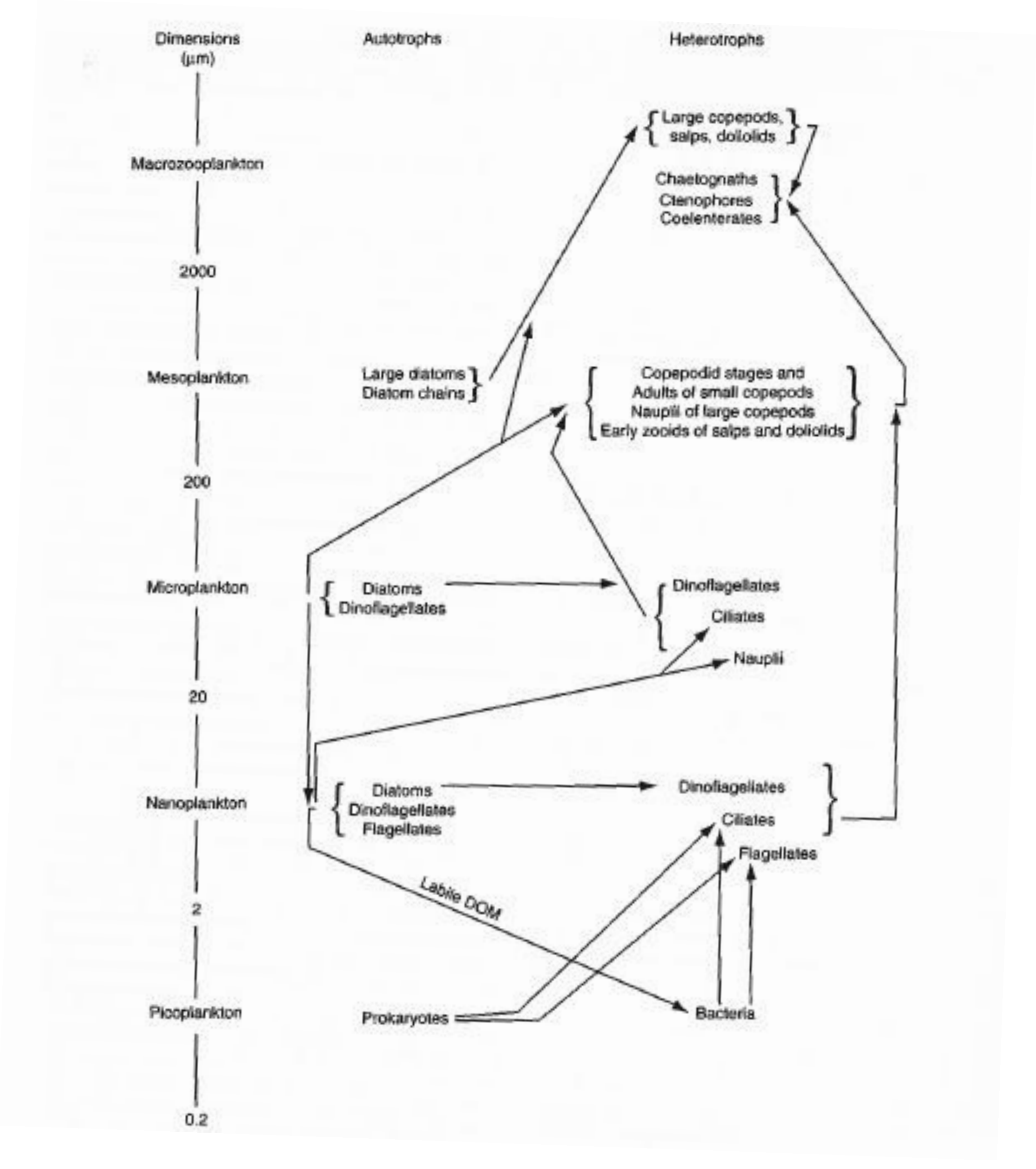


Figure 2.2: Interactions within a typical plankton community. The organisms are sorted according to size as well as whether they are autotrophs or heterotrophs (Steele, 2009).

Phytoplankton

In *Marine Biology*, phytoplankton are defined as unicellular organisms living in the upper illuminated waters of all aquatic ecosystems, that drift with the currents and who carry out oxygenic photosynthesis. A figure of a generalized phytoplankton cell is shown in figure 3.4. There are approximately 25 000 known species of phytoplankton, and typically several hundred species can be found in one single liter of seawater. Phytoplankton make up the base of the food chains in most marine ecosystems and are responsible for the production of almost half of the world's global net primary production; around 50 x 10^{15} g C/year. The cell size of phytoplankton ranges over at least nine orders of magnitude, from cyanobacteria with a cell volume around 0,1 μm^3 to large diatoms bigger than 10^8 μm^3 (Steele, 2009). These organisms, albeit small, are responsible for around half of Earth's total primary production (Morel and Price, 2003).

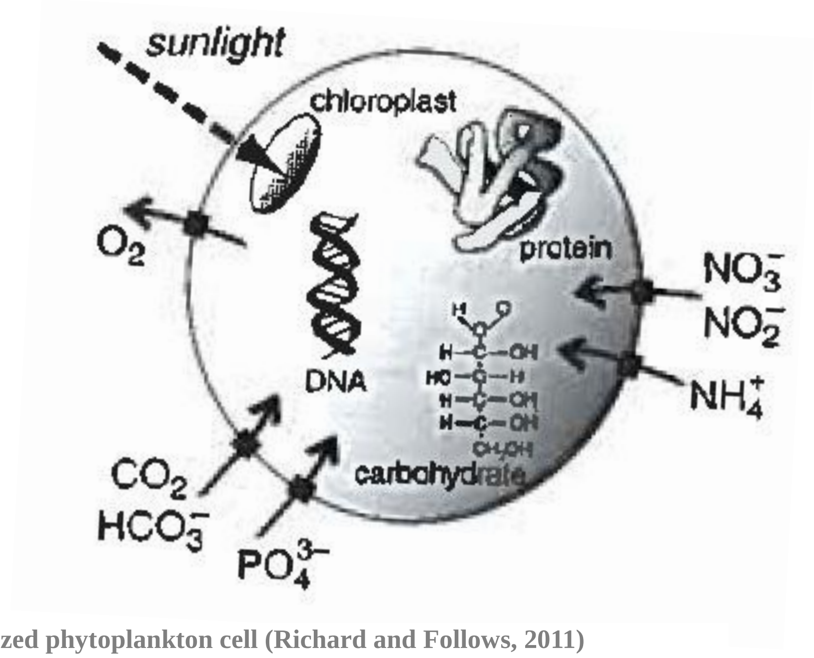


Figure 3.4: Generalized phytoplankton cell (Richard and Follows, 2011)

The general size classification of phytoplankton showed in figure 3.3 is found also in the work of Sieburth et al. (1978). Picoplankton is defined as cells with a diameter of less than 2 µm. Nanoplankton are cells with a diameter ranging from 2 to 20 µm, and Microplankton are cells with a diameter greater than 20 µm. The term netplankton is also sometimes used, for phytoplankton with a cell diameter greater than 35 µm (Glibert, et al., 1982a). Within the nanoplankton fraction planktontypes like nanoflagellates and certain dinoflagellates (e.g. *Gymnodium*) can be found.

The microplankton contain types like diatoms, coccolithophorids and flagellates, but also ciliates, which are in fact microzooplankton protists. Cyanobacteria, other bacteria and picoeukaryotes can be found within the picoplankton group (Kirchman, 2008). This list is short and incomplete, and just a quick overview of some of the planktontypes found within each of the sizegroups.

In 1995 the CIMAR (Centro de Instrucción y Capacitación Marítima) Program permitted systematic research on the composition and distribution of micro phytoplankton, primary production and chlorophyll distribution (among other parameters) in the austral Chilean channels and fjords. The program found that within the fjords, marine diatoms intermingled with morphotypes from low-salinity and continental waters. Species composition varies from north to south, and the variety of diatoms and dinoflagellates in the outer channels is greater than in the headwaters of the interior channels and fjords (Avaria, 2008).

According to the research done through the CIMAR Program, the quantitatively more important species in the the fjord systems are *Thalassiosira eccentrica*, *Pseudonitzschia cf. australis*, *Skeletonema costatum*, *Chaetoceros radicans*, *C. socialis, C. debilis, C. cinctus, C. laciniosus*, *Thalassionema nitzschioides*, *Stephanopyxis turris* and *Leptocyllindrus danicus (Avaria, 2008).*

Zooplankton

Our study area, located in the Patagonian fjord region, has a zooplankton community dominated by meroplanktonic crustacean larvae, dense aggregations of cladocerans, as well as an abundant and diverse community of epipelagic calanoid copepods (González, et al., 2010).

3.3 Aquaculture

During the past decade and a half, salmonid aquaculture has become the fourth largest economic activity in Chile. The production reached 550 000 t in 2004, making it the main aquaculture activity in the country. It accounts for 92,5% of all exported aquaculture biomass (Buschmann, et al., 2006).

Because of the presence of wave-protected bays, fjords and channels, aquaculture in Chile is mainly carried out in southern Chile (Buschmann, et al., 1996). A map of this area is presented in figure 3.5.

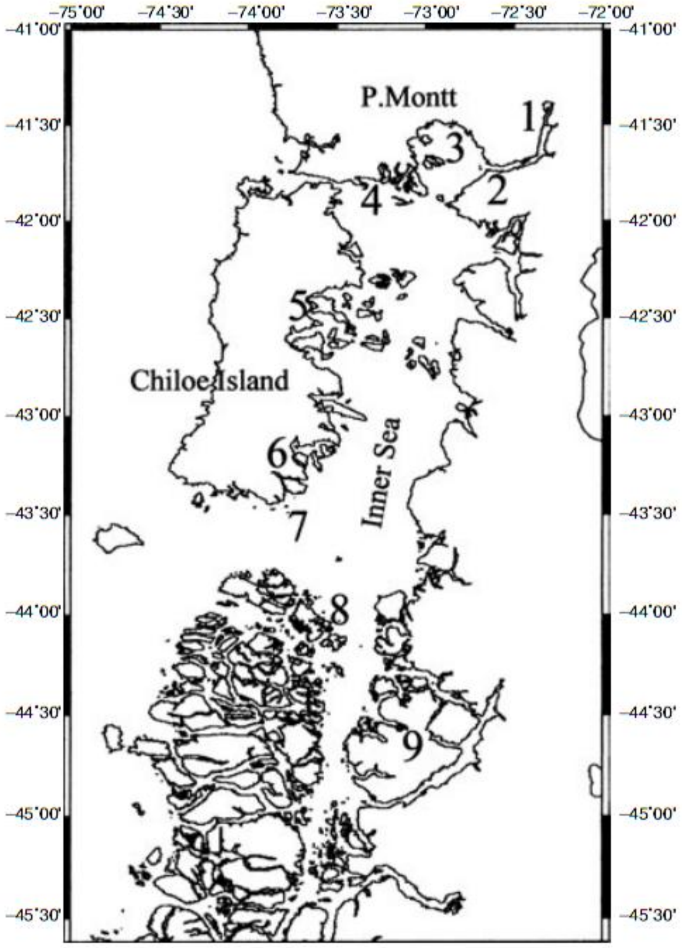


Figure 3.5: Area of aquaculture in Chile (Soto and Norambuena, 2004).

3.3.1 Environmental impacts of aquaculture

Many concerns have been expressed about the environmental impacts of aquaculture. Buschmann et al. (2006) mentions modification of benthic communities, increased nutrient loads in coastal waters (connected to problems of algal blooms), increased harvest of wild fish populations (for fish feed production), usage of potentially harmful chemicals and escape of farmed salmon into the wild (Buschmann, et al., 2006).

A study done by Troell et al. (1997) showed significantly higher concentrations of ammonium near the cages of salmon farms in southern Chile (Calbuco) compared to control areas.

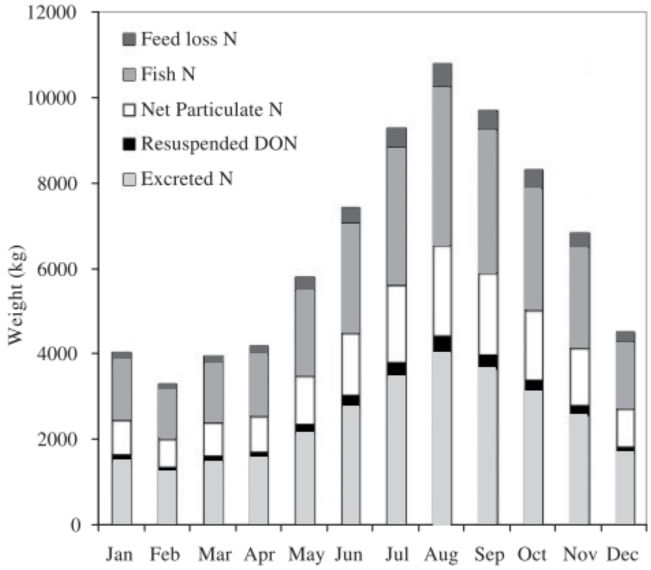
A large scale experiment carried out by Soto and Norambuena (2004) in the licensed salmon farming areas in southern Chile, covering eight salmon farm sites along 300km of coastline, showed that the benthic biodiversity was reduced by at least 50% on average. Another big problem is the occurrence of harmful algal blooms in coastal areas. These are the result of input of nitrogen from the salmon farms, and they have had impact on human health as well as natural and cultured marine resources (Buschmann, et al., 2006).

3.3.2 Macronutrients as waste from aquaculture

The target organism in a fish pond can only recover about 25% of the N added as feed or other nutrient input (Hargreaves, 1998) and Olsen and Olsen (2008) calculated the total nutrient wastes from a hypothetical fish farm producing 1000 metric tonnes net weight fish per year to correspond to the emissions from a community of 7,500 to 10,000 people (2 g P per person per day, 13 g N per person per day, Norwegian standard) (Olsen and Olsen, 2008). Figure 3.6 shows how feed N and P is distributed between feed loss, uptake, excretion, particulate N or P and resuspended DON or DOP.

Ammonia is excreted as the end product of protein metabolism, and an increase of total N and ammonia and a decrease of nitrate has been measured in the effluent from marine fish and shrimp ponds (Ziemann, et al., 1992).

Hargreaves (1998) describes phytoplankton uptake of dissolved inorganic nitrogen as the primary pathway of nitrogen removal in the ocean, with ammonia being the preferred N-substrate over nitrate. The reason for this is that enzymatic reduction of nitrate to ammonia within the phytoplankton cell is necessary before incorporation into cellular amino acids (Hargreaves, 1998). According to Krom et al. (1989) the regulation of dissolved inorganic nitrogen concentration in aquaculture ponds is mediated primarily by phytoplankton, and the study showed that short-term variation in ammonia concentration is inversely related to phytoplankton density.



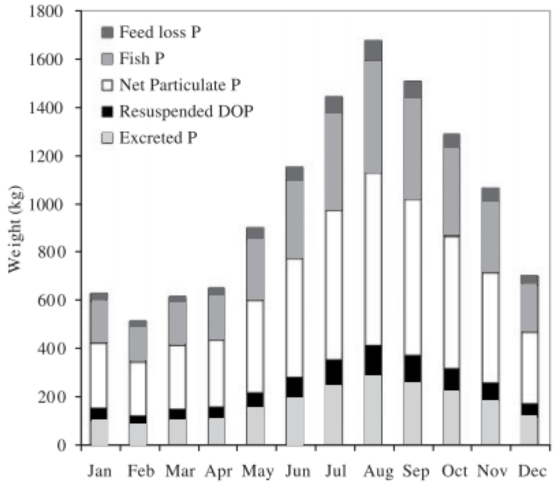


Figure 3.6: Annual variation in nitrogen and phosphorus deposition in fish biomass and waste components for a hypothetical CAS producing 1000 tonnes salmon per year. The sum of the fractions equals the food nitrogen and phosphorus supplied (Olsen and Olsen, 2008).

3.4 Cycling of important macronutrients and the influence of microorganisms

Marine microorganisms are responsible for about 50% of the Earth's primary production, and these same microorganisms play a very important role in the global cycling of nutrients (Arrigo, 2005). The macronutrients playing the most important role in the growth of phytoplankton and other marine plants are nitrogen, phosphorus and silicon. Out of these three, nitrogen is usually the major limiting nutrient to plant growth in marine waters (Kennish, 2001). Nitrogen and phosphorus normally exist in the ocean in proportional concentrations. This ratio is called the Redfield ratio and is expressed by $[NO_3^-] : [PO_4^{3-}] = 16 : 1$ (Stumm and Morgan, 1996).

An idealized model of a piece of ocean can be pictured as a two-box system; one box on top of the other (figure 3.7). The top box represents the euphotic zone at the surface. This is where phytoplankton take up nutrients necessary for photosynthesis. The bottom box represents the deep ocean. This is where essential elements from sinking biomass are remineralized.

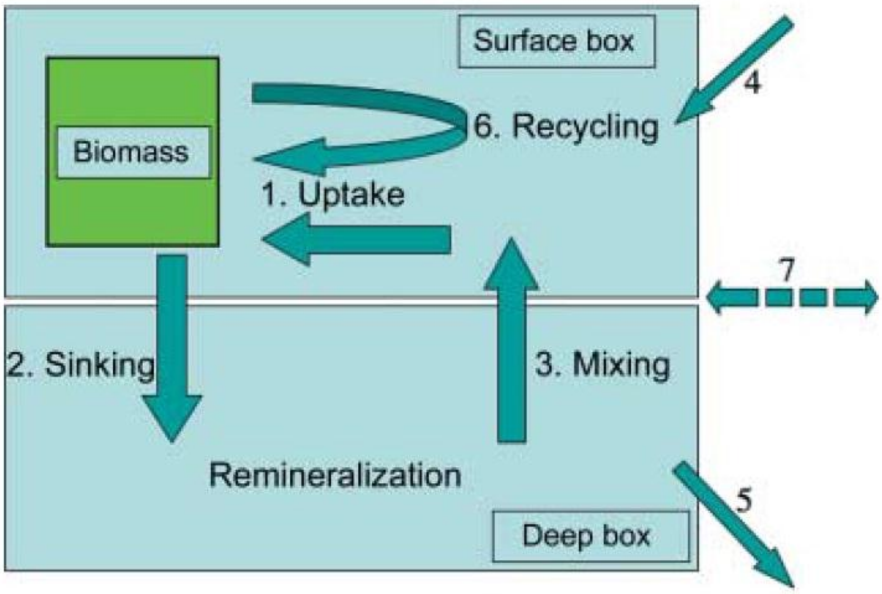


Figure 3.7: Diagram showing a two-boxed model of the open ocean, showing principal fluxes of nutrients (Morel, 2008).

The two-box model in figure 3.7 summarizes the cycling of nutrients in six processes; (1) Uptake by biota at the surface, (2) Sinking and remineralization of biomass, (3) Mixing (advection and diffusion) of remineralized nutrients back to the surface layer, (4) Input to the surface layer from the outside, mainly the atmosphere, (5) Output from the deep ocean to the outside (mainly atmosphere and sediments), (6) Recycling at the surface. The arrow marked (7) represents lateral fluxes, which account for distant influence of rivers and hydrothermal sources (Morel, 2008).

3.4.1 The nitrogen cycle

In seawater, around 10 % of the total nitrogen is found as inorganic and organic compounds, the remaining 90 % being N_2. Of the inorganic forms, nitrate, nitrite and ammonium are the most common. The main sources of nitrogen in seawater are the atmosphere, volcanic activity and inflow from rivers. Anthropogenic inputs are becoming more significant as well (Kennish, 2001).

The nitrogen cycle consists of several oxidation-reduction transformations of nitrogenous compounds, catalyzed primarily by microorganisms using specific enzymes (Zehr and Ward, 2002). Figure 3.8 shows a schematic overview of the global nitrogen cycle, with respect to the microorganisms involved in transformations of nitrogen species.

When it comes to the biological production of organic matter, nitrogen is considered to be a key limiting nutrient (Libes, 2009). High nutrient fluxes tend to promote the dominance of diatoms over flagellates (Turpin and Harrison, 1979, Harrison and Davis, 1979).

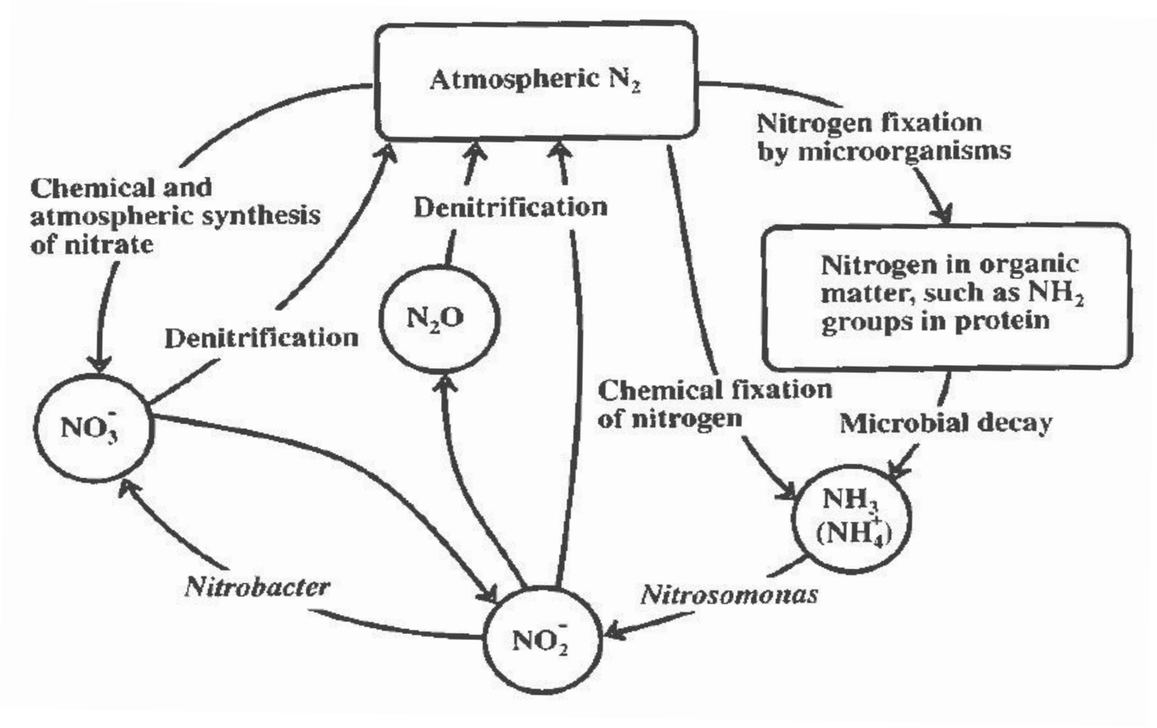


Figure 3.8: The biochemical transformations of the nitrogen cycle (Manahan, 2005).

Although it is assumed that most microorganisms can use inorganic nitrogen in the form of nitrate, nitrite and ammonium, studies have shown that some prefer one over the other. An example is the fact that some phytoplankton seem to prefer ammonium over nitrate. The reason for this might be the additional energy acquired as well as the absence of the need to perform enzymatic reduction of nitrate to ammonium within the cell (Zehr and Ward, 2002). Primary production in the nanoplancton size class has been shown to be largely based on ammonium. The same is true for the picoplankton fraction. For netplankton the main nitrogen form used for nutrition is nitrate (Probyn, 1985, Glibert, et al., 1982b, Wafar, et al., 2004).

Limitation of nitrogen is on the biochemical level visible through the reduced supply of amino acids. This in turn will limit the translation of mRNA which ultimately reduces the rate of protein synthesis, leading to a reduction of growth rate and photosynthetic rate (Barsanti and Gualtieri, 2006).

3.5 Trace metals and their role in a marine environment

Marine systems are subject to a constant change of conditions, which means they are practically never at a chemical equilibrium (van Leeuwen, et al., 2005).

3.5.1 Classification of metals

The A/B-classification used in Stumm and Morgan (1996) separates metals into class A, B and borderline metals. Class A are characterized as «hard» metals, meaning they have a noble gas configuration (d^0), which is associated with low polarizability (high spherical symmetry and electron sheats that are not easily deformed by electric fields). The class B metals have electron clouds that are more easily deformed by electric fields of other species (higher polarizability) and are called «soft» metals. In between these «soft» and «hard» metals we find the borderline or transition metals, which is the group most micronutrient metals belong to (Stumm and Morgan, 1996). This characterization also takes into account the different affinity metals have for various ligands and functional groups, something that is very important in biological systems. Class A ions prefer binding to oxygen binding sites, while class B ions prefer sulfur and/or nitrogen centers. Metalloorganic compounds of class A ions, as well as borderline ions (except Co) hydrolyze in contact with water, while several class B ions, the borderline metal Co and all metalloid metals are able to form element-carbon bonds that are stable in water. As for toxicity, class B ions are more toxic than the borderline ions, which in turn are more toxic than class A ions (Stumm and Morgan, 1996, Newman and McIntosh, 1991).

3.5.2 Speciation and bioavailability of trace metals

The chemical behavior of a trace metal, and thus its bioavailability is strongly dependent on the speciation of the metal. The effect of a certain element on the growth of algae depends on whether the element in question is present as a free metal ion or complexated (Stumm and Morgan, 1996). When it comes to uptake in cellular organisms the process is controlled in vast degree by the free metal ion in the solution (Hunter, et al., 1997). Also important is the availability of surface ligands and the metal affinity for these ligands, which is related to charge density and polarizability of the metal in question. In this respect phytoplankton can be viewed as suspended particles with ligands available for binding of metals (Fisher, 1986). The presence of other complexing ligands in the seawater may reduce the free ion activity by orders of magnitude compared to the total concentration in the water (Hunter, et al., 1997).

3.5.3 Biological role of trace metals in marine waters

The importance of trace metals in a biological context is dual, in the sense that they are important both as limiting nutrients and as toxicants. At elevated concentrations the limiting nutrients can also act as toxicants (Sunda and Huntsman, 1998, Hunter, et al., 1997). Around 30 % of all enzymes have a metal at the active site of the protein, and especially important in the enzyme activity in living organisms are the transition metals. The reason for this is the fact that these metals, such as iron, copper and molybdenum, can undertake one or two electron changes, which is of great importance in oxidoreductase enzymes (enzymes involved in redox reactions) (Reilley, 2004). The nitrogen and carbon cycles, and the trace metals involved in enzymatic transformations within these cycles are shown in figure 3.9.

Of the trace metals with known biological functions, the ones that have been most thoroughly studied by oceanographers are Mn, Fe, Co, Ni, Cu, Zn and Cd. These metals are relatively abundant in rocks and soil, but the concentrations in marine waters are much lower due to limited solubility as well as effective removal from the water column. This creates a concentration gradient from the coastline, where metal concentrations fall quickly even at short distances from the shore. In addition, metal uptake by phytoplankton serves to deplete trace metals at the ocean surface. As phytoplankton die or are eaten by zooplankton and incorporated into fecal matter, the accumulated metals sink with the biomass through the water column and might eventually settle as part of the sediments (Morel and Price, 2003).

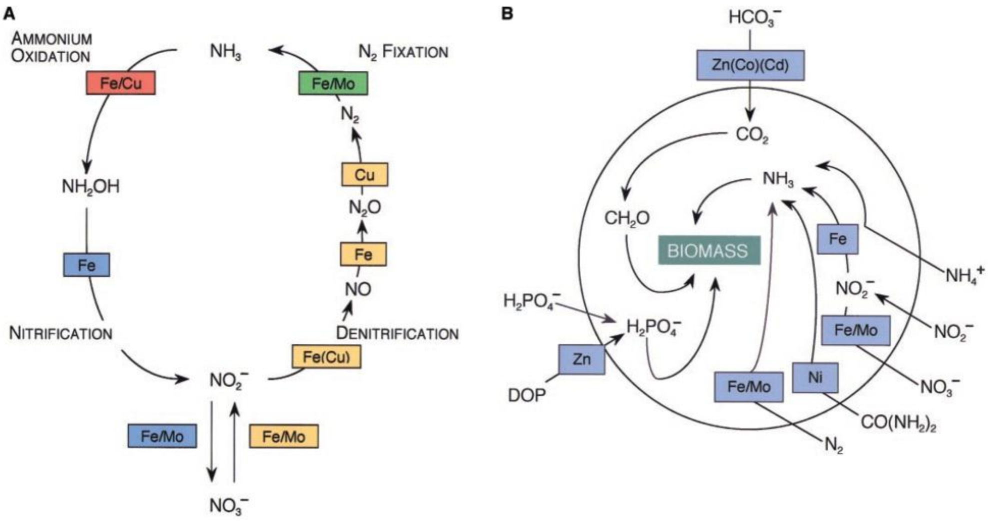


Figure 3.9: (A) The nitrogen cycle with its metal cofactors in the enzymatic reactions involved. The reactions are color coded according to reaction type. Red = ammonium oxidation, blue = nitrification, green = nitrogen fixation, yellow = denitrification. (B) Acquisition and assimilation off carbon, nitrogen and phosphorus by marine phytoplankton, illustrating the metals required for these processes. (Morel and Price, 2003)

Metal ions as micronutrients

As reviewed in section 3.4, both nitrogen and phosphate (as well as silicate) play important roles in marine biochemistry as limiting macronutrients Though these elements are without a doubt essential to phytoplankton growth, there is evidence that also other elements can be limiting factors. It has for example been shown that despite (extremely) high concentrations of phosphate, nitrate and silicate at latitudes south of 30°S (sub-Antarctic and Antarctic regions), there is no corresponding high phytoplankton growth. Additionally, these regions also show quite low pigment concentrations, indicating a low productivity, like the nutrient poor mid-latitude regions. In regions with high productivity, near continents, high pigment concentrations are observed. These observations imply that some other component, supplied from the continents, is necessary in photosynthesis and thus essential for phytoplankton growth (Hunter, et al., 1997).

The elements that are considered essential have a certain window of essentiality. For organisms to grow and reproduce normally, their access to these elements has to be within the concentrations determined by this window. For some elements this window is extremely narrow, meaning the dose of exposure determines whether the element will have a neutral/positive or toxic effect (Walker, et al., 2006). Figure 3.10 shows how performance of an organism is affected by rising concentrations of an essential and a non-essential element.

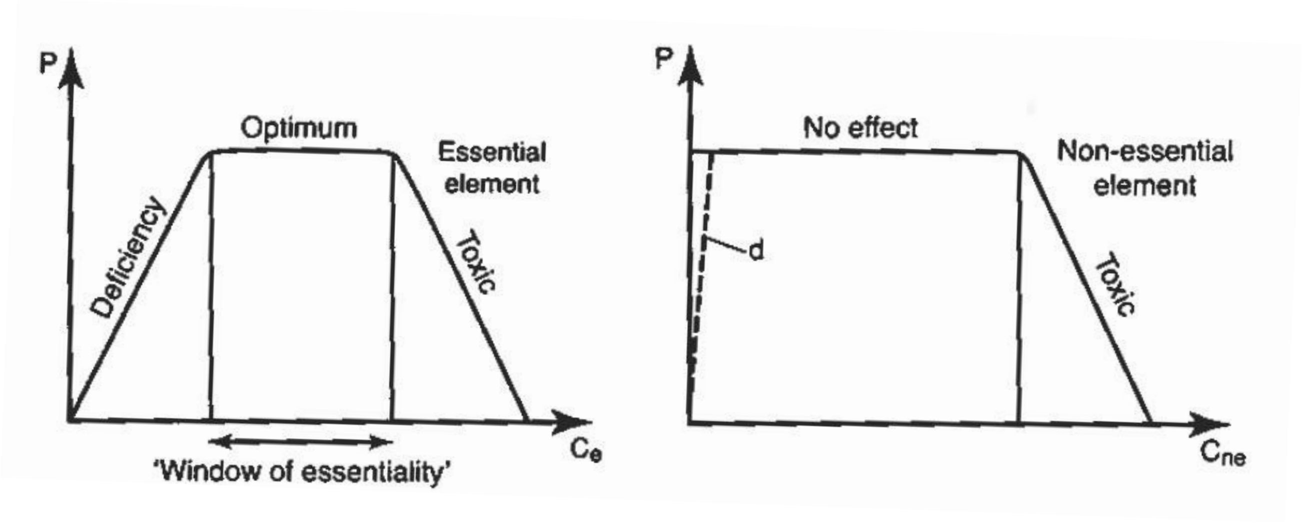


Figure 3.10: Relationship between performance (P) and concentration for an essential element and a non-essential element (Walker, et al., 2006).

Elements that are essential to phytoplankton will be taken up actively by these, and thus will most often show depth concentration profiles that have low concentrations in surface layers (where phytoplankton activity is high) and enhanced concentrations in deeper water as particles are broken down (Whitfield, 2001). Trace metals are important as cofactors in enzymes, and some of the enzymatic roles of the four trace metals studied in this theis are shown in table 3.1.

Table 3.1: Metal co-factors in a selection of enzymes (Stumm and Morgan, 1996, Lane et al, 2005).

Metal	**Enzyme**	**Function**
Cd	Carbonic anhydrase	Inorganic carbon acquisition
Mo	Nitrogenase Nitrate and nitrite reductases	Nitrogen fixation Nitrate reduction to ammonia
Cu	Plastocyanin Cytochrome C oxidase Ascorbate oxidase	Photosynthetic electron transport Mitochondrial electron transport Ascorbic acid oxidation and reduction
Ni	Urease	Hydrolysis of urea

Cadmium (Cd)

Cadmium is well known as a pollutant, but in the later years, evidence has been found that cadmium can also function as a micronutrient. Most of the cadmium found in the environment is found in correlation with Zn. Cd and Zn share external electronic configuration (completely filled d shell, d^{10}), giving them many of the same chemical properties. In water cadmium is found as hydrated Cd^{2+}, an ion that is capable of binding to a wide range of ligands (Rayner-Canham and Overton, 2006). The concentration profile of cadmium with depth has been shown to have a strong correlation with phosphate and nitrate; a nutrient type distribution which is depleted at the surface and has an increasing concentration with depth (Bruland, 1980, Saager, et al., 1992). Cadmium has also been shown to be enriched in phytoplankton to a greater degree than any other metal except iron in surface waters (Saager, 1994). It has been discovered that cadmium can be used in place of zinc in the enzyme carbonic anhydrase. This enzyme is used for inorganic carbon acquisition by phytoplankton (Xu, et al., 2008, Lane, et al., 2005). Natural concentrations of cadmium in open ocean surface water have been found to be in the range of about 1 nM (Collier and Edmond, 1984).

Molybdenum (Mo)

Mo is claimed to be the most biologically important metal in group 6 (Mo, Cr, W) of the transition metals. One of the reasons for it becoming so important might be its high aqueous solubility at pH values close to neutral, which makes transport easy within biological fluids. The molybdenum oxyanion is similar to the sulfate ion in size and form, and it has been argued that they are transported by the same mechanisms into and within organisms (Rayner-Canham and Overton, 2006). Because of the molybdenum oxyanions similarity to the sulfate ion, sulfate is a possible competitive inhibitor of molybdenum uptake (Cole, et al., 1993). One of the important enzymatic functions of Mo is its part in pterin-containing enzymes which are important as oxidants or reductants of toxic species in organisms. (Rayner-Canham and Overton, 2006). Molybdenum is also found at the active site of the enzyme nitrate reductase, which is an assimilatory enzyme (Kisker, et al., 1997), as well as in enzymes that are active in N_2-fixation systems (Cole, et al., 1993). Both of these enzymes are important in phytoplankton transformations of nitrogen (Morel and Price, 2003). In natural, oxygen containing waters, molybdenum is thought to be present primarily as MoO_4^{2-}, and natural concentrations range from ~1 to ~100 nM in open ocean surface water, although values closer to 100 nM are more commonly observed (Marino, et al., 1990, Howarth, et al., 1988, Collier, 1985). The concentration profile of molybdenum with depth shows, unlike many other algal nutrients, no systematic depletion of molybdenum in surface waters. In addition to this, although molybdenum is an important metal in various enzymes, there is no evidence that ambient molybdenum concentration in seawater actually limits any of this enzymatic activity or by extension, primary production (Collier, 1985).

Nickel (Ni)

Nickel is not affected by redox processes (Whitfield, 2001), and shows a typical nutrient like profile with depth; surface depletion relative to deep water concentrations (Bruland, 1980). Nickel is an important cofactor in the enzyme urease. Urea can be a source of nitrogen in cases where the first flush of nitrate assimilation has receded, and grazers have started releasing waste products, making the enzyme important for nitrogen assimilation (Harrison, et al., 1985). Nickel has also been shown to be growth limiting to phytoplankton cultures growing on urea (Price and Morel, 1991). Similar limitation situations have however not been reported from natural systems, most likely due to high background levels of nickel (Whitfield, 2001). Most types of the enzyme hydrogenase contains nickel and nickel ions are also present in some enzyme systems as porphyrin-type complexes

(Rayner-Canham and Overton, 2006). Natural concentrations of nickel in open ocean surface water have been reported by Collier and Edmond (1984) to be around 2 nM.

Copper (Cu)

Copper is the third most biologically important d-block metal (after iron and zinc). It is an important element in many proteins, several of them having parallel iron compounds. Although copper is very important in various biological functions, it can also be highly toxic in excess. (Rayner-Canham and Overton, 2006). Copper generally shows less of a nutrient like concentration profile with depth, and has even been found to show a profile that is almost linearly increasing with depth, although this increase is not at all as great as for other bioactive trace metals. The reason for copper not showing a nutrient like concentration profile might be the fact that copper is scavenged onto particles, removing a big part of the dissolved fraction from the seawater (Nolting, et al., 1991, Bruland, 1980). A study of the metal uptake in phytoplankton during a spring bloom in South San Fransisco Bay sowed that, although other metals (Cd, Zn, Ni) were depleted in surface waters during the bloom, this was not the case for copper. The dissolved copper concentration actually showed an increase of 20 % at the height of the bloom. The copper concentration increased also in particulate matter, but this appeared to be primarily influenced by resuspension. In conclusion, this study showed no real effect on phytoplankton uptake of copper during a high nutrient bloom (Luoma, et al., 1998). Different studies have shown copper concentrations in marine surface waters to vary between 0.4 and 5 nmol/L when not considering results obtained under polluted conditions (Stumm and Morgan, 1996, Collier and Edmond, 1984).

3.5.4 Toxicity of trace metals

Toxicity depends on the concentration of the accumulated metal in a metabolically available form. According to Rainbow (2002) toxicity occurs when the rate of metal uptake into an organism exceeds the combined rates of excretion and detoxification of metal in its metabolically available form. According to Walker et al. (2006) an organisms detoxification of metals consists of hiding active metal ions within a protein or depositing them in an insoluble form in intracellular granules for long-term storage or excretion.

Cadmium (Cd)

Cadmium can be toxic in the way all other reactive trace metals can be toxic; because of unspecific reactions with protein ligands. These kinds of reactions can for instance denature enzymes and render them inactive. More specific toxic effects also occur. An example is the blockage of physiological functions when Cd^{2+} substitutes for other metals, such as Ca^{2+} or Zn^{2+}. The fact that the ionic radius of Cd^{2+} and Ca^{2+} are very similar means that cadmium can interfere with calcium metabolism or even replace calcium in structural functions.

Copper (Cu)

Copper can be toxic as a free ion or as lipid-soluble copper complexes. Free copper ions are capable of inhibiting the enzyme catalase as well as reducing the cell’s defense against H_2O_2 and oxygen free radicals. Structurally, free copper ions can also be of great effect to the cell membrane, either disturbing cell permeability or the binding of other essential metals. Once inside the cell, copper may react with free thiols and –SH enzyme groups, which can cause disruption of the active sites of enzymes, as well as a suppression of mitosis. In addition to this, copper ions can act as a toxicant in subcellular organelles. Examples of this are interference of mitochondrial electron transport, respiration, ATP production and photosynthesis in the chloroplast. As lipid-soluble complexes, the copper can diffuse directly into the cell through the membrane. Once inside the copper and ligand can both exert toxicity independent of each other (Stauber and Florence, 1987).

3.5.5 Metal uptake by algae

As mentioned in section 3.5.2., phytoplankton function as suspended particles with ligands available for metal binding. This surface complex formation is the first, and most rapid, step of metal uptake in algal cells. The following step is slower and involves active transport through the cell membrane, assisted by specialized membrane proteins (Stumm and Morgan, 1996, Newman and McIntosh, 1991). The cell membrane is highly selective, and virtually impermeable to species of the wrong charge and polarity, which makes the aid of the membrane proteins necessary (Sunda and Huntsman, 1998). All though biological ligands are specific for certain metals, they are never entirely specific and will also bind to metals with similar ionic radii and coordination geometry to the intended nutrient metal. This is true for the metal binding sites on the transport proteins, as well as for various intracellular active sites (Sunda and Huntsman, 1998).

Studies have shown that nutrient enrichment can affect metal bioaccumulation in phytoplankton as well as invertebrates (Rijstenbil, et al., 1998, Muir, et al., 1998).

Luoma et al. (1998) described an increase of Cd concentration in marine phytoplankton during a period of spring phytoplankton bloom in South San Fransisco Bay (USA). In the study of this bloom the Cd concentration in phytoplankton increased by five times, while the dissolved Cd concentration decreased by two times (decreasing dissolved concentrations and increasing particulate concentrations were also found for nickel and zinc). Cd is a highly toxic metal to aquatic organisms, but Price and Morel (1990) has demonstrated that it can be a substitute for Zn in marine phytoplankton when Zn is depleted. Zn itself is essential for the biological requirements of phytoplankton, and Wang and Dei (2001) showed that the phytoplankton uptake of both Zn and Cd increased considerably in nutrient enriched conditions. The same study demonstrated that cell growth rate and metal uptake was correlated within the species examined, but did not conclude on whether or not the metal uptake rate is directly dependent on the cellular growth. If a situation arise, where the increase in metal uptake rate is greater than the increase in cell growth under nutrient enriched conditions the result may be an increase in cellular metal concentration. This in turn will increase the potential exposure to the metals by marine herbivores by the ingestion of food particles (Wang and Dei, 2001).

A study done by Wang et al. (2001) suggests that the cycling of Cd in marine planktonic food chains may be depressed under nitrogen-limited conditions. The same study showed how nitrogen enrichment leads to an increase in Cd uptake by phytoplankton and zooplankton. It has also been observed that the concentration of Cd generally decreases at higher trophic levels in classic planktonic food webs (Wang, 2002).

A study of the metal uptake in phytoplankton during a spring bloom in South San Fransisco Bay sowed that, although other metals (Cd, ,Zn, Ni) were depleted in surface waters during the bloom, this was not the case for copper. The dissolved copper concentration actually showed an increase of 20 % at the height of the bloom. The copper concentration increased also in particulate matter, but this appeared to be primarily influenced by resuspension. In conclusion, this study showed no real effect on phytoplankton uptake of copper during a high nutrient bloom (Luoma, et al., 1998).

3.5.6 Trophic transfer of trace elements

The word *trophic* refers to processes having to do with nutrition. Trophic transfer is thus a description of how nutrition is transferred within an ecosystem. The trophic levels start with the primary producers at the first levels. These autotrophs use energy from the sun to produce matter and energy that can be consumed by heterotrophic organisms on higher trophic levels. The second trophic level consists of herbivores that graze on the primary producing plants. On the third and higher level come the carnivores, that consume herbivores and other carnivores. The trophic relationships can be portrayed as food chains (simple chains from one level to the next), food webs (a network of interconnected and interdependent food chains) or as energy pyramids (compartmentalizing the organisms according to nutritional habits and the relative amount of energy contained at each trophic level). One general way of looking at oceanic food chains is phytoplankton – zooplankton – nekton (Pinet, 2011). A simple schematic of a trophic chain is shown in figure 3.11.

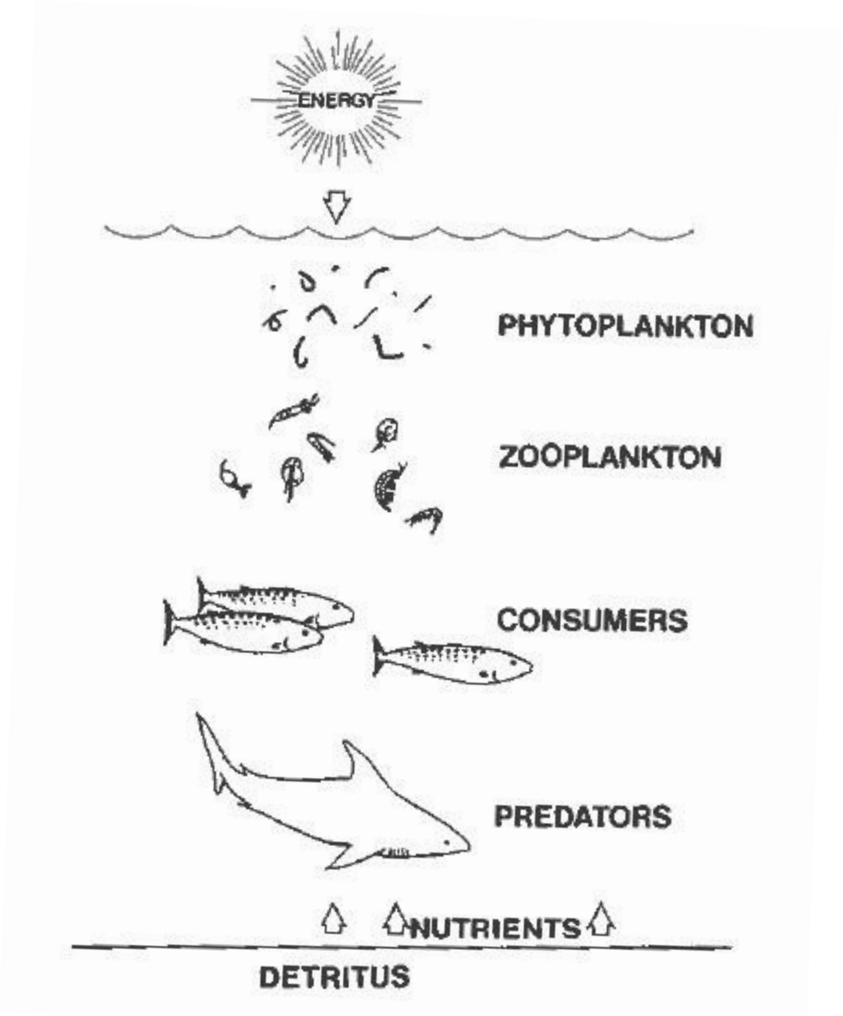


Figure 3.11: Schematic showing a typical aquatic food chain (Kennish, 2001).

Trophic transfer of metals is complex, and not always easily followed or explained. There are no rules of thumb regarding trace metals always being biomagnified along food chains, the concentration at each trophic level rather being determined by the metal accumulation pattern of the specific species at each trophic level (Rainbow, 2002)

A review article by Wang (2002) concludes that metal accumulation in marine animals is now considered to be controlled mainly by dietary exposure, and that few marine animals can accumulate metals to a high concentration only through uptake from the aqueous phase.

It has been suggested that a nitrogen stimulated eutrophication may, in addition to affecting the cycling of carbon, nitrogen and phosphorus, also result in changes in the cycling of toxic metals in marine food webs (Wang and Dei, 2001). The bioaccumulation of metals and metalloids can be a good indicator of the exposures of organisms in polluted ecosystems, although the link between bioaccumulation and toxicity is complex (Luoma and Rainbow, 2005).

4 Materials and methods

Different methods were used in this experiment, in order to look at different fractions of metal (e.g. chelex-labile and DGT-labile) and thus be able to get a broader picture.

The different techniques and methods used are presented separately with a theoretical background, before the experimental setup and descriptions of sampling and lab work is described.

4.1 DGT

The DGT (diffusive gradients in thin films) is a simply constructed device (figure 4.1), consisting of a layer of Chelex resin in a hydrogel, overlain by a diffusive hydrogel layer and a filter. These three layers are contained within a plastic molding and are thus protected somewhat from the environment.

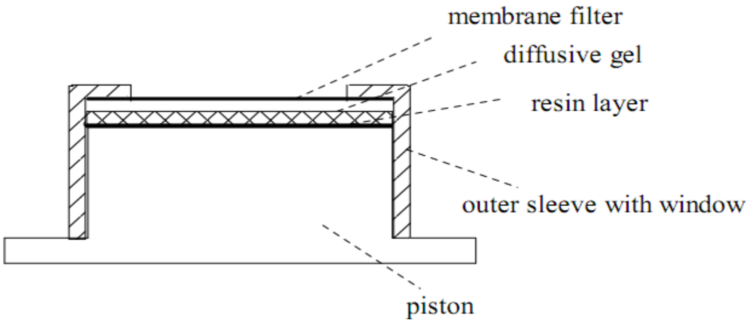


Figure 4.1: Schematic of a DGT (Zhang, 2003)

The Chelex resin is capable of accumulating metals, and it's the establishment of a constant concentration gradient in the diffusive layer that forms the basis for the measuring of metal concentrations. All labile metal species are able to bind to the Chelex resin and thus measurable by this technique. In short, this usually means all inorganic species and the labile organic species (Zhang, 2003).

DGT calculations

All calculations and equations were taken from the DGT manual found at the producer's website (Zhang, 2003).

Figure 3.2 shows a cross-section through a DGT device in contact with analyte solution. It depicts the steady-state concentration gradient that establishes as well as the diffusive layer and diffusion boundary layer (DBL). The figure shows the diffusive layer as a single layer of gel, but this also includes the membrane filter where this is used.

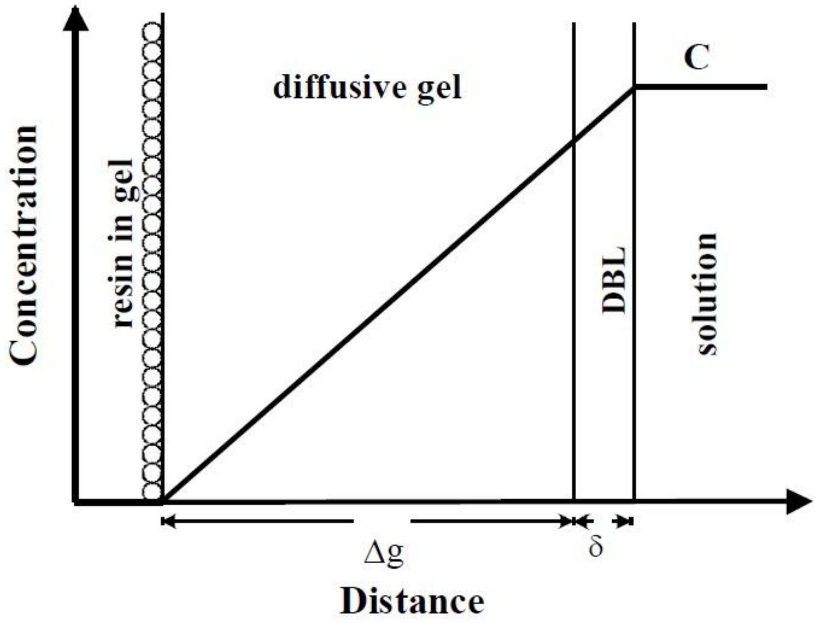


Figure 4.2: Schematic presentation of the DGT device in contact with analyte solution (Zhang, 2003)

The Chelex resin, i.e. the binding agent, is separated from the solution by the ion-permeable diffusive gel with a thickness Δg (0.093 cm). The diffusive boundary layer is located between this diffusive gel and the analyte solution. This DBL has a thickness of δ, and within this layer the only mode of transport is molecular diffusion. The linear steady-state concentration gradient establishes between the Chelex gel and the solution within a few minutes after immersion. This steady-state condition is what is used when applying the DGT technique for measuring concentrations in situ.

The flux, J (mol cm^{-2} s^{-1}), of any given ion through the gel is given by Fick's first law of diffusion (Eq. 1). D is the diffusion coefficient (cm^{-2} s^{-1}) and dC/dx (mol cm^{-4}) is the concentration gradient.

$$J = D\, dC/dx \qquad (1)$$

When assuming that diffusion coefficients of ions are the same in the diffusion gel as in water, the flux is given by Equation (2). C (mol cm^{-3}) is the bulk analyte-ion concentration and C' is the concentration at the boundary between the Chelex gel and the diffusive gel.

$$J = D (C - C') / (\Delta g + \delta) \qquad (2)$$

Assuming that the free metal ions are in rapid equilibrium with the Chelex, and having a large binding constant, C' is effectively zero (until saturation of the Chelex gel). By stirring the solution well, the boundary layer thickness δ can be considered negligible as it will be very small compared to the diffusive layer thickness Δg (~0,1 cm). This allows a simplification of Equation (2), giving Equation (3).

$$J = D C/\Delta g \qquad (3)$$

After deployment for a fixed time, t (s), the DGT is retrieved and the layer of Chelex-containing gel is peeled off. A known volume (5 mL in this work), V_e (mL) of nitric acid (1 or 2 M) is used to elute ions from the gel. The concentration of ions in the eluent, C_e (µg/L), can be measured by any suitable analytical technique. The elution process will retrieve only a fraction of the ions bound to the gel, and the concentration must be corrected for this by the elution factor, f_e. This value represents the ratio of eluted to bound metal ions. For Zn, Cd, Cu, Ni and Mn elution factors of 0,8 have been reported, using 1 or 2 M nitric acid. The amount of accumulated metals, M (µg) in the Chelex gel can be calculated using Equation (4), where the elution factor is taken into account. V_g (L) is the volume of Chelex gel (0.16 mL).

$$M = C_e (V_g + V_e) / f_e \qquad (4)$$

The M calculated from Equation (4) can be used to calculate the flux of ions though the known area A (3,14 cm^2) of the exposed diffusive layer (Eq. 5)

$$J = M / At \qquad (5)$$

Combining Equations (3) and (5) and then rearranging gives Equation (6). This equation can be used to calculate the concentration in the original analyte solution, given values of Δg, D, A, t and M are known.

$$C = M\Delta g / DtA \tag{6}$$

D values for 10ºC given in table 4.1 are the ones used in this work.

Table 4.1: Diffusion coeffisient values for 10ºC. No specific coefficient was found for molybdenum, and so the coefficient for chromium was used (Zang 2003)

Metal	D [cm-2 s-1]
Cd	3,90E-06
Mo (Cr)	3,23E-06
Ni	3,70E-06
Cu	3,99E-06

4.2 Chelex-100

Chelex 100 was used as a complexing agent in the DGT resin gel as well as being added directly to the seawater samples. This resin is a styrene divinylbenzene copolymer, containing paired iminodiacetate ions. These iminodiacetate ions act as chelating groups in binding polyvalent metal ions and are effectively the factor determining the selectivity of the resin. The structure is shown in figure 3.2.

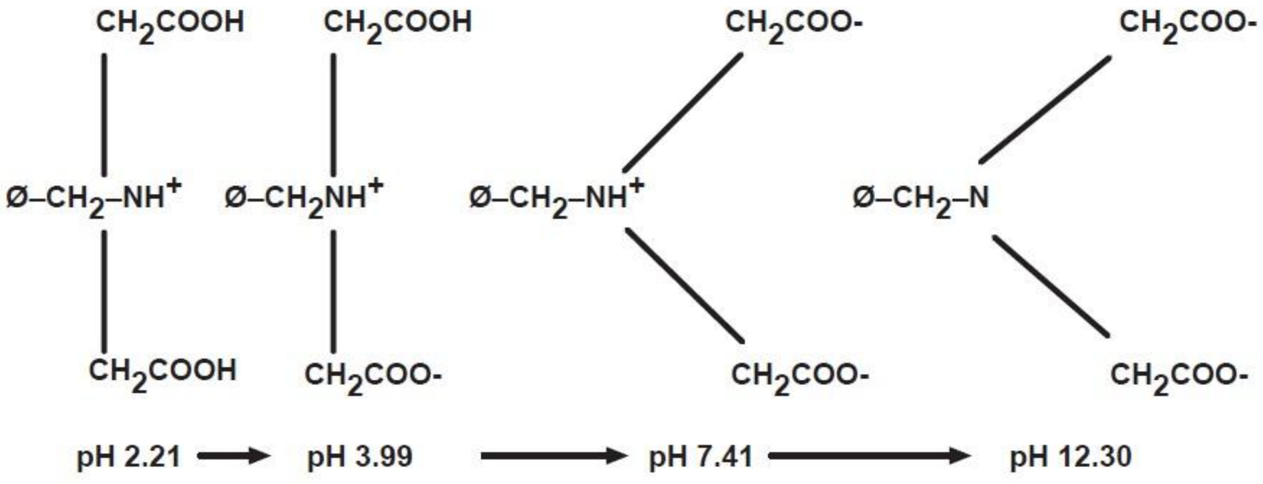


Figure 4.3: Chelex structure at different pH (Bio-Rad-Laboratories, 2000)

The selectivity of polyvalent over monovalent ions is approx. 5,000 to 1, and which means a very high affinity for trace metals over other ions that might be present in the samples in high concentrations, such as sodium and potassium (Bio-Rad-Laboratories, 2000).

FIGURE showing structure

4.3 ICP-MS

ICP-MS is a powerful technique for analysis and quantification of trace elements, offering high precision and low interferences. It combines a high-temperature ICP (Inductively Coupled Plasma) source with a mass spectrometer. The ICP source converts the atoms of the elements in the sample to ions. These ions are then separated and detected by the mass spectrometer. The sample is typically introduced into the ICP plasma as an aerosol, either by aspirating a liquid or dissolved solid sample into a nebulizer or using a laser to directly convert solid samples into an aerosol. Once the sample aerosol is introduced into the ICP torch, it is completely desolvated and the elements in the aerosol are converted first into gaseous atoms and then ionized towards the end of the plasma. Once the elements in the sample are converted into ions, they are then brought into the mass spectrometer via the interface cones. The interface region in the ICP-MS transmits the ions traveling in the argon sample stream at atmospheric pressure into the low pressure region of the mass spectrometer. This is done through the intermediate vacuum region created by the two interface cones, the sampler and the skimmer. The sampler and skimmer cones are metal disks with a small hole (~1mm) in the center. The purpose of these cones is to sample the center portion of the ion beam coming from the ICP torch (Taylor, 2001, Thomas, 2004, Thomas, 2001b). Once the ions enter the mass spectrometer, they are separated by their mass-to-charge ratio. In a High Resolution mass spectrometer, both a magnetic sector and an electric sector are used to separate and focus the ions. The magnetic sector is dispersive with respect to both ion energy and mass and focuses all the ions with diverging angles of motion coming from the entrance slit of the spectrometer. The electric sector is dispersive only to ion energy and focuses the ions onto the exit slit (Hoffmann and Stroobant, 2007, Thomas, 2001a)

4.4 Filtration

Size fractionation can be done either by independent simple filtration, or by performing a sequential filtration. The first method uses different samples of water of the same volume, which are filtered through filters of the appropriate pore sizes; one sample per pore size. Assuming that all filters retain all particles bigger than the pore size, and lets all smaller particles through, the values obtained (e.g. trace metal concentrations or POC) in each filter can be subtracted from the previous, (bigger pore) filter size to obtain the specific amount present in each size fraction. The second method uses a sequential filtration through a system of filters, from the biggest to the smallest pore size filter. The same water sample is used for the entire filtration process, all though volumes can vary for the different pore sizes. Bigger pore size filters can for example be used for bigger volumes and at greater speed than smaller ones without getting clogged. The sequential filtering also reduces the number of samples needed for the size fractionation.

The division into size classes is not a uniform concept, and thus varies between different studies. Size classes used in this experiment and the plankton type corresponding to the size are found in table 4.2.

Table 4.2: Plankton size classes

Size [µm]	**Plankton type**
0.2-2	Picoplankton
2-10	Nanoplankton
10-20	Larger nanoplankton
20-140	Microplankton
> 140	Mesozooplankton

4.5 Statistics

4.5.1 ANOVA with Tukey's test

The parametric analysis of variance (ANOVA) determines how much of the variation in the dependent variable scores is caused by differences between the scores obtained in the experimental conditions, and then comparing these to the error term, which is dependent on variation in the dependent variable scores within each of the experimental conditions (Rutherford, 2011, Zar, 1999). In this work the single-factor (or one-way) ANOVA was used to determine significant differences of the concentrations of trace elements (Cd, Mo, Ni, Cu) under five different ammonia concentrations. This was performed using a randomized balance design (factor 1: 5 ammonia levels). The dependent variable (trace metal) was transformed using the log function to fit statistical requirements of the parametric ANOVA (homogeneity of variance). A $p < 0.05$ value was used to detect significant differences between trace metal concentrations in the different nutrient concentration treatments.

Tukey's test, or the Tukey–Kramer method, is a single-step multiple comparison procedure and statistical test. Two assumptions are made using the Tukey’s test; 1. The observations to be tested are independent, and 2. The variation across observations is equal/homoscedastic (NIST/SEMATECH, 2012b). In this work the Tukey’s test was used in conjunction with a one-way ANOVA, to find which of the treatments compared were significantly different from one another.

The one-way ANOVA with a following Tukey’s test was performed using Microsoft Excel 2010 and the Microsoft Excel statistical add-in XLSTAT-Pro.

4.5.2 Linear least squares regression

Linear least squares regression, or simple regression, is a least squares estimator of a linear regression model with a single explanatory variable. This means fitting a straight line through a set of *n* points, in a way that ensures that the sum of the squared residuals of the model are as small as possible (NIST/SEMATECH, 2012a, Rutherford, 2011).

The linear regression was performed to examine the relative importance of ammonia on the dynamics of the trace metal concentrations. This analysis was done for the very last sampling days of the experiment, to see what the final result of daily additions of nutrients over time would be in respect to metal concentration.

The one-way linear least squares regression was performed using Microsoft Excel 2010 and the Microsoft Excel statistical add-in XLSTAT-Pro.

4.6 Experimental

The experiment was carried out in the Comau Fjord, and different aspects of the study area has been presented in section 3.1.

4.6.1 Experimental design

Mesocosms

Mesocosms have been defined as “experimental systems that simulate real-life conditions as closely as possible, whilst allowing the manipulation of environmental factors” (Joint, 2006). Further, a pelagic mesocosm is an enclosure with a volume ranging from 1 to 1000 m^3. The advantage of a mesocosm study over standard laboratory tests is that it maintains a natural community under close to natural, self-sustaining conditions. At the same time the advantage of having reliable reference conditions and replication is not lost, thus providing a link between the small scale laboratory experiments and natural scale field surveys. This results in the mesocosm approach often being considered the experimental ecosystem closest to the real world (Riebesell, et al., 2010).

Riebesell, et al. (2010) categorizes an experiment consisting of multiple mesocosm units, with a volume of 1 to 10 m^3 and a duration of days to weeks as a category I-II, which is to say right on the border between micro- and mesocosm, giving good controllability, fairly easy replication, good homogeneity and relatively low unit cost.

Our experiment was carried out using 10 plastic tanks of 1 m^3 inserted into separate metal cages. Out of these, five were filled with surface water (3 m depth) and five were filled with deeper water (10 m depth) from the fjord. The reason for this is as explained in section 3.1, the low salinity layer at the topmost 5-10 m of the fjord, which is responsible for occurrence of very different microbial communities above and below 5-10 m depth. The water was pumped into a 33 L plastic tank using a peristaltic pump and a plastic hose (diameter 35 mm), suspended 30 m offshore. The flowing water was then continuously pumped through the collector tank and divided equally to each of the five tanks. No screening was done of the incoming water, keeping the mesocosms as natural as possible in order to contain different taxonomic groups at various trophic levels. Some aspects of the sampling and experimental work with the mesocosms are shown in figure 4.4.

Each tank represents one treatment, without replicates. The tanks were suspended in the water using buoys to keep them afloat, and letting the wave action move the tanks and the contents continually. The sampling was done between January 23 and February 14 2011.

Figure 4.4: Various aspects of mesocosm setup and sampling

Nutrient additions

Macronutrients (nitrogen, phosphorus and silicon) were added every third day, so as to fulfill the simulation of nutrient enrichment caused by waste from salmon aquaculture. Five different treatments were designed, providing a range of nutrient concentrations and ratios to the experiment. The concentrations and ratios are given in table 4.3.

Nitrogen was supplied in the form of ammonium chloride (NH_4Cl), phosphorus in the form of sodium dihydrogen phosphate monohydrate ($NaH_2PO_4 \cdot H_2O$) and silicon in the form of sodium metasilicate enneahydrate (Na2SiO3·9H2O). Nitrogen and phosphorus were both supplied in forms corresponding to waste from aquaculture, while silicon was supplied to avoid potential nutrient limiting.

Table 4.3: Rate of supply [µmol.m^{-3}. d^{-1}] and ratio for the different macronutrients added. NH_4Cl for Nitrogen (N), $NaH_2PO4·H_2O$ for Phosphorus (P) and $Na_2SiO_3·9H_2O$ for Silicon (Si) in the different treatments for deeper (1-5) and surface water (6-10) mesocosms, in the Comau fjord during January and February 2011. The control treatments were supplied no nutrient addition representing the base line.

Treatment	Mesocosm Deeper / Surface	N	P	Si	N:P	N:Si
Control	1 / 6					
Natural	2 / 7	296.0	19.4	146.8	15.3	2
Conc. 1	3 / 8	1199.7	49.7	594.7	24.2	2
Conc. 2	4 / 9	2991.3	123.8	1483.0	24.2	2
Conc. 3	5 / 10	4674.0	193.5	2317.2	24.2	2

Sampling

Water samples were collected every third day from each of the tanks. Samples were taken for four different methods of trace metal analysis; direct sampling (acidified water for ICP-MS analysis), Chelex-100, DGT and total filtration/size fractionation filtration. Analysis of seawater reference materials to assess method accuracy has previously been carried out within the working group, as well as a part of the WAFOW project. Details on accuracy and precision for the methods used can be found in a previous publication (Ardelan, et al., 2009).

Because of time restraints and capacity it was not possible to carry out sampling for all techniques at every sampling day. The scheme for sampling is shown in table 4.3. The time restraints and capacity problems are also the reason for parallel sampling only being done for the DGT's, as these demand very little extra work per sample. The choice to sample continually (instead of doing fewer samples but with parallels) was also due to the wish to pick up any sudden changes in trace element concentration throughout the experiment, that is – to get a more complete picture of fluctuations with time.

Samples for dissolved matter were done throughout the experiment for the direct samples as well as for the Chelex-100. For the DGT's filtration was only done at the very start of the experiment. These samples were collected by filtering through an acid washed Sartorius Sartobran 300 sterile capsule filter with pore sizes 0.45 and 0.2 µm (sequential). Sample processing at Huinay Field Station were done in a closed room, in a Class-100 laminar flow hood (Air Clean Systems 400 Workstation) to avoid contamination and to keep the air as clean as possible. After preparation in the field lab, the samples were carefully packed, shipped to Trondheim and processed further at a Class-100 clean lab at the chemistry department.

Table 4.3: Sampling scheme for the mesocosm experiment in the Comau Fjord during January and February 2011

Date	Sampling day	System	Technique
23.01.2011	1	Deeper	Chelex - DGT – Filtration > 0.2µm - Direct
24.01.2011		Surface	
26.01.2011	2	Deeper	Chelex - DGT - Filtration > 0.2µm - Direct
27.01.2011		Surface	
29.01.2011	3	Deeper	Chelex - DGT - Size Fractionation - Direct
30.01.2011		Surface	
01.02.2011	4	Deeper	Filtration > 0.2µm - Direct
02.02.2011		Surface	
04.02.2011	5	Deeper	Chelex - DGT - Size Fraction - Direct
05.02.2011		Surface	
07.02.2011	6	Deeper	Filtration > 0.2µm - Direct
08.02.2011		Surface	
10.02.2011	7	Deeper	Filtration > 0.2µm - Direct
11.02.2011		Surface	
13.02.2011	8	Deeper	Chelex - DGT - Size Fractionation - Direct
14.02.2011		Surface	

Parallel to the sampling for trace metal analysis, collection of samples for chemical (nutrient concentrations, POC, PON and pH) and biological (Chl-a, phytoplankton, zooplankton bacterioplankton) parameters were done as part of the WAFOW project.

The HR-ICP-MS analysis was carried out by Syverin Lierhagen, on a Thermo Finnigan Element 2 (Details on the instrument is found in Appendix A)

4.6.2 Direct sampling

Samples for direct HR-ICP-MS analysis were taken out of the bulk. For every tank there was taken one total sample and one dissolved, filtrated through the 0.2 µm Sartorius filter using a syringe. Approximately 10 mL of each sample was transferred to its own test tube, and acidified with ~1M nitric acid (HNO_3). In the clean lab the sample was diluted ten times by adding MilliQ water (9 mL) to a portion of the original sample (1 mL), and then acidified by adding ultra-pure HNO_3 (2 drops, concentrated).

4.6.3 DGT sampling

Samples for DGT's were taken out of the bulk. For every tank a water sample of 1,5-2 L was transferred to an acid washed sealable plastic box and added 3 DGT's. The box was then placed inside a plastic bag to ensure a clean environment and left on the shaker (65-80 RPM) for a recorded amount of days (approximately three days). The DGT's were after shaking transferred to individual plastic bags, and frozen until further preparation.

In the clean lab the DGT's were opened on a teflon sheet, and the filter and empty gel was removed. The third layer, consisting of the resin gel containing metals, was transferred to an acid washed polyethylene test tube. ultra-pure HNO_3 (1 mL, 3M) was added to the test tube, and the sample was left for 12 hours in a shaker (65-80 RPM). Next the acid was transferred to another acid cleaned polyethylene test tube, leaving the gel holding the resin in the first tube. The tube holding the gel was then added ultra-pure HNO_3 (4 mL, 0.25M) in portions of 1 mL and 3mL. The liquid was transferred after each portion to the second tube, so as to clean out as much as possible of the metal from the gel.

4.6.4 Chelex-100 sampling

Samples for chelex were taken out of the bulk. For every tank there was taken one particulate sample and one filtrated through the 0.2 µm Sartorius filter using a syringe. ~150 g of water sample was transferred to a previously cleaned plastic bottle. The exact weight was recorded. The Chelex-100 slurry (containing an ammonium acetate buffer, $C_2H_4O_2.NH_3$) was first shaken to achieve a more homogenous solution, before 0.8 mL was transferred to the sample using an automatic pipette. The sample containing Chelex-100 slurry was placed on the shaker (65-80 RPM) for at least 3 days each bottle placed in a plastic bag to ensure a clean environment. Precise date and time for shake start and stop was recorded.

When the sample had been on the shaker for at least 3 days it was transferred to an acid washed Poly-Prep chromatographic column (Bio-Rad Laboratories). The sample was washed through the column, and the Chelex-100 containing metals retained by the filter. The Chelex-100 was then first washed with MilliQ water and secondly with $C_2H_4O_2.NH_3$ (~10 mL, 0.1M) to remove any residue of seawater matrix. The Chelex was then washed again with MilliQ water. The column was lastly sealed for storage (at 4ºC) and transport.

In the clean lab ultra-pure HNO_3 (1 mL, 2M) was added to the samples and they were left (with a cap on top and a stopper at the opening of the columns) for 5 minutes before the column was shaken gently and left for another 15 minutes. The cap and stopper was removed from the column, and the acid was allowed to flow through into an acid washed polyethylene test tube. The column was recapped, added ultra-pure HNO_3 (4 mL, 0,25M) and left for 10 minutes. The cap and stopper was removed, and the acid was allowed to flow through to the test tube.

4.6.5 Filtration

Total filtration

The total filtration was done done using a simple filtration system (Hellman series) connected to a peristaltic pump (Multifix type M80). The filter used was a 0.2 µm acid washed polycarbonate filter with a 54 mm diameter.

Size fractionation filtration

Filtration of the 0.2 µm, 2 µm and 10 µm fractions was done using a simple filtration system (Hellman series) connected to a peristaltic pump (Multifix type M80). The filters used were acid washed polycarbonate filters of 25 and 45 mm diameter. The filtration of the 20 µm and 140 µm fractions were done with acid washed plastic sieves attached to Nitex mesh of the correct pore size. The retained material was washed onto 0.2 µm acid washed polycarbonate filters. Filtration volumes were recorded, and ranged from ≥ 2000 mL for the bigger fractions, to 100 mL for the smallest ones. The samples were frozen for storage and transport to Trondheim.

At the clean lab in NTNU, the samples of both total and size fractionation filtration were defrosted and prepared for digestion in a laboratory microwave reactor (Ultra Clave, MLS/Milestone). The filters were transferred to Teflon tubes, and ultra-pure HNO_3 (5 mL, 50 w%) was added. A rack containing samples as well as instrument blanks were placed in the ultra clave instrument, and the pre-designed two hour digestion process was started. After completion of the digestion process, the samples were diluted further. This was done by pouring the content of the Teflon tube into an acid washed dilution bottle, and then filling this to 61 ± 0.3 mg. 5 mL samples were then transferred to acid washed polyethylene tubes for analysis by HR-ICP-MS. The density of ultra-pure water used for dilution was assumed to be 0.99999 g/mL, and this was used to recalculate the volume of the sample, which could then be divided by the total original volume filtered to obtain final concentration from values given by HR-ICP-MS analysis.

5 Results

Results are presented in the unit nM (nmol/L). The SI coherent derived unit for volume is m^3, and thus the unit for (amount) concentration is mol/m^3 (2006). This means a conversion from L to m^3 is needed to present the values in SI units. Because of the convention of presenting concentrations in mol/L however, it was chosen not to do this conversion in this thesis. The reason for this is to make comparisons between the thesis results and literature values more straight forward.

In the results where parallels were available, clear outliers were removed before presenting results of graphs and doing statistical analysis. This was done to reduce the impact of sample contamination on the result presentation.

Where parallels are available, standard deviations are presented separately in tables instead of as error bars within the graph. This is done to make graphs more readable when several results are presented in one single graph. To maintain a similar method of presentation throughout the thesis, all results with parallels are presented in this way. Tables containing statistical information are presented in appendix B, including a summary table of all of the ANOVA's done (appendix table B32). Complete results sheets are included in appendix C.

5.1 Blanks and detection limits

The results from all analyses of blanks with different methods are presented in table 5.1. Mean values were used when calculating metal concentration in samples.

The detection limit is part of the quality control of an analytical method. It is defined as the lowest concentration statistically different from the blank value used (Grasshoff, et al., 2007).

Detection limits were calculated by multiplying the standard deviations obtained from blank measurements by three. The values are shown in table 5.2. Some values obtained in analysis of samples were below the detection limit, and these are presented as zero-values in graphs and omitted in statistical analysis.

Table 5.1: Blank values [nM] attained from ICP-MS analysis for all sampling techniques used. Filter: Filter pore size. RSD: Relative standard deviation (%). Std: standard deviation.

	Technique	Direct	Chelex	DGT	Size Fraction	
	Blank Replicate	nM	nM	nM	nM	Filter
Cd	**1**	0,027	0,177	0,015	0,004	0.8
	2	0,019	0,063	0,013	0,006	0.8
	3	0,021	0,190	0,013	0,007	0.8
	4	0,057	0,075	0,006	0,007	2
	5	0,013	0,120	0,008	0,003	2
	6	0,012		0,010	0,004	2
	7			0,006	0,013	10
	8			0,011	0,029	10
	9				0,005	10
	Average	0,025	0,125	0,010	0,009	
	Std	0,015	0,052	0,003	0,008	
	RSD % <5, 5-10, >10	61,4	41,3	31,3	88,3	
Mo	**1**	0,270	0,324	0,152	0,053	0.8
	2	0,223	0,118	0,046	0,038	0.8
	3	0,165	0,560	0,132	0,019	0.8
	4	1,272	0,452	0,162	0,022	2
	5	0,252	0,628	0,341	0,044	2
	6	0,107		0,145	0,033	2
	7			0,126	0,045	10
	8			0,153	0,074	10
	9				0,062	10
	Average	0,38	0,42	0,16	0,04	
	Std	0,40	0,18	0,08	0,02	
	RSD % <5, 5-10, >10	105,4	43,5	49,2	39,0	
Ni	**1**	17,01	3,68	48,59	0,536	0.8
	2	20,44	2,35	125,73	0,372	0.8
	3	14,93	6,90	127,86	0,469	0.8
	4	25,75	5,10	68,77	0,878	2
	5	15,69	6,99	69,83	1,042	2
	6	16,29		77,22	1,244	2
	7			64,92	0,886	10
	8			67,23	1,282	10
	9				0,782	10
	Average	18,35	5,00	81,27	0,83	
	Std	3,74	1,81	27,35	0,31	
	RSD % <5, 5-10, >10	20,4	36,1	33,7	37,0	
Cu	**1**	2,07	8,48	2,46	0,441	0.8
	2	0,94	4,86	3,26	0,305	0.8
	3	1,19	23,04	2,77	0,378	0.8
	4	1,63	12,03	2,42	0,388	2
	5	0,77	21,12	2,36	0,510	2
	6	0,50		2,91	0,372	2
	7			1,75	0,414	10
	8			1,95	1,407	10
	9				0,513	10
	Average	1,18	13,91	2,48	0,53	
	Std	0,53	7,08	0,46	0,32	
	RSD % <5, 5-10, >10	44,8	50,9	18,6	60,5	

Table 5.2: Detection limits [nM] for measurements using different techniques.
***Chelex-100 technique using 150 mL gives a 30xupconcentration factor.**
**** Size fraction detection limits depend on volume used in filtration**

	Direct	Chelex*	DGT	Size Fraction (200 mL / 2000 mL sample)**	
	nM	nM	nM	nM	
Cd	0,071	0,002	0,071	0,002	0,0002
Mo	1,59	0,053	1,59	0,040	0,004
Ni	29,57	0,99	29,57	0,74	0,074
Cu	2,78	0,093	2,78	0,07	0,007

5.2 River samples

The river samples were taken at three different locations in the river; up-river (0 Practical Salinity Unit - PSU), close to outlet (5 PSU) and in the river-fjord transition (7 PSU). Sampling was done for both Chelex-100 and DGT processing. The results from these analyses are shown in figure 5.1. Means and standard deviations are presented in appendix table B1.

There is a clear decreasing cadmium concentration from up-river to the river-fjord transition when considering the chelex samples, but quite the opposite is true when looking at the DGT results.

For molybdenum, unfortunately the chelex samples gave results below the detection limit, and thus could not be used. For the DGT's there is a decrease from upriver to outlet, and then an increase as the river mixes with the fjord.

For nickel, the concentration values are quite similar for the three stations and between the two methods used, except for a rather large increase in DGT-labile concentration at the outlet point of the river.

For copper there is an increase in DGT-labile concentration from up-river to the river-fjord transition, while the chelex-labile concentration drops from the up-river to the outlet point, before increasing at the river-fjord transition.

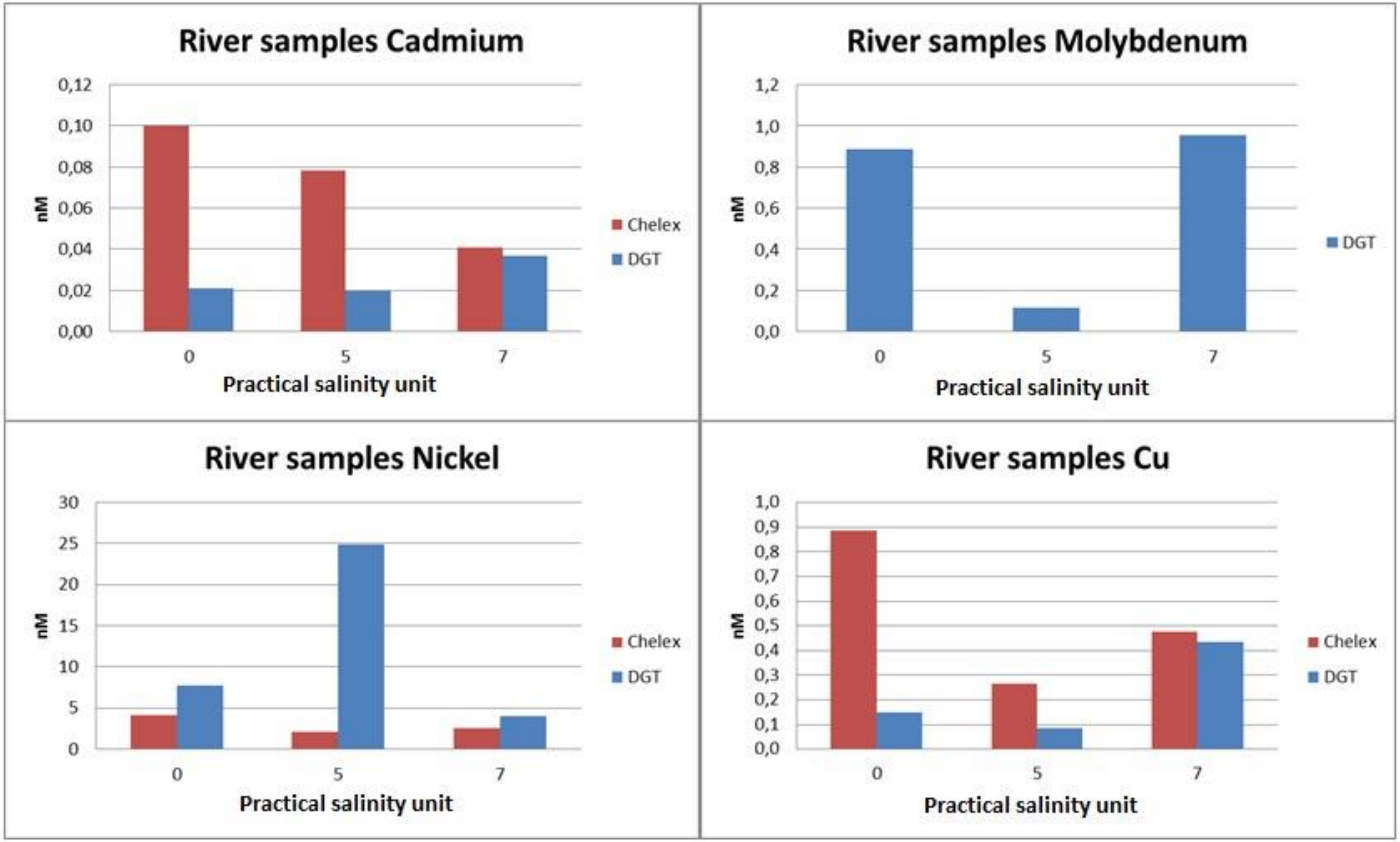


Figure 5.1: River samples; chelex labile and DGT labile fractions of cadmium, molybdenum, nickel and copper

5.3 Depth profiles

Analysis of the different metal concentrations were done for a selection of depths in the fjord. The results are presented in figure 5.2. Means and standard deviations are presented in appendix table B2.

Cadmium

Cadmium shows surface depletion and an increasing concentration with depth in both chelex-labile and DGT-labile concentration.

Molybdenum

The chelex-labile molybdenum concentration shows some fluctuations, as it increases from the surface down to 4 m depth and then decreases again down to 10 m. From there it increases quite a lot down to 30 m, where it fluctuates less down to 50 and 70 m. The DGT-labile molybdenum concentration changes very little from the surface down to 70 m depth, giving an almost linear concentration profile.

Nickel

Both the chelex-labile and the DGT-labile nickel concentration show a slight depletion at the surface, and some increase in concentration with depth.

Copper

The DGT-labile copper concentration changes little with depth, while the chelex-labile concentration shows more of a surface depletion with increasing concentration down to 50 m.

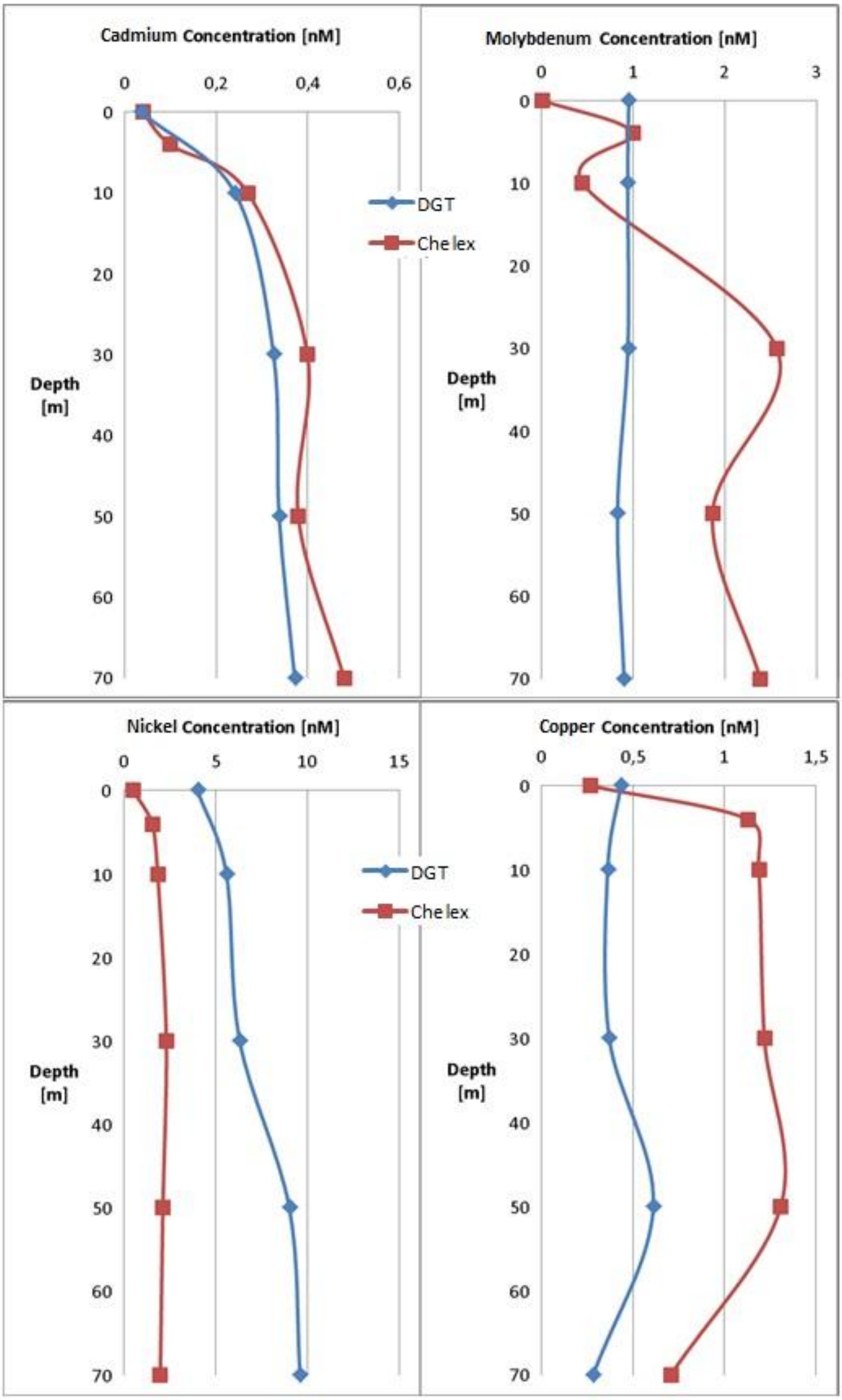


Figure 5.2: Depth profiles; DGT labile and chelex labile fractions of cadmium, molybdenum, nickel and copper

5.4 Particulate organic carbon and dissolved organic material

Measurements of particulate organic carbon were also done as a part of the WAFOW. The results of these measurements are given in figure 5.3. These results show that treatments with no or natural nutrient additions did not experience a quickly growing bloom of organic carbon, while the opposite is true for the three treatments where high concentrations of nutrients were added. It can also be pointed out that the high-nutrient treatments reach almost the same value of maximum biomass, with only the conc. 1 treatment being slightly lower than the two highest addition treatments. All treatments in both surface and deeper water peak at the middle of the experiment, at which point the content of POC declines.

Analysis of dissolved organic material (DOM) was also done, and some preliminary results show that ammonium discharge has produced significant changes in the molecular structure of the DOM, as was expected. Production of DOM molecules containing N and S increased significantly from 7 and 3 % in the initial waters, to 47.4 and 15.5 % respectively in the treatment with the highest ammonium flux (Unpublished data; Ardelan, et al., 2012).

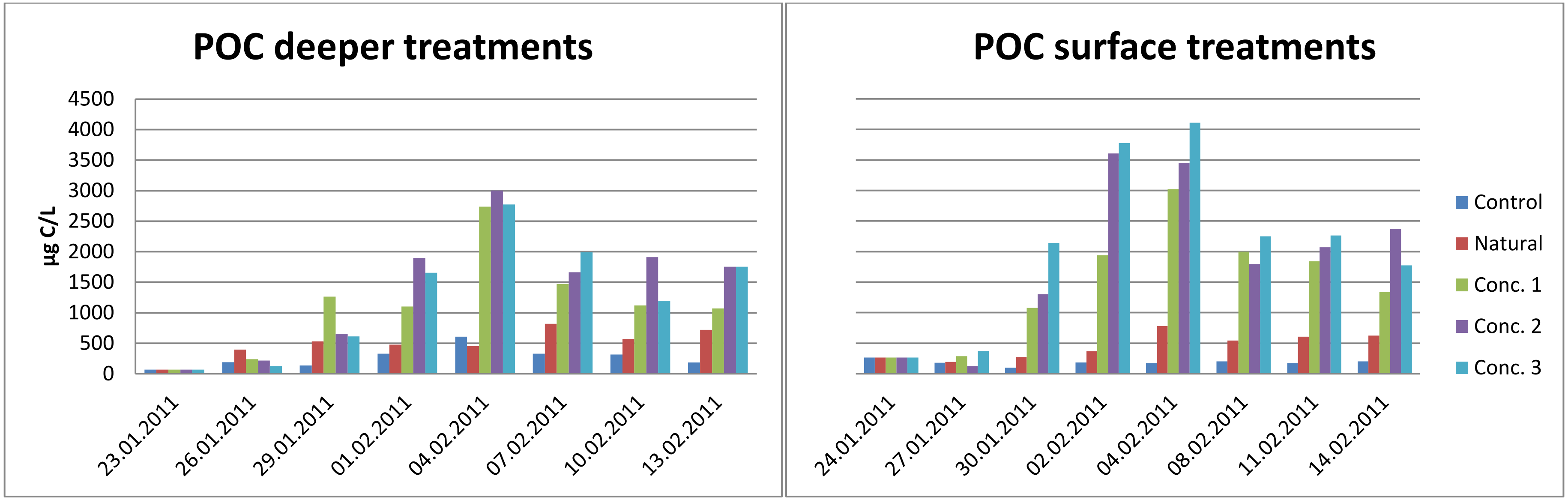


Figure 5.3: Particulate organic carbon in deeper and surface water

5.5 Cadmium

5.5.1 Chelex

There is some fluctuation in the chelex-cadmium concentrations in both the surface and the deeper water, with no clear upward or downward trend. However, at the very end of the experiment it becomes clear that the control and natural treatments have higher concentrations of chelex-labile cadmium than the three high ammonium treatments. These results are presented in figure 5.4.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. A negative correlation was found for the deeper cadmium concentration, and almost no correlation could be found for the surface. The relationship was found to be significant only for the deeper chelex-labile cadmium concentration, not for the surface. The R^2 value shows that 55.8% of the total regression is explained by the regression of NH_4^+ and Cd. A summary of the linear regression is given in table appendix table B3.

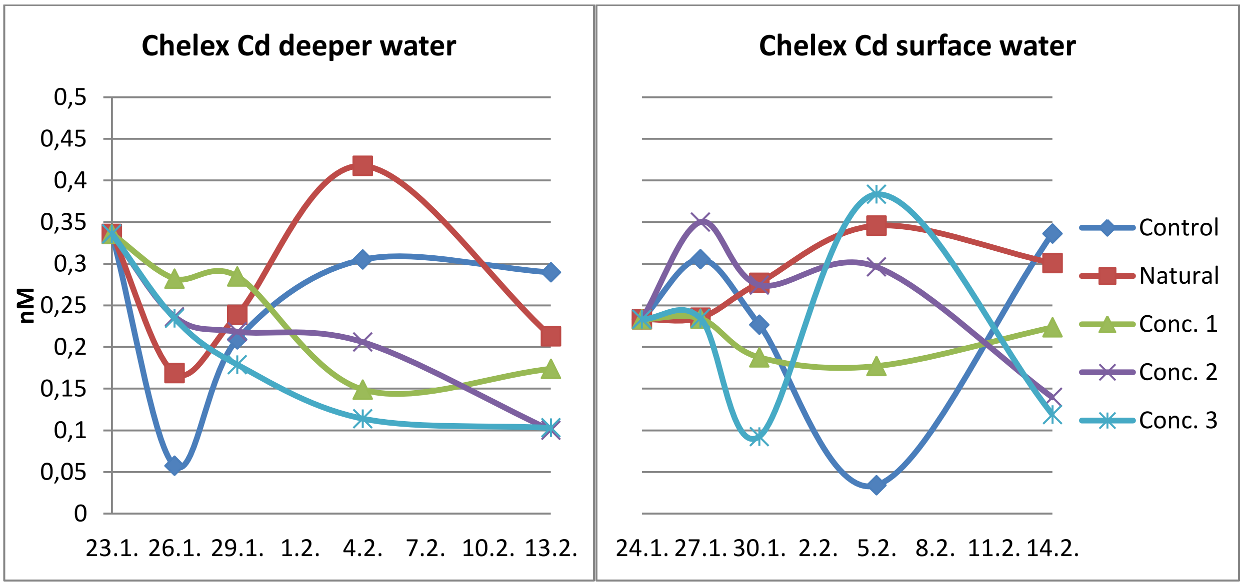


Figure 5.4: Chelex labile cadmium in deeper and surface water

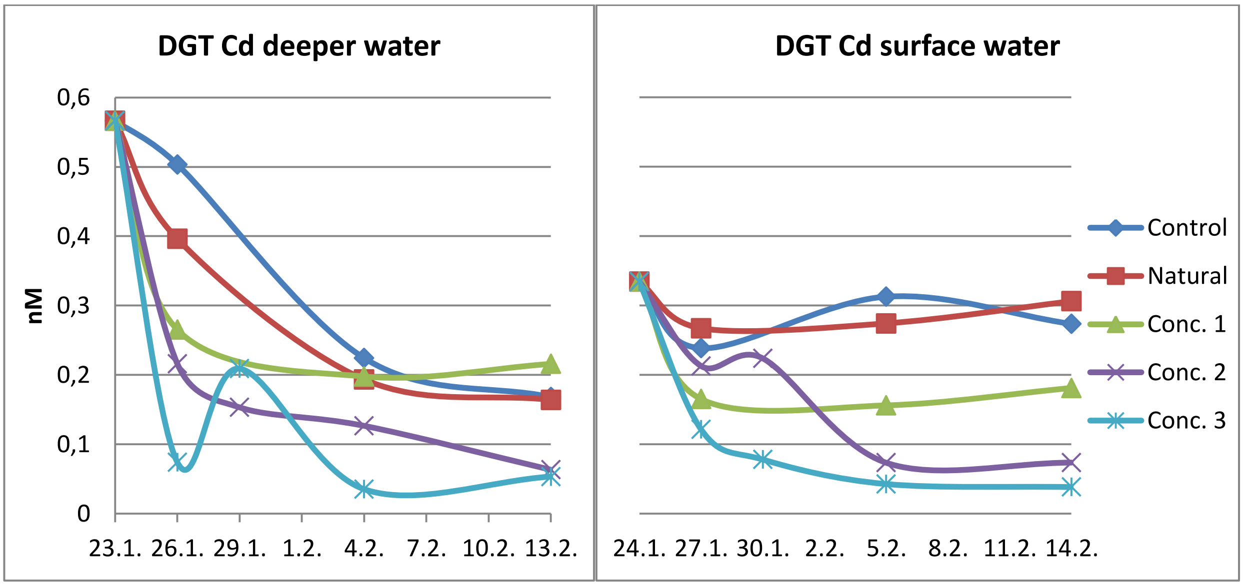


Figure 5.5: DGT labile cadmium in deeper and surface water

5.5.2 DGT

All treatments in the deeper water show a clear downward trend from the start to the end of the experiment (figure 5.5, means and standard deviations in appendix table B4). At the end of the experiment, the two treatments with a higher ammonium flux also have the lowest concentration of DGT-labile cadmium. In the surface water there is less of a decrease in concentration from start to end, but at the end there is again a difference between low ammonium treatments and high ammonium treatments.

A one-way ANOVA was done for the last sampling day, to test whether the treatments showed significant differences at the very end of the experiment. This analysis showed significant differences between the treatments, both in the deeper and the surface water. A Tukey's test was performed, and the treatments showing significant differences are presented in appendix table B5. For both the deeper and the surface water samples, the only treatments *not* showing any significant differences are the control vs. the natural nutrient concentration, and the second highest vs. highest nutrient concentrations.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. The relationship was found to be significant for both deeper and surface cadmium concentrations, both showing a negative correlation. The R^2 values show that 85.3% of the total regression is explained by the regression of NH_4^+ and Cd for the deeper samples, while 90.5% of the total regression is explained by the regression of NH_4^+ and Cd for the surface samples. A summary of the linear regression is given appendix table B6.

5.5.3 Biogenic particulate form (> 0.2 µm)

In the deeper water there seems to be a higher content of Cd in the treatment containing the lowest nutrient concentration above natural throughout most of the experiment (figure 5.6). The treatments containing the second highest and highest nutrient concentrations also have quite high Cd concentrations compared to the control and natural, from the second sampling day and throughout the rest of the experiment.

In the surface water the treatments containing the two highest nutrient concentrations are the dominating ones throughout most of the experiment, while the concentration in the treatment containing the lowest nutrient concentration above natural stays somewhat closer to the concentrations in the control and natural treatments.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for the deeper water filtration samples, but not for the surface. A Tukey's test was performed on the deeper water samples, and the treatments showing significant differences are presented in appendix table B7. The only treatments showing significant differences were the control vs. the conc. 1 treatment, and the natural vs. the conc. 1 treatment.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water cadmium concentration showed a positive correlation, but the relationship was only found to be significant for the surface. The R^2 value shows that 44.1% of the total regression is explained by the regression of NH_4^+ and Cd. A summary of the linear regression is given in appendix table B8.

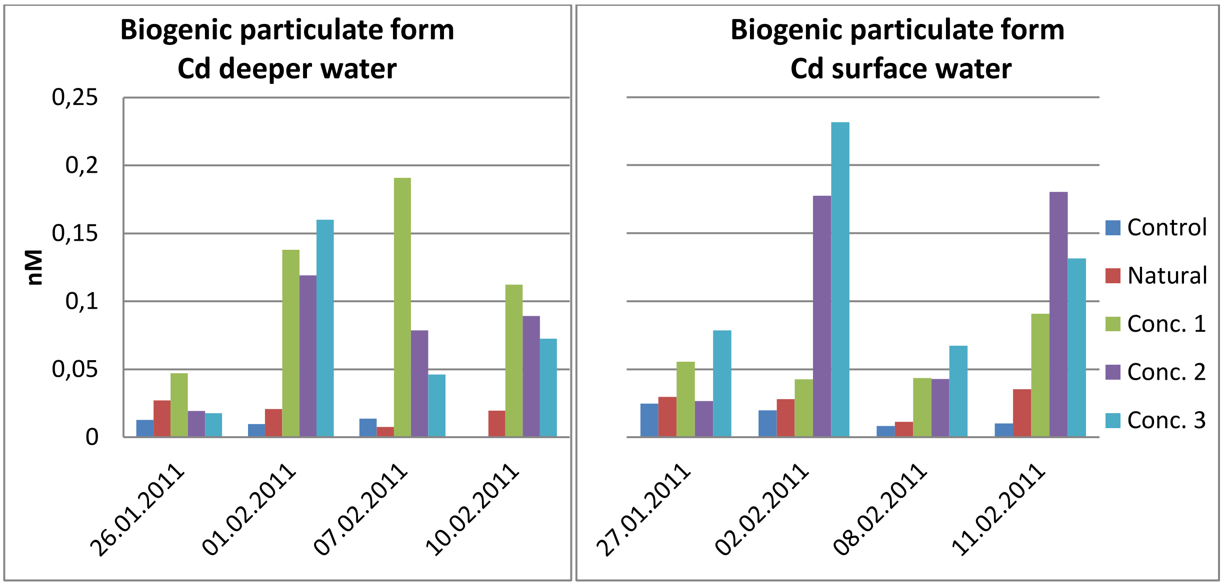


Figure 5.6: Biogenic particulate concentration of cadmium in deeper and surface water

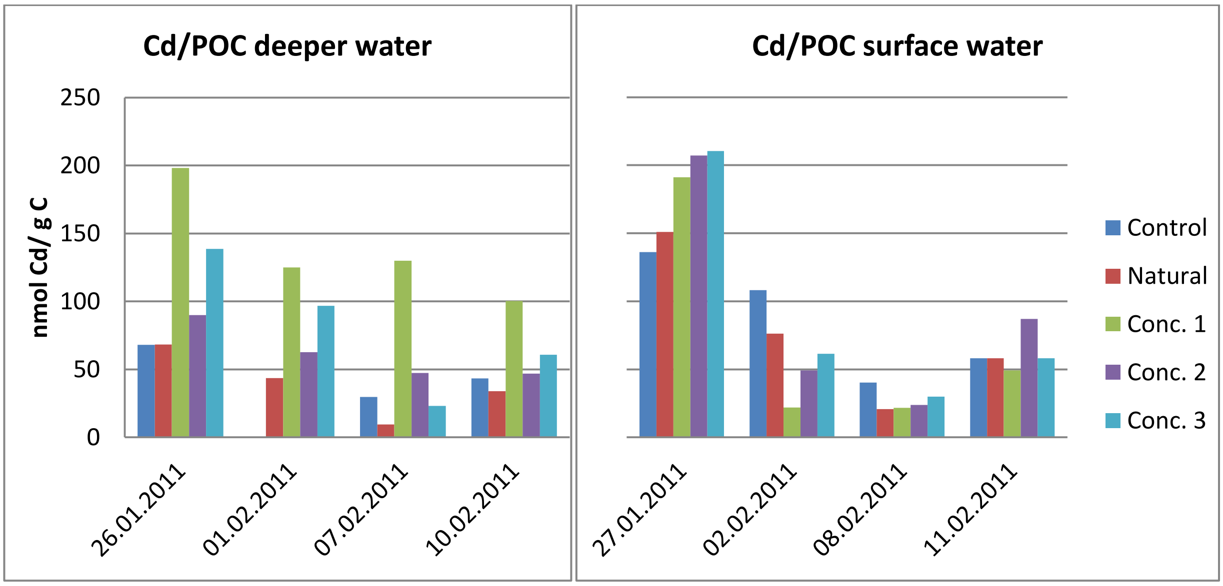


Figure 5.7: Biogenic particulate cadmium concentration normalized against particulate organic carbon in deeper and surface water

The Cd/POC graph (figure 5.7) shows that cadmium content per gram of carbon is highest in the treatment containing the lowest concentration of nutrients above natural in the deeper water, and that it decreases toward the end of the experiment. The cadmium content per gram C in the treatment with the highest nutrient concentration is relatively high in the beginning of the experiment, but it decreases toward the end.

All treatments show quite high cadmium content per g C in the start of the experiment in the surface water, but this decreases quite severely at the second sampling day and then remains at a lower level toward the end. The cadmium content per g C varies less between the treatments in the surface water than in the deeper water.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for the deeper water normalization, but not for the surface water. A Tukey's test was performed on the deeper water samples, and the treatments showing significant differences are presented in appendix table B9. The only treatments showing significant differences were the control vs. the conc. 1 treatment, the natural vs. the conc. 1 treatment and the lowest vs. the conc. 3 treatment.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface cadmium concentration showed a positive correlation, but the relationship was found to be insignificant for the both. A summary of the linear regression is given in appendix table B10.

5.5.4 Fractionation

In general it seems that the larger fractions (> 140 µm and > 20 µm) are the ones to take up more cadmium as more nutrients are added in the deeper water (figure 5.8). At the very end of the experiment, the 140 µm fraction dominates the conc. 1 treatment, while the 20 µm fraction dominates the conc. 3 treatment. The conc. 2 treatment has a more even distribution of metal within the fractions.

In the surface water the two larger fractions seem to be dominating in the middle of the experiment, while at the end this evens out more especially for the two treatments with the highest nutrient concentrations. In the conc. 2 treatment the cadmium concentration is somewhat evenly distributed between the three largest fractions (> 140 µm, > 20 µm and > 10 µm). Unfortunately the filter paper containing the > 2 µm fraction was lost, and so there is no information about this fraction for the last sampling day of the conc. 2 treatment. The conc. 3 treatment is dominated by the 140 µm fraction at the end of the experiment, and is showing lower cadmium concentration in the > 10 µm fraction than in the conc. 2 treatment.

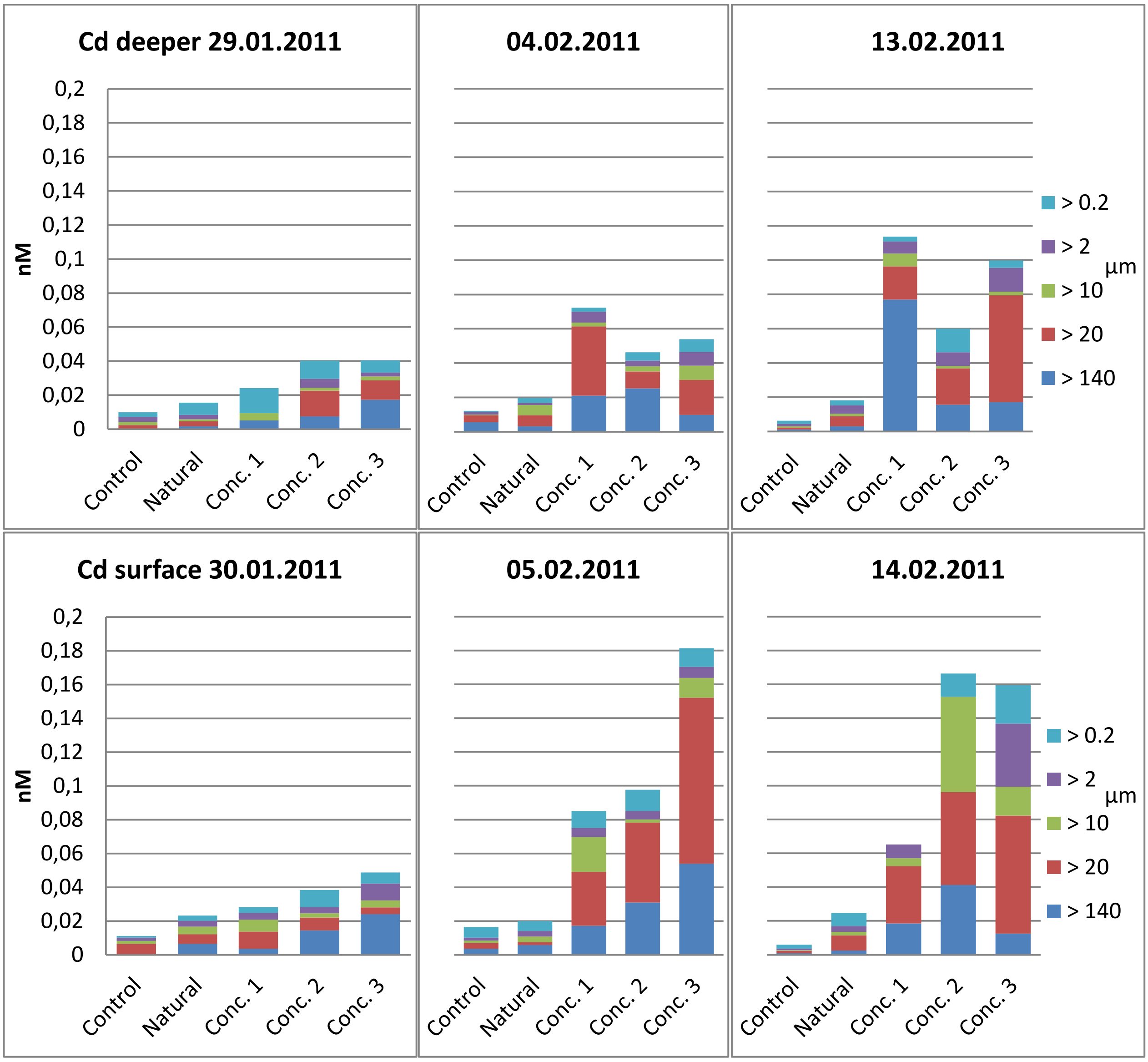


Figure 5.8: Size fractionation of particulate cadmium concentration in deeper and surface water

5.6 Molybdenum

5.6.1 Chelex

In the deeper water, there is a clear difference between the control/natural treatments and the three treatments with higher ammonium additions (figure 5.9). There are much higher concentrations of chelex-labile molybdenum in the control and natural treatments than in the high ammonium treatments.

In the surface water the fluctuations throughout the experiment are greater than in the deeper water, but at the end of the experiment there is a similar trend (the last value for the natural concentration is thought to be erroneous), where the higher ammonium concentration treatments have lower concentrations of chelex-labile molybdenum than the control treatment.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments for the deeper or the surface Chelex samples.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. A negative correlation was found for both deeper and surface molybdenum concentration, but the relationship was found to be significant only for the deeper. The R^2 value shows that 67.1% of the total regression is explained by the regression of NH_4^+ and Mo for the deeper concentration. A summary of the linear regression is given in appendix table B11.

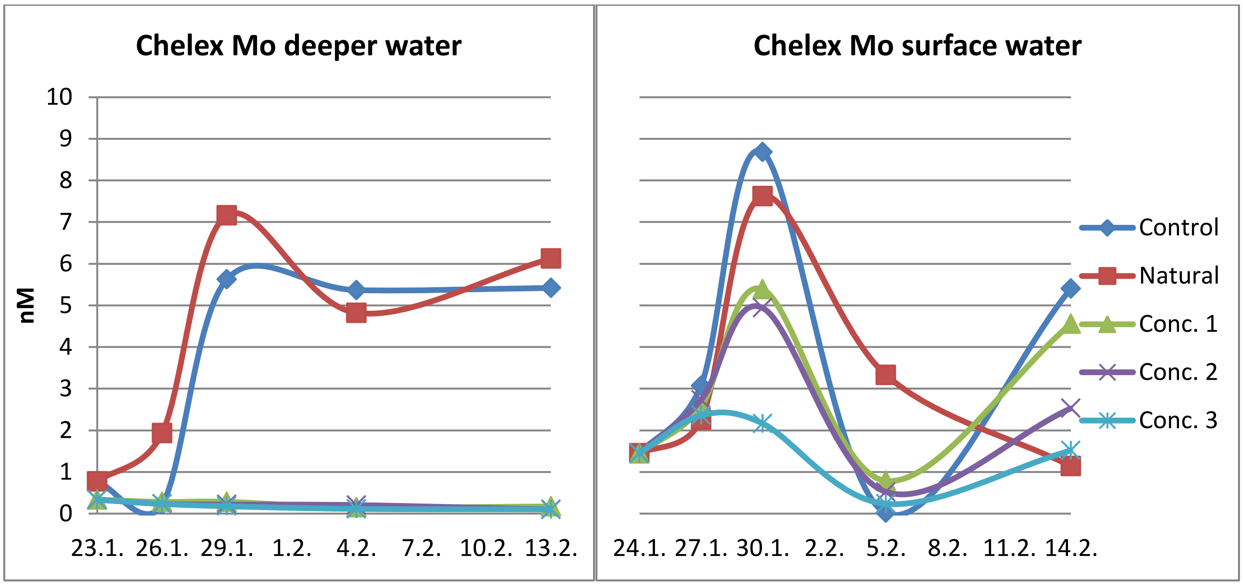


Figure 5.9: Chelex labile molybdenum concentration in deeper and surface water

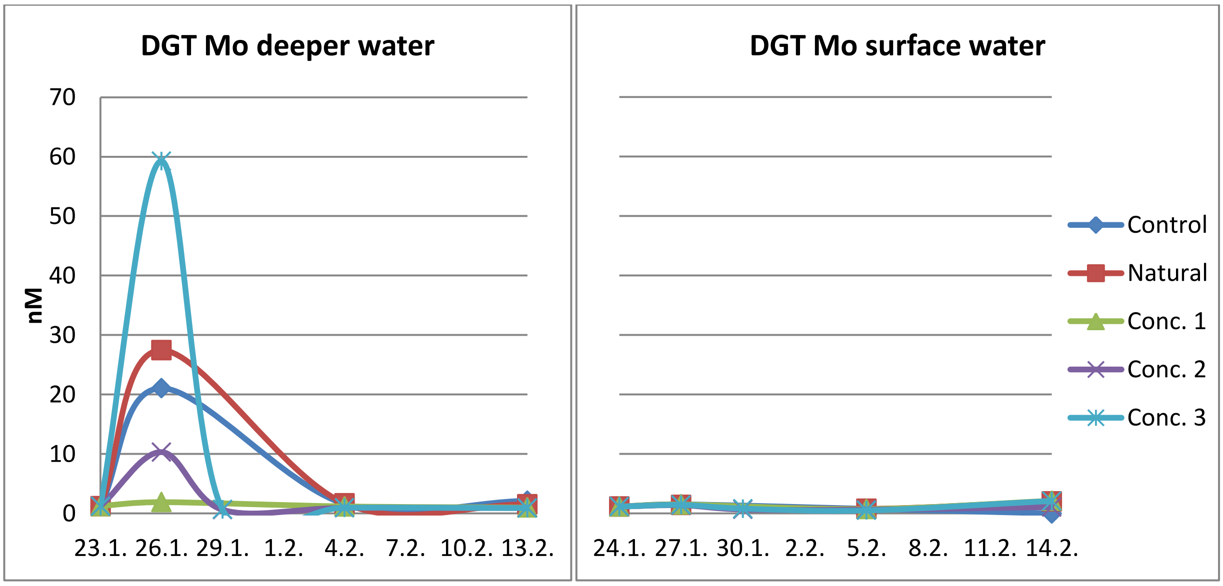


Figure 5.10: DGT labile molybdenum concentration in deeper and surface water

5.6.2 DGT

In the deeper water, all the treatments (except the conc. 1 treatment) show a very clear peak in the molybdenum concentration at the second sampling day, with the conc. 3 treatment showing the highest concentration of molybdenum (figure 5.10, means and standard deviations in appendix table B12). All treatments then decrease to a level much closer to zero for the remainder of the experiment.

The surface treatments have low fluctuations and no clear trend when considering DGT-labile molybdenum concentration.

A one-way ANOVA was done for the last sampling day, to test whether the treatments showed significant differences at the very end of the experiment. This analysis showed significant differences between the treatments, both in the deeper and the surface water DGT samples. A Tukey’s test was performed, and the treatments showing significant differences are presented in appendix table B13.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water showed a negative correlation, but the relationship was found to be significant only for the deeper, and not for the surface molybdenum concentration. The R^2 value shows that 57.4% of the total regression is explained by the regression of NH_4^+ and Mo. A summary of the linear regression is given in appendix table B14.

5.6.3 Biogenic particulate form (> 0.2 µm)

In the deeper water, the molybdenum concentration in particles does not vary much between the treatments at the start of the experiment, but at the two last samplings the conc. 1 treatment clearly contains more molybdenum in particles than the other treatments (figure 5.11). The natural treatment also contains quite high levels of molybdenum at the second to last sampling day, while it has decreased at the very last day. The conc. 2 treatment has a rise in the molybdenum concentration throughout the experiment, reaching its highest level at the very end.

The trend is quite similar in the surface water, although concentrations are generally lower throughout the experiment.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for the deeper filtration samples, but not for the surface water. A Tukey's test was performed on the deeper samples, and the treatments showing significant differences are presented in appendix table B15.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water molybdenum concentration showed a negative correlation, but the relationship was found to be insignificant for both. A summary of the linear regression is given in appendix table B16.

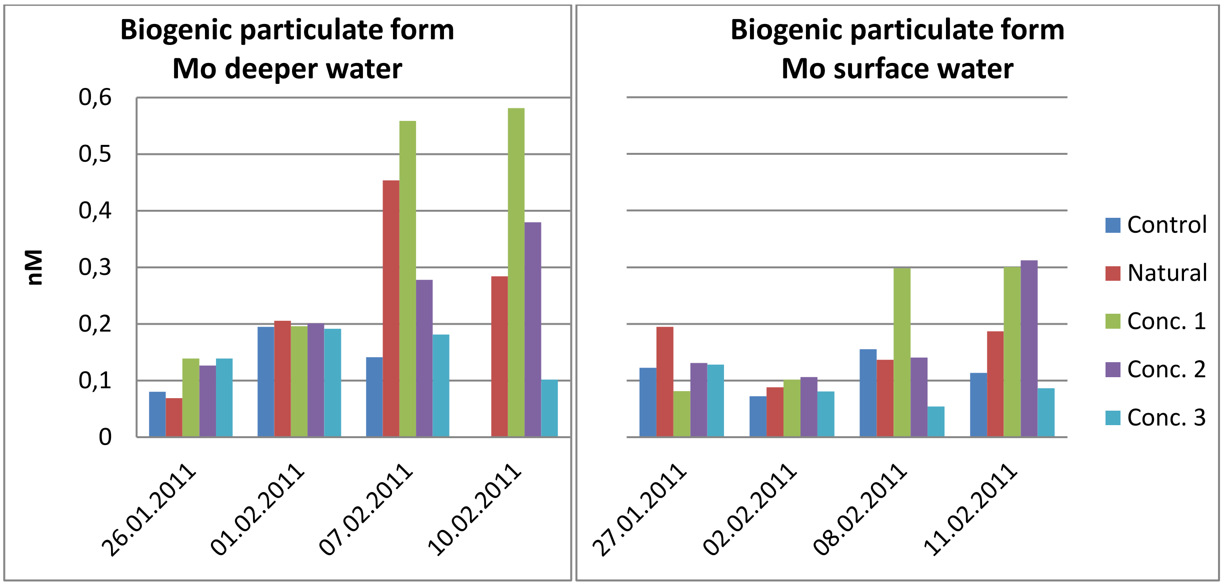


Figure 5.11: Biogenic particulate molybdenum concentration in deeper and surface water

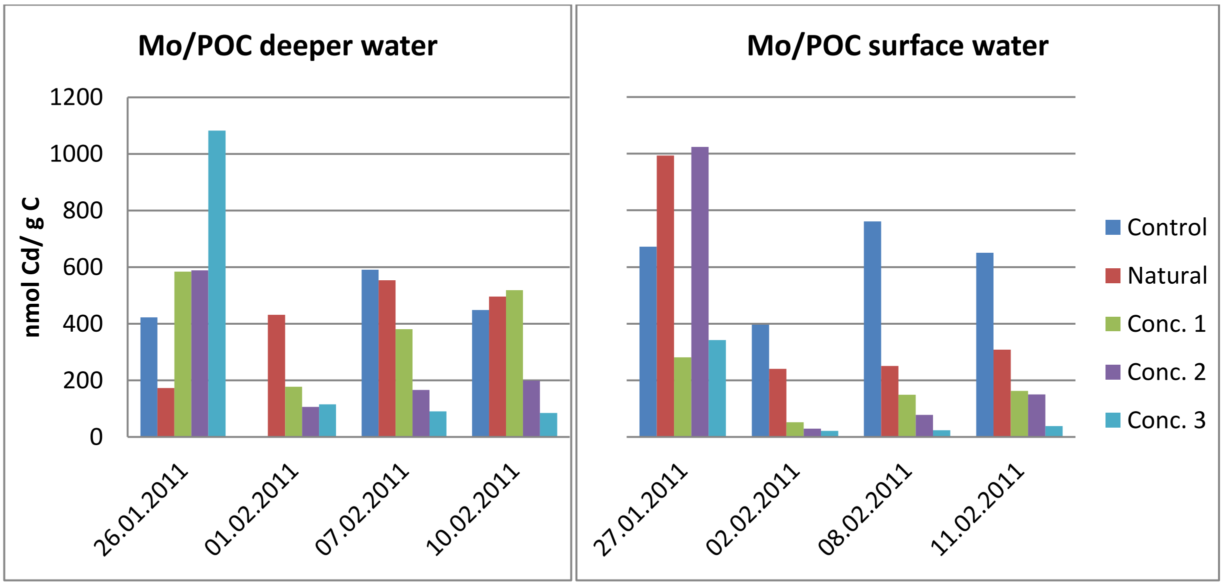


Figure 5.12: Biogenic particulate molybdenum concentration normalized against particulate organic carbon in deeper and surface water

The Mo/POC graphs (figure 5.12), both for the deeper and the surface water, show a trend of less molybdenum per g C with increasing nutrient concentration as the experiment progresses. Although individual treatments might have an increase in the Mo/C quota from date to date, the quota always show declining molybdenum content with higher nutrient concentrations when comparing the three treatments with nutrient concentrations higher than natural.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for both the deeper and the surface water normalization. A Tukey's test was performed, and the treatments showing significant differences are presented in appendix table B17. In general there are significant differences between the treatments containing low and high nutrient concentrations.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water molybdenum concentration showed a negative correlation to the nutrient concentration, and the relationship was found to be significant for both. The R^2 values show that 91,0% of the total regression is explained by the regression of NH_4^+ and Cd for the deeper samples, while 57,1% of the total regression is explained by the regression of NH_4^+ and Cd for the surface water samples. A summary of the linear regression is given appendix table B18.

5.6.4 Fractionation

The clearest result in the deeper water is the high metal content in the > 140 µm fraction in the conc. 1 treatment at the very end of the experiment (figure 5.13). Close to 60 % of the total molybdenum concentration is contained in this fraction. There is also a clear increase in the > 20 µm fraction in the natural and conc. 1 treatments in the middle of the experiment, as well as in the conc. 1 treatment at the last sampling day.

In the surface water there is an increase in molybdenum concentration in the > 140 µm fraction in the conc. 1 and conc. 2 treatments at the end of the experiment. The conc. 3 treatment however has most of the molybdenum concentration divided by the 0.2 and 2 µm fractions. There are less changes in the surface water than in the deeper water.

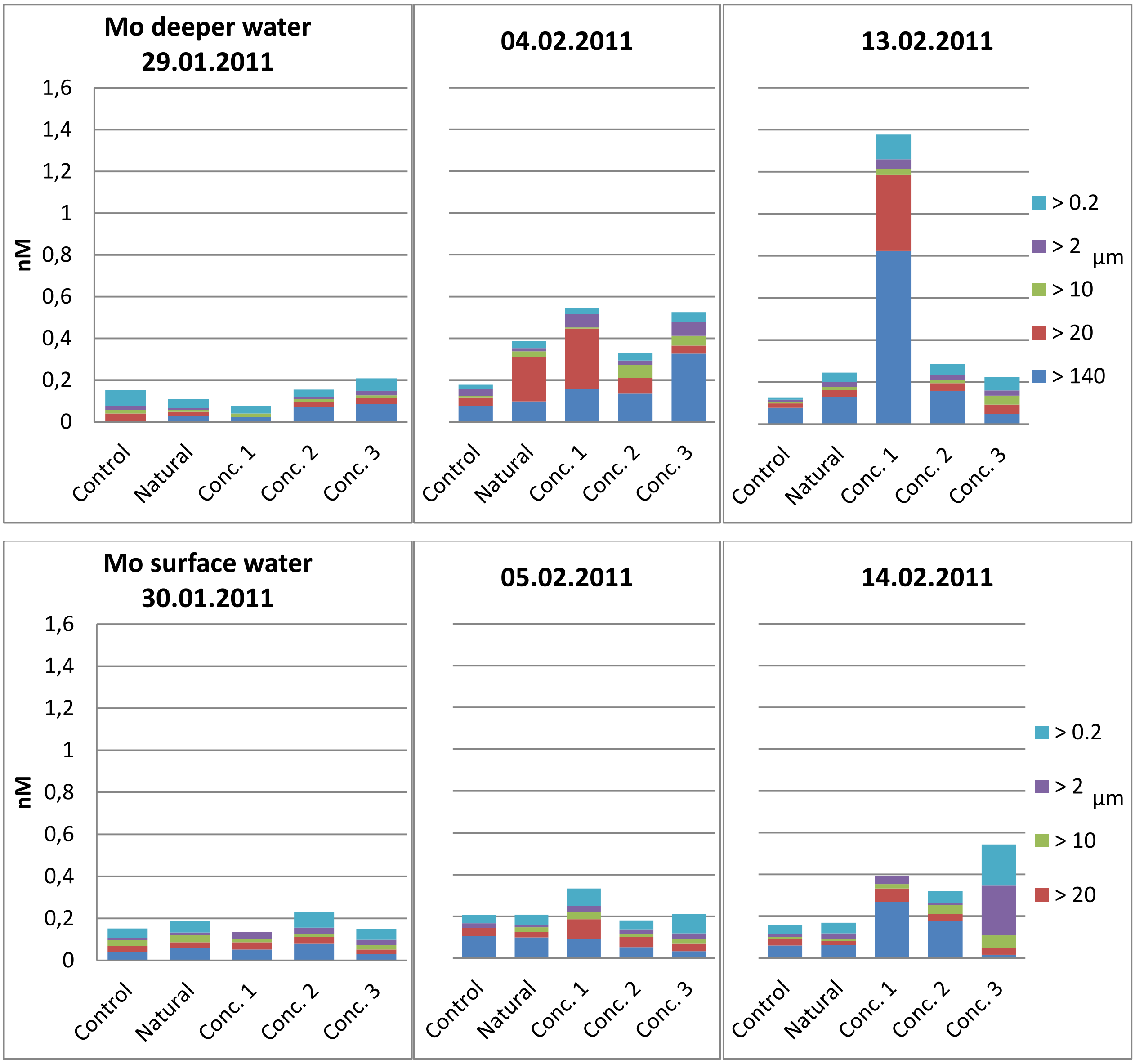


Figure 5.13: Fractionation of biogenic particulate molybdenum concentration in deeper and surface water

5.7 Nickel

5.7.1 Chelex

The chelex-labile nickel concentration in the deeper water shows a peak at the second sampling day for all treatments except the control, the high ammonium treatments having the highest chelex-labile nickel concentration (figure 5.14). The trend remains quite linear for the rest of the experiment for all treatments. At the end of the experiment there is a slight separation between low ammonium and high ammonium treatments; the low ammonium treatments having a higher chelex-labile nickel concentration.

In the surface water the chelex-labile nickel concentration remains quite unchanged throughout the experiment, the biggest fluctuations found in the control and the natural treatments at the fourth sampling day. As in the deeper water, at the end of the experiment there is a slight separation between high ammonium and low ammonium treatments. Here the conc. 1 treatment, as well as the control and natural have higher chelex-labile nickel concentrations than the higher ammonium treatments.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments for the deeper or the surface water Chelex samples.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. A negative correlation was found for both the deeper and the surface water nickel concentration. The relationship was found to be insignificant for both. A summary of the linear regression is given in appendix table B19.

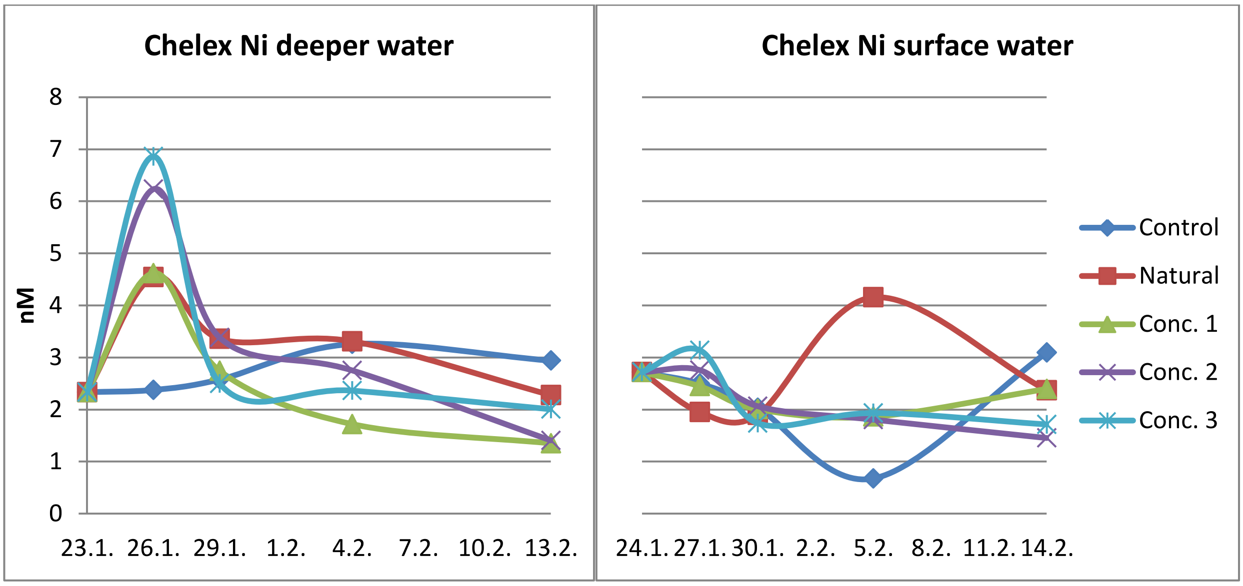


Figure 5.14: Chelex labile nickel concentration in deeper and surface water

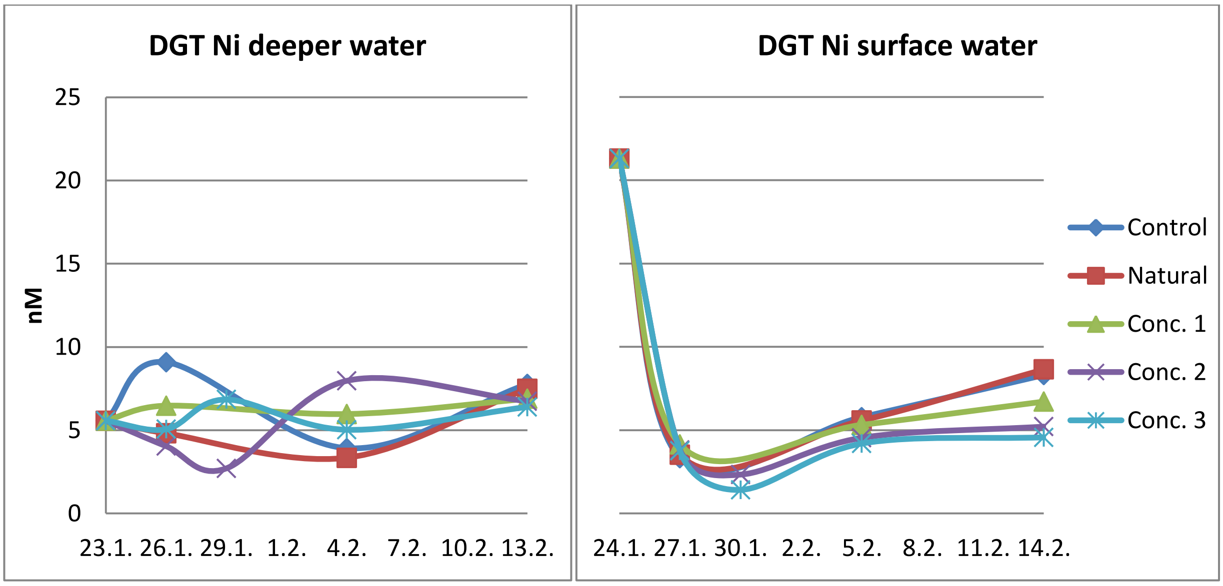


Figure 5.15: DGT labile nickel concentration in deeper and surface water

5.7.2 DGT

In the deeper water the DGT-labile nickel concentration changes little throughout the experiment (figure 5.15, means and standard deviations in appendix table B20). There are some fluctuations within the treatments, but they generally differ little from each other. The nickel concentration in the surface water starts out quite a bit higher than in the deeper water, but drops steeply already at the second sampling day. After this there is a general, slight upward trend for all the treatments. At the end of the experiment there is a slight separation between low ammonium and high ammonium treatments. The treatments with higher ammonium concentrations have a lower DGT-labile nickel concentration.

A one-way ANOVA was done for the last sampling day, to test whether the treatments showed significant differences at the very end of the experiment. This analysis showed significant differences between the treatments, both in the deeper and the surface water DGT samples. A Tukey’s test was performed, and the treatments showing significant differences are presented in appendix table B21.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. The relationship was found to be significant in both the deeper and the surface water, displaying a negative correlation between the nutrient loads and the nickel concentration. The R^2 values show that 67.8% of the total regression is explained by the regression of NH_4^+ and Ni for the deeper concentration, while 84.8% of the total regression is explained by the regression of NH_4^+ and Ni for the surface water concentration. A summary of the linear regression is given in appendix table B22.

5.7.3 Biogenic particulate form (> 0.2 µm)

The deeper water shows a clear increase in the nickel concentration in particles in the three treatments containing higher than natural nutrient concentrations almost until the end of the experiment (figure 5.16). At the very end there is a decrease, although a quite small one for the conc. 2 treatment, which is the treatment with the highest particulate nickel concentration throughout the experiment.

The surface water show a similar trend, although both concentrations and differences between treatments are lower than in the deeper water.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for the deeper water filtration samples, but not for the surface water. A Tukey's test was performed on the deeper water samples, and the treatments showing significant differences are presented in appendix table B23.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper water and surface water nickel concentration showed a positive correlation to the nutrient loads, but the relationship was found to be significant only for the surface water samples. The R^2 value shows that 73.6% of the total regression is explained by the regression of NH_4^+ and Ni. A summary of the linear regression is given in appendix table B25.

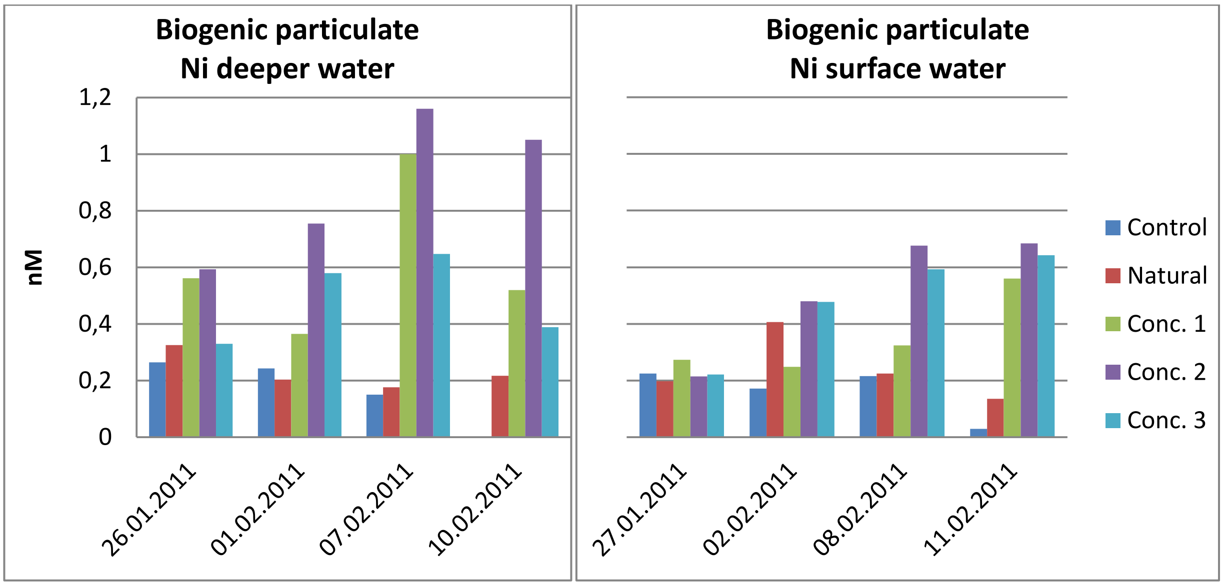


Figure 5.16: Biogenic particulate nickel concentration in deeper and surface water

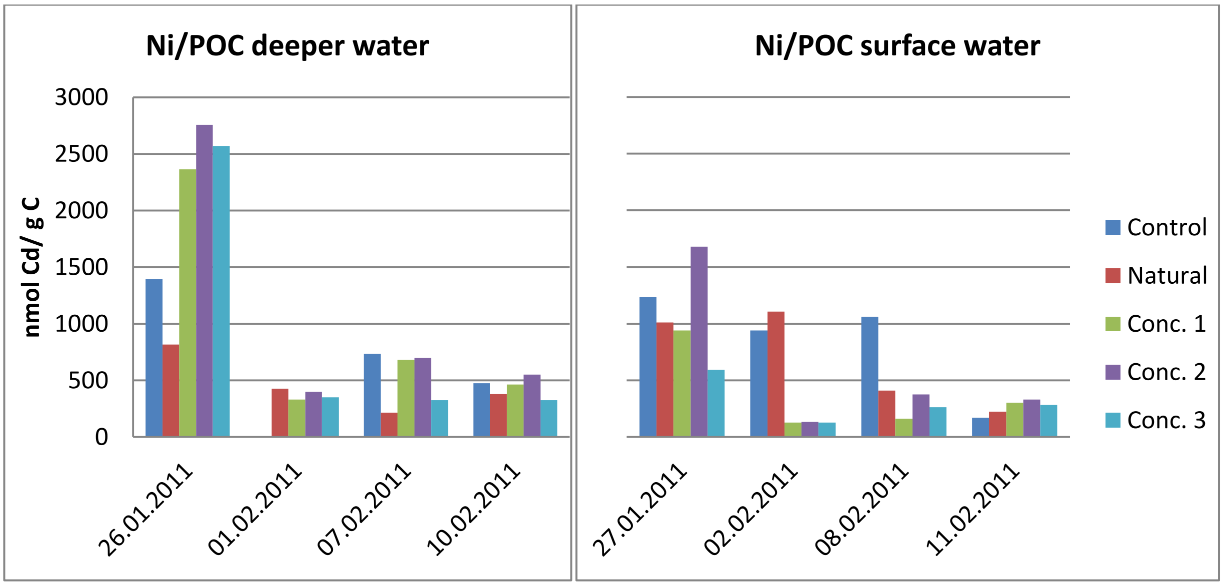


Figure 5.17: Biogenic particulate nickel concentration normalized against particulate organic carbon in deeper and surface water

In the both surface and deeper water there is a higher Ni/POC quota at the start of the experiment (figure 5.17). As the experiment progresses there are some fluctuations in the Ni/POC quota, but no clear trend from low to high ammonium treatments in the deeper water. There is a higher Ni/POC quota in the control and natural treatments in the surface water in the middle of the experiment, before it evens out at the end, and there is no longer any pronounced difference between the treatments.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments for neither the deeper nor the surface water normalization.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water Ni/POC quota showed a negative correlation to the nutrient concentration, but the relationship was found to be insignificant for both. A summary of the linear regression is given appendix table B25.

5.7.4 Fractionation

The only treatments really standing out are the conc. 2 and conc. 2 treatments at the middle of the experiment in the deeper water (figure 5.18). In the conc. 2 treatment the cadmium concentration is distributed mainly between the > 20, > 10 and > 0.2 µm fractions. The nickel concentration in the > 2 and > 140 µm fractions is still higher than in rest of the experiment. In the conc. 3 treatment the dominating fraction is the > 2 µm one, followed by the > 10 µm. The remaining nickel concentration is fairly evenly distributed between the > 0.2, > 20 and > 140 µm fractions. In the surface water there is no similar peak in the middle of the experiment, and concentrations seem to be higher in the smallest fractions.

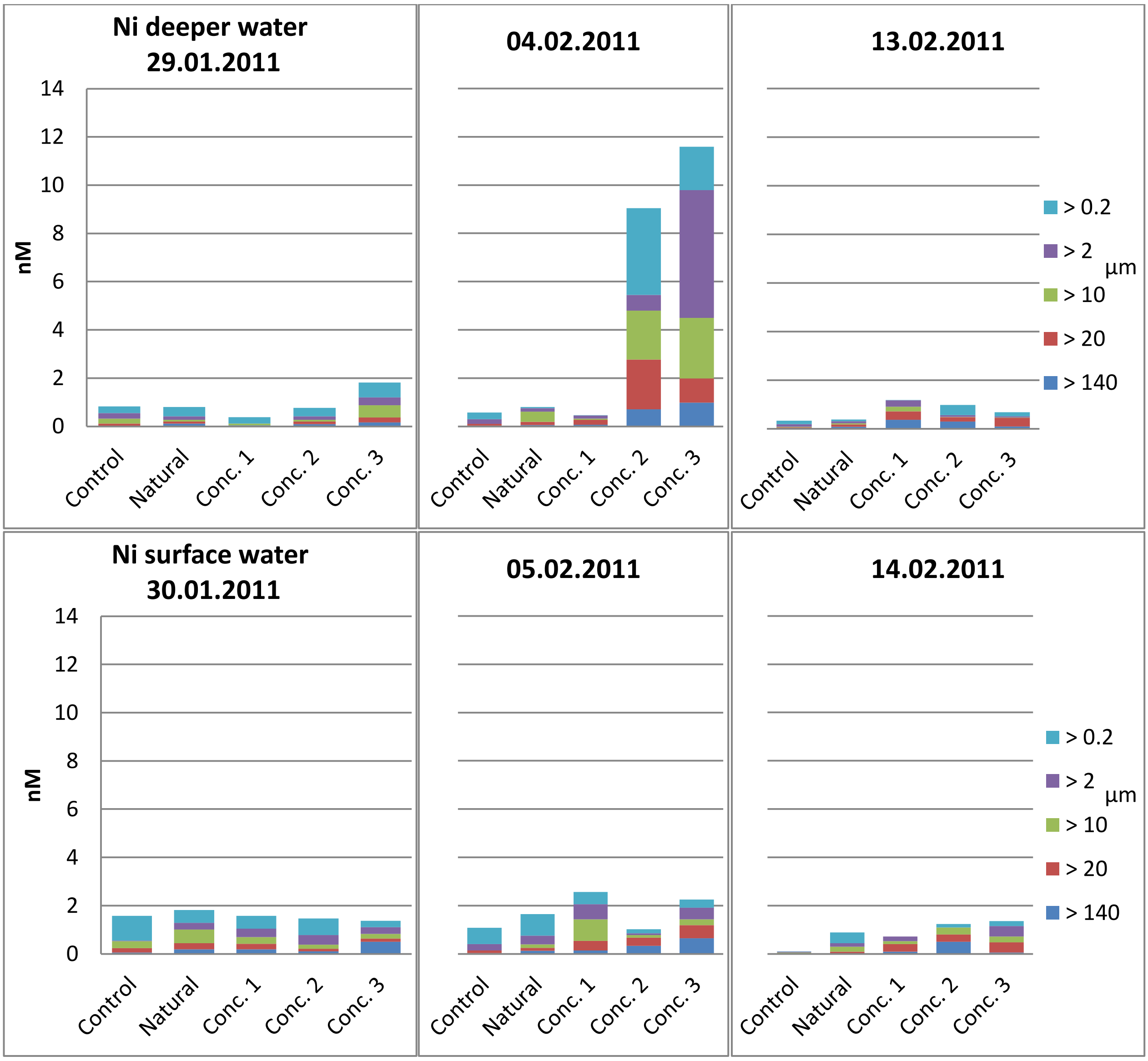


Figure 5.18: Fractionation of biogenic particulate nickel concentration in deeper and surface water

5.8 Copper

5.8.1 Chelex

In the deeper water the chelex-labile copper concentration varies very little from the start to the end of the experiment, but there seems to be a slight separation between high and low ammonium treatments at the very end (figure 5.19). Concentrations are slightly higher in the low ammonium treatments. In the surface water there is a slight downward trend at the start of the experiment, before the concentration increases at the end of the experiment. The control treatment shows a decrease in the copper concentration that lasts longer at the start of the experiment, as well as a steeper increase in concentration at the very end of the experiment.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments for the deeper or the surface water Chelex samples.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. A negative correlation was found for both the deeper and the surface water copper concentration. The relationship was found to be insignificant for both. A summary of the linear regression is given in appendix table B27.

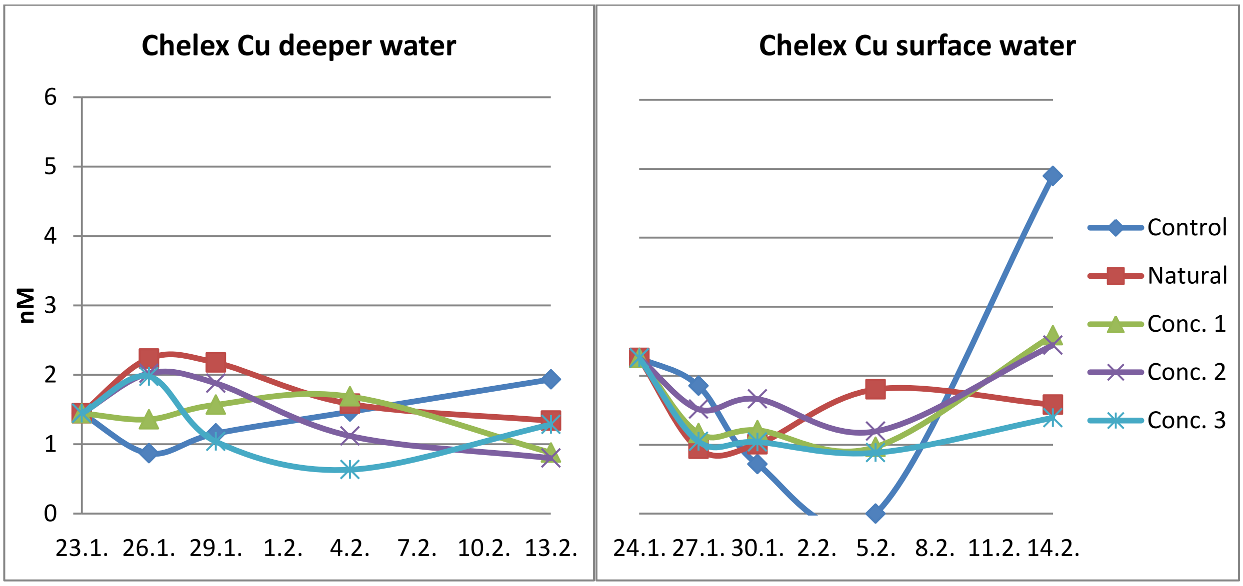


Figure 5.19: Chelex labile copper concentration in deeper and surface water

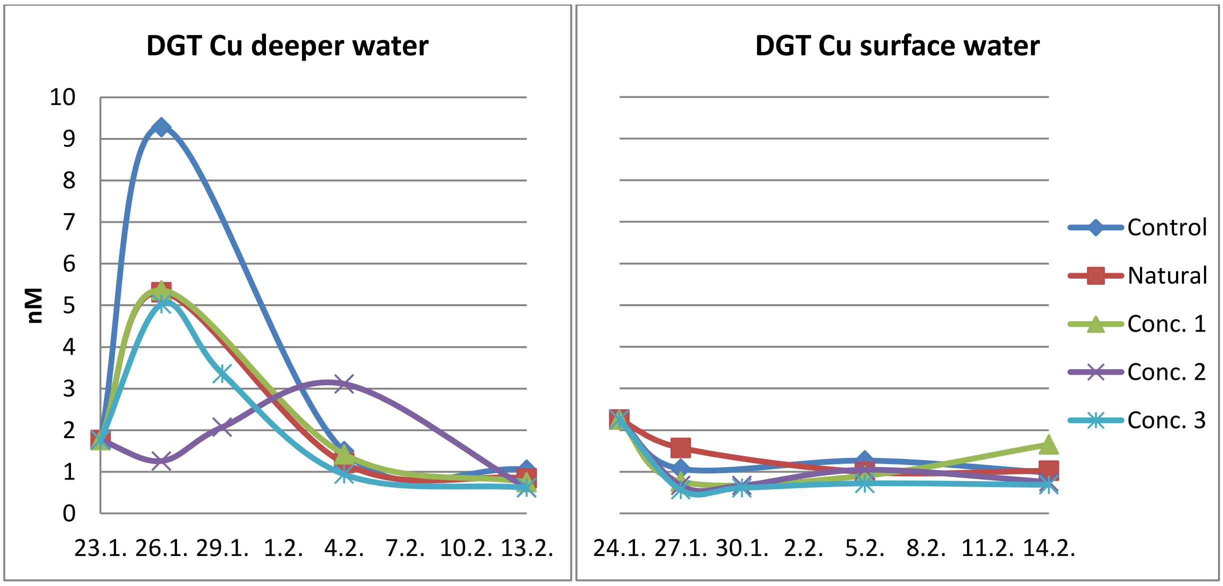


Figure 5.20: DGT labile copper concentration in deeper and surface water

5.8.2 DGT

In the deeper water there is a peak in the copper concentration for all treatments except conc. 2 at the second sampling day (figure 5.20, means and standard deviations in appendix table B26). The copper concentration in all of these treatments then flattens out toward the end of the experiment. The concentration in the conc. 2 treatment however rises to a peak at the fourth sampling day, before decreasing to a level similar to the other treatments at the last sampling day. There seems to be a small separation between high ammonium and low ammonium treatments at the end of the experiment.

The copper concentration in the surface water treatments all decrease slightly from the first to the second sampling day and then show a fairly linear trend throughout the rest of the experiment. There seems to be a small separation between high ammonium and low ammonium treatments at the end of the experiment.

A one-way ANOVA was done for the last sampling day, to test whether the treatments showed significant differences at the very end of the experiment. This analysis showed significant differences between the treatments, both in the deeper and the surface water DGT samples. A Tukey's test was performed, and the treatments showing significant differences are presented in appendix table B27.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. The relationship was found to be significant in both the deeper and the surface water, displaying a negative correlation between the nutrient loads and the copper concentration. The R^2 values show that 65.7% of the total regression is explained by the regression of NH_4^+ and Cu for the deeper concentration, while 41.0% of the total regression is explained by the regression of NH_4^+ and Cu for the surface water concentration. A summary of the linear regression is given in appendix table B28.

5.8.3 Biogenic particulate form (> 0.2 µm)

The conc. 2 treatment is the one showing the highest rise in particulate copper concentration in the deeper water (figure 5.21). It rises quite much from the first to the second sampling day, and then declines steadily towards the end of the experiment. The conc. 1 and conc. 3 treatments also show a rise in copper concentration from the first day, but peak at the third sampling day before declining.

In the surface water there are less fluctuations within treatments and also less variations between treatments. The trend here seems to be a alight general rise in particulate copper concentration with time.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed no significant differences between the different treatments for the deeper or the surface water filtration samples.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water copper concentration showed a positive correlation to the nutrient loads, but the relationship was found to be insignificant both. A summary of the linear regression is given appendix table B29.

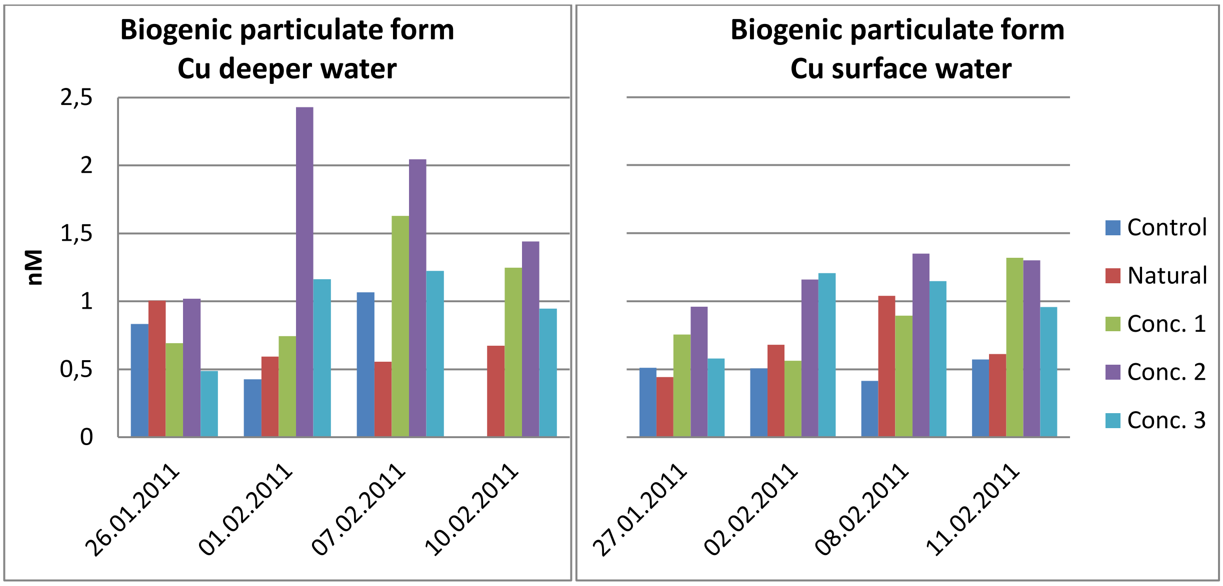


Figure 5.21: Biogenic particulate copper concentration in deeper and surface water

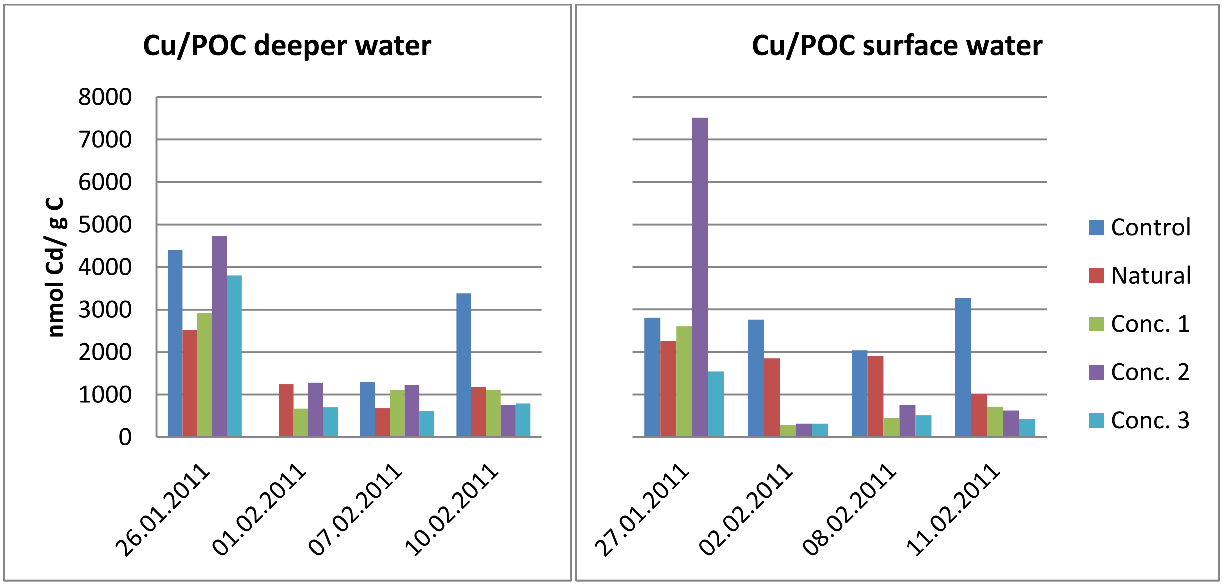


Figure 5.22: Biogenic particulate copper concentration normalized against particulate organic carbon in deeper and surface water

The Cu/POC quota in the deeper water shows a general decrease as the experiment progresses (figure 5.22). There is not much difference between the treatments, except for a higher Cu/POC quota in the control treatment at the very end of the experiment.

The Cu/POC quota in the surface water shows a general declining trend for all the treatments added nutrient concentrations higher than natural. The control and the natural treatment remain relatively unchanged throughout most of the experiment. The Cu/POC quota in the conc. 2 treatment is quite high at the first sampling day, and this is by far the treatment showing the greatest decrease by the second sampling day.

A one-way ANOVA was done for the last two sampling days, to test whether the treatments showed significant differences at the very end of the experiment. This showed significant differences between the different treatments for the surface water normalization, but not for the deeper water. A Tukey's test was performed, and the treatments showing significant differences are presented in appendix table B30.

A linear regression was performed for the last day of the sampling, to test the relationship between metal concentration and nutrient addition. Both deeper and surface water Cu/POC quota showed a negative correlation to the nutrient concentration, but the relationship was found to be significant for only for the surface water normalization. The R^2 value shows that 46.4% of the total regression is explained by the regression of NH_4^+ and Cu in the surface water normalization. A summary of the linear regression is given in appendix table B31.

5.8.4 Fractionation

In the deeper water the treatment standing out most from the rest is the conc. 3 treatment at the second sampling day (figure 5.23). It is dominated by the > 2 µm fraction, with the > 0.2 and > 10 µm fractions being the second biggest. At the start of the experiment the treatments are all dominated by the smallest particulate fraction, while as the experiment progresses the copper concentration is distributed more between the other size fractions as well.

In the surface water there are more fluctuations within and between treatments. At the second sampling day the control and natural treatments shows a high copper concentration in the > 0.2 µm fraction, while in the conc. 3 treatment the > 140 µm fraction is the dominating one. At the last sampling day the conc. 3 treatment is the one to stand out, with high copper concentrations in the > 0.2 and > 2 µm fractions. Generally there seems to be more copper in the smaller fractions in several of the treatments throughout the experiment.

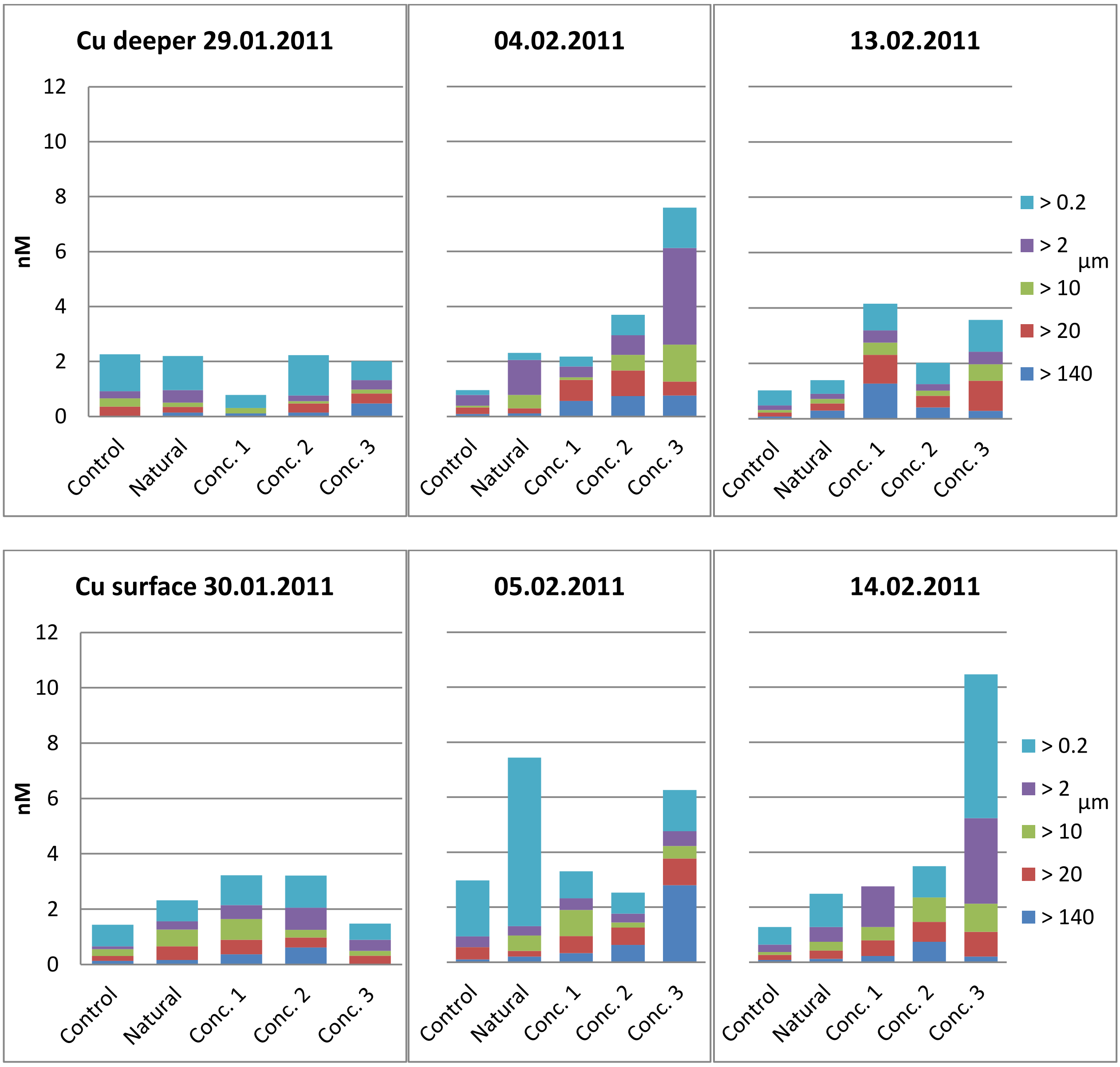


Figure 5.23: Fractionated biogenic particulate copper concentration in deeper and surface water

6 Discussion

The measurements done with the direct sampling technique turned out to be poor. There seemed to be either too much contamination, or in some cases too low initial concentrations of metal in the water samples. Similar difficulties have been encountered previously (Murat Ardelan, personal communication). This lead to unreadable graphs showing few or no trends, and it was hard to draw any knowledge from these results. The results are presented in results sheets in appendix C. Poor results were obtained from the total chelex samples as well, and these are also only presented in appendix C. The lack of parallel samples for all techiniques except the DGT's mean that there are less certainty in the eccuracy of the values. This of course affects the possibility of doing statistical analysis as well.

We do expect different results from the DGT-labile metal concentrations and the chelex-labile metal concentrations. This is due to the fact that the techniques acquire different amounts of metal. With the DGT-method, the metal in solution has to pass both a filter and a gel before being able to bind to the chelex resin that is contained within the gel. This means that bigger complexes and colloids will be stopped from coming in contact with the resin. However, as these compounds can settle on the filter, or some even between the filter or gel if small enough, there is a change that they could leach metals as time passes. When using the chelex resin directly in the water samples, the resin has the potential of being in contact with all types of metal containing compounds in the sample at all times. This gives the resin the possibility to bind to metals that are weakly complexed, that would not be available to the DGT because of size. At the same time, it does not give the possibility of metal leaching that is potentially happening with the DGT technique. Another important aspect of the DGT device, is that the salinity affects the diffusion of metals to the inner part of the gel, and thus the ability of metal binding to the resin (International Network for Acid Prevention, 2012). In river and surface samples, where salinity is lower, this could mean erratic measurements. For these reasons it is expected that the concentrations found with the DGT's and the chelex resin will not be the same. This also gives the possibility of different trends emerging from the two different techniques, seeing as they potentially bind different fractions of metals in the water.

Number of days used for shaking of the DGT's in the water samples were chosen on background of previous work done by Murat Ardelan as well as other literature on the subject (Garmo, et al., 2003, Ardelan, et al., 2009). Three days was chosen so as to give metals in solution time to actually diffuse through to the innermost part of the gel and bind to the resin, while at the same time hopefully preventing the formation of a biofilm on the outer filter of the DGT device.

The DGT method is a relatively new method, still undergoing development and testing. One can for instance question whether test done on the effect of turbulence on diffusion so far have been extensive enough to ensure that values given for the diffusion coefficients for the various trace metals are accurate. Any changes in these values will severely affect the calculations of metal flux to the chelex gel, which in turn will change the calculated final concentration of metal in the sample (International Network for Acid Prevention, 2012(Dunn, et al., 2003)). However, as these potential errors are the same in all samples using the DGT method, the trend observed is still valid.

River samples

In general one might expect higher concentrations of metals higher up the river because of input form sediment and soil. Chemical or geochemical removal processes might however give nonlinear concentration profiles from high river to full ocean water. All of the metals show different concentrations and trends from low salinity to high salinity water when comparing DGT labile and chelex labile fractions, which was expected because of the methodological differences and the potential effect of salinity on the DGT's.

Depth profiles

Concentrations are expected to differ between the methods. Lower salinity values at the surface could affect concentrations, and thus give results that are not fully comparable to the deeper water samples. The profile for cadmium is a typical nutrient like profile, with surface depletion and higher concentrations with depth. This is a typical distribution profile for cadmium (Bruland, 1980, Saager, et al., 1992). Molybdenum is usually expected to show little variation in concentration with depth (Collier, 1985)., which is the case for the DGT labile concentrations. For the chelex labile concentration there are more fluctuations, and this could be due to method limitations discussed further in section 6.2. The nickel concentrations show somewhat of a nutrient like profile, which is to be expected (Bruland, 1980). The copper concentrations show more of a nutrient like profile in the chelex labile fraction, than in the DGT labile fraction. Copper has previously been shown to have a less nutrient like profile than other micronutrients, and even a close to linear increase in concentration with depth (Nolting, et al., 1991, Bruland, 1980).

Particulate organic carbon and dissolved organic material

The POC measurements show a clear growing bloom that has a peak at the middle of the experiment. All high ammonium treatments have higher biomass than the control and natural treatments. The addition of ammonium has in other word had a great influence on the production of biomass, as was expected.

It would have been interesting to have POC fractionation values. This would have given us the opportunity to see how the different fractions grow as the experiment progresses, and it would have given more meaning to the metal fractionation data, as it could have been used for normalization, but unfortunately necessary biological data is not available yet. A normalization of metal against POC for each size fraction would have given the possibility to see whether metal concentrations in a fraction are high because of the fraction's increased growth (no/little changes in Me/POC quota) or because the fraction is taking up more or less metal on a g carbon basis (Me/POC quota decreasing/increasing). The values we have only show the changes in total concentration within the fraction, without showing whether or not the fraction itself is growing in size (cell size or cell count).

There was a pronounced increase in DOM molecules containing N and S. These changes could potentially have dramatic effects on the organic complexation of metals, regarding the strength, stability and functionality of organic metal complexes in the water (Murat Ardelan, personal communication). This change could also be responsible for some of the removal of dissolved forms or metal in the water, in turn making less metal available for biological uptake.

6.1 Cadmium

The chelex results for cadmium (figure 5.4) are relatively inconclusive, seeing as there are big fluctuations and it's hard to see trends. Despite of this there is the separation between high ammonium and low ammonium treatments at the very end, suggesting that the ammonium addition leaves less chelex-labile cadmium in the water. This could not be supported by the statistical analysis, but is still a visual picture worth noticing.

The DGT graphs showing the cadmium concentration throughout the experiment (figure 5.5) suggests that DGT labile cadmium decreases with time. As nutrients are added, more cadmium seems to be either incorporated into biomass, or possibly other particles. Also evident is the fact that the treatments containing more nutrients have a lower cadmium concentration, suggesting that the more nutrients are added, the higher the particular/biological removal of cadmium becomes. These trends are the same in both the deeper and the surface water, although more pronounced in the deeper water. This trend coincides quite well with the trends found in the filtration results (figure 5.6). All though the cadmium concentration in particles doesn’t follow the exact opposite trend of the one in the DGT results, it gives means of comparison. As sampling dates are different for DGTs and filtration, this also means direct comparison is not possible. As mentioned in section 3.5.5, Luoma et al (1998) showed an increase in the cadmium concentration in marine phytoplankton during a period of spring bloom in the San Fransisco Bay (USA). At the same time they observed a decrease in the dissolved cadmium concentration by 50 %. Wang and Dei (2001) also showed an increased uptake of cadmium by phytoplankton under nutrient enriched conditions which coincides with some of the findings made in this project. One might expect from this to find that the higher ammonium treatments also had the higher biogenic particulate concentrations of cadmium, as well as higher Cd/POC quota. This is however not what was found here (figure 5.7). The deeper water cadmium concentration in particles is by far lowest in the control and the natural treatments. All three treatments added nutrients above natural levels show a higher uptake of cadmium, and the highest is found in the conc. 1 treatment, which is to say the treatment added the lowest concentration of nutrients above natural, and the ammonium concentration most likely closest to a realistic aquaculture enrichment scenario (Murat Ardelan, personal communication). Comparing this to the Cd/POC quota there is a similar trend – cadmium concentration is higher in the treatment with a lower nutrient concentration (above natural). This suggests that although nutrient enrichment increases cadmium uptake, it only does so to a certain point. As nutrient concentrations become even higher, it seems that cadmium uptake is somehow inhibited. Xixi Lau found in her master thesis work , which is also a part of the large WAFOW collaborative project, that the highest flux of ammonium lead to a decreased toxicity for phytoplankton communities in mesocosm tanks compared to similar additions done in less ammonium enriched conditions or natural flux, suggesting that some mechanism causes cadmium to be less toxic to the phytoplankton community when ammonium concentrations are high (Lau, 2012). This work supports my findings of less cadmium per g C when ammonium concentrations are very high (the conc. 2 and conc. 3 treatments). It seems that the decreased toxicity could be due to a lower cadmium uptake by the phytoplankton, and that this decreased uptake is due to the high ammonium concentration.

In the surface water there are higher biogenic concentrations of cadmium in the high ammonium treatments both in the middle and at the end of the experiment (figure 5.6). When looking at the normalized values however (figure 5.7), there is no clear variation of Cd/POC quota related to ammonium concentration. The quotas are all quite high at the end of the experiment, and decrease to similar low levels at the experiment progresses. This suggests that enrichment through high ammonium concentration does not affect particulate cadmium concentration in surface water, and that there is a definite difference between surface water and deeper water when it comes to cadmium uptake in the biomass in these enrichment conditions.

The statistics that were done for the very end of the experiment showed that the DGT results had significant differences between the control/natural treatments and the high nutrient concentration treatments (appendix table B5). Differences were not found between the control and the natural treatments, neither between the highest and second highest ammonium concentration treatments. This supports the notion that there is a clear difference between natural conditions and nutrient enriched conditions. There was also done a linear regression of the last two sampling days (appendix table B6). The high R^2 values show that the decreasing cadmium concentration is highly related to increasing nutrient concentration (when the bloom has had time to grow).

According to several studies carried out diatoms are the plankton type most prone to substitution of zinc for cadmium in the enzyme carbonic anhydrase (Price and Morel, 1990, Lane, et al., 2005, Saito, et al., 2002). As this is the most well know enzymatic function of cadmium, it could lead to the expectation that diatoms would take up more cadmium that other plankton in situations where cadmium is present at natural levels (toxic situations are not taken into account). Also, the need for carbonic anhydrase might be greater in situations where pH increases (as in an enrichment situation) and the level of soluble CO_2 in the water decreases. Organisms that would usually take up soluble CO_2 would in CO_2 limited conditions be forced to start using CO_3^{2-} instead, and this could possibly increase the carbonic anhydrase activity in these organisms.

In the fractionation data presented in figure 5.8, the size fraction between 20 and 140 µm (fraction containing most diatoms, except larger chains of diatoms) is the one containing more cadmium throughout most of the experiment, in the three treatments with the highest nutrient concentrations. This is the case for both surface and deeper water, although there are higher concentrations of cadmium in the > 20 µm fraction in the surface water than in the deeper water. It is very hard to say whether the high concentrations in this fraction under high ammonium flux could actually be related to uptake for use in carbonic anhydrase, or in any other enzymatic processes. Because we don’t have size fractionated values for POC there is no way to tell whether there are a higher uptake of cadmium in cells, or whether the biomass in this fraction simply has grown without necessarily changing its uptake of cadmium per cell. However, there is generally a quite high concentration of cadmium in the fraction containing diatoms in the high ammonium treatments, so it seems that the higher ammonium flux is somehow causing this fraction to incorporate more cadmium, either due to increased biomass (utilization of the enrichment) or due to an increased cellular uptake of cadmium. What is also clear is that there is a more effective transport to zooplankton (> 140 µm fraction) in higher ammonium treatments than in the control and natural.

Another thing worth noticing from the fractionation results is that there seems generally to be a more efficient trophic transfer of cadmium in the surface water than in the deeper water. This can be seen in the way the two biggest fractions increase in cadmium content already in the middle of the experiment. In the deeper water there is an increase in the biggest fraction in the conc. 1 treatment at the very end of the experiment, suggesting that the response of the larger fractions is slower here. The surface water also has a rise in the cadmium concentration in the smaller fractions at the very end of the experiment. These are the fractions that initially could be expected to utilize the shift from nitrate to ammonium (Glibert, et al., 1982, Wafar, et al., 2004). This might also lead to the expectation that this fraction would increase in biomass early in the experiment as a result of this shift, in which case cadmium concentration in this fraction should have been higher at an earlier stage due to high biomass. As it is, it is hard to say whether these fractions have experienced a late bloom; the biomass only increasing at the end of the experiment, or whether there is an increased cellular uptake that causes the increased cadmium concentration. Further work on fractionated POC values could shed light on this.

It would also have been interesting to see how the zinc (and also cobalt) concentration varied compared to the cadmium concentration, in order to look deeper into a possible explanation for high cadmium values in the 20-140 µm size fraction. As zinc is the most commonly used metal at the active site of the carbonic anhydrase (Price and Morel, 1990), it would be appropriate to compare the variations between these two metals within size fractions. Unfortunately, although I did try to do analysis for zinc, the analysis gave poor results. It was concluded that this was most likely due to contamination during the sample preparation process. Zinc can be hard to measure in these conditions due zinc containing dust particles which can easily contaminate the samples (Murat Ardelan, personal communication).

6.2 Molybdenum

The chelex labile molybdenum concentration in the deeper water stays very low in all the treatments added more nutrients than natural concentration (figure 5.9). This is pronounced throughout the entire experiment and the only real fluctuations seen are in the control and natural treatments. In the surface water there are more discernible fluctuations also in the higher nutrient concentration treatments, although they generally have lower molybdenum concentrations than the control and natural treatments. At the end of the experiment there is a separation between high ammonium and low ammonium treatments, when assuming the last value for the natural treatment in surface water is erroneous. It suggests that higher ammonium concentrations lead to less chelex-labile molybdenum in the water. When comparing the chelex labile molybdenum in surface and deeper water (figure 5.9), it seems that the combined effect of an increasing biomass (figure 5.3) as well as a higher ammonium concentration has a larger effect in the deeper water than in the surface water. This suggests that the combined effect is either affecting DOM or biomass in such a way as to remove more of the dissolved molybdenum from the water. In the biogenic particulate molybdenum concentration (figure 5.11) there is no clear corresponding trend in the deeper water, so it’s not possible to conclude that the lower chelex labile molybdenum concentration in the high ammonium treatments is due to biomass uptake alone. The Mo/POC quota for the deeper water shows a higher content of molybdenum per g C in the lower ammonium treatments as the experiment progresses, but the same trend is in fact seen in the surface water, although there is no clear connection here to the chelex labile molybdenum concentration (figure 5.12).

The biggest difference in chelex and DGT samples for the molybdenum concentration is the large peak showing in the DGT results at the second sampling day in the deeper water (figure 5.10). This peak is evident for all treatments except the conc.1 treatment. The trends in the DGT labile molybdenum concentration in the high ammonium treatments in the later part of the experiment correspond better to the Chelex-100 samples, as it stays low. Although not very distinguishable in the figure, there is a rise in the DGT labile molybdenum concentration in the low ammonium treatments. The Tukey’s test done for the deeper water DGT results at the very end of the experiment (appendix table B13) shows that the main differences are found between natural/control and the higher nutrient concentrations treatments, suggesting that a rise in nutrient concentration will lead to a change in the DGT labile molybdenum concentration. This is supported by the linear regression done for the last sampling day (appendix table B14). It shows that there is a negative correlation between ammonium concentration and DGT labile molybdenum concentration, and that it is fair to predict a drop in DGT labile molybdenum concentration with increasing ammonium concentration (when the bloom has had time to grow). In the surface water there are only small fluctuations in the DGT labile molybdenum concentrations, and there is no clear trend relating to the ammonium concentration.

Higher biogenic particulate molybdenum concentrations in the conc. 1 and conc. 2 treatments in bothe surface and deeper water (figure 5.11), suggests that biological molybdenum removal under moderate and high ammonium flux is as effective as cadmium removal due to increased phytoplankton growth. Low DGT labile molybdenum concentrations (figure 5.10) also supports the fact that molybdenum has been effectively removed due to enhanced productivity under high ammonium flux. However, the biological accumulation is dramatically lower at the highest ammonium flux treatment, and this is supported by a very low Mo/POC quota for this fraction (figure 5.12)

Looking at the Mo/POC quota (figure 5.12), there is a significant reduction of molybdenum related to biomass in the higher ammonium treatments. In the deeper water the high nutrient treatments have a lower Mo content per g C from the second sampling day. In the surface water this trend is even more pronounced and the difference between the Mo/POC quota in the control and the higher nutrient addition treatments is even bigger. This trend in the Mo/POC quota, of higher molybdenum contend per C in the lower ammonium treatments suggests that somehow the biomass no longer needs as much molybdenum to support the biomass when ammonium is supplied in excess, or the molybdenum has been removed and become a limited micronutrient under high ammonium flux. Molybdenum has an enzymatic role in the reduction of NO_3^- to NO_2^- (which can then be further reduced to NH_4^+), as mentioned in section 3.5.3 (figure 3.9), and it might be expected that some groups of phytoplankton will need less molybdenum if they can utilize the shift in available nitrogen from NO_3^- to NH_4^+. Initially, the groups expected to favor this shift would be pico- and nanoplankton, as mentioned in section 3.4.1. When fractionated POC samples have been processed it could be possible to determine whether or not these groups have been the ones to utilize the shift better, and also whether this has caused them to decrease their cellular uptake of molybdenum due to a lessened need of molybdenum in nitrogen transformation processes when ammonium is supplied in excess. The large difference in Mo/POC quota between low and high ammonium treatments in the surface water could suggest that there are more organisms in this water type that are able to utilize the shift from nitrate to ammonium, and thus need less cellular molybdenum to support the biomass. However, this is hard to conclude without doing a fractionated Mo/POC study, as well as looking closer into the species found at the start and the end of the experiment, to see whether there in fact has been a shift in what species are growing more and utilizing the ammonium better.

The fractionation (figure 5.13) shows that molybdenum removal is generally most efficient in the bigger fractions in the deeper water. In the middle of the experiment, more molybdenum is found in the > 20 µm fraction in the lower ammonium treatments, while the two higher ammonium treatments accumulate molybdenum more in the largest size fraction, which is the one containing small zooplankton grazers. At the end of the experiment there seems to be a larger metal uptake in the largest size fraction especially in the conc. 1 treatment, suggesting that the grazing of phytoplankton by zooplankton has progressed further in this treatment than the others. The high concentrations of molybdenum in the larger size fractions could mean either that these organisms have utilized the shift form nitrate to ammonium well, growing in biomass and thus showing an increased molybdenum concentration due to the sheer size of the biomass in the fraction. Another possibility is that the fractions do not utilize the shift well, and thus have a higher need for molybdenum per cell as they would need the molybdenum in enzymatic transformations of nitrogen. In the surface water the molybdenum concentration is generally lower in all fractions than in the deeper water, and the concentrations in the smaller size fractions are higher relative to the larger size fraction here than in the deeper water. However, at the end of the experiment there is a larger molybdenum concentration in the largest size fraction in the conc. 1 treatment as in the deeper water. The highest ammonium treatment is at the end of the experiment higher in molybdenum concentration in the two smallest size fractions. As this is the fraction containing the organisms that initially would be expected to take up less molybdenum as a result being able to utilize the ammonium addition (Glibert, et al., 1982b, Wafar, et al., 2004), this could mean that this fraction has grown enough in biomass that even though there is a decreased uptake of molybdenum on a cellular level, the total concentration of molybdenum in the fraction increases. This would mean that it is not a higher uptake per g C that is the reason for the increase in the particulate molybdenum concentration in these fractions. As there is no POC fractionation data available yet however, no conclusion can be made.

The concentrations of molybdenum found in this experiment are low compared to values for concentration of molybdenum in natural waters found in literature (although molybdenum concentrations have been reported as low as ~1 nM in natural waters (Marino, et al., 1990, Howarth, et al., 1988, Collier, 1985). One reason for this might be that the iminodiacetate group in the Chelex-100 resin is not able to retain all molybdenum present in the water sample. A study done by Lee et al (2002) employed an iminodiacetate type resin, and this showed only a 20 % recovery of molybdenum in an artificial seawater sample although the metal elution was almost complete. The low recovery in their study was therefore concluded to be due to poor adsorption efficiency. Although a different resin was used in our experiment, the chelating groups, i.e. the iminodiacetate groups, are the same in both resins and the problem of adsorption efficiency might also be applicable in our case. If this is the case, the values presented in the result section are only around 20 % of the true concentration. Another study, done by (Greenberg and Kingston, 1983), found that the ammonium buffer retained considerable amounts of molybdenum before acid elution, and hence reduced the amount of molybdenum in the final sample for analysis. Both low adsorption and buffer elution give possibilities for obtaining wrongly low molybdenum concentrations. This does not however affect the trends present in the data, as the adsorption efficiency should create a constant relative error throughout the measurements.

6.3 Nickel

The chelex labile nickel concentration (figure 5.14) has an increase at the start of the experiment in the marine water, a trend that is not repeated in the DGT results (figure 5.15). Where there is a slight decrease in the chelex labile nickel concentration at the end of the experiment, the reverse is true for the DGT labile nickel concentration. Both chelex labile and DGT labile nickel concentration, despite fluctuations, end up with a slight separation between the high ammonium and the low ammonium treatments at the end of the experiment; the high ammonium treatments showing a lower nickel concentration. This suggests that the high ammonium flux is causing nickel to be removed from the water in chelex and DGT labile forms, and instead being bound to particles or being taken up in biomass.

For DGT labile nickel concentration in deeper water, the biggest differences found between treatments at the end are between control and the higher nutrient concentration treatments, and between the natural and the conc. 3 treatment, according to the Tukey’s test (appendix table B21). In the surface water the differences are found between control/natural and the two highest nutrient concentration treatments. A linear regression shows that the DGT labile nickel concentration is negatively related to the nutrient concentration (appendix table B22). The R^2 values make it fair to predict a decreasing nickel concentration as nutrient concentrations rise in both marine and surface water.

The negative correlation between nickel concentration and nutrient concentration is supported by the work done by Luoma et al (1998). A study done in the South San Fransisco bay showed that during a spring bloom, nickel concentration was reduced to 75 % of its prebloom concentration. At the same time the nickel concentration in phytoplankton was found to have increased greatly, in fact to a much greater degree than the decrease in dissolved nickel concentration. This was explained by increased resuspended sediment, adding substantial amounts of nickel to the water column. A similarly great increase in phytoplankton uptake of Ni could therefore not be expected in our experiment, as no excess nickel was available neither from sediment nor through artificial additions.

The biogenic particulate nickel concentration (figure 5.16) in deeper water is higher in the conc. 1 and conc. 2 treatments as the experiment progresses. The control and the natural treatments both have low nickel concentration in particles throughout the experiment. In the surface water the conc. 2 and conc. 3 treatments are the ones with the higher nickel concentrations. At the very last day the conc. 1 treatment also shows a high nickel concentration in particles. Again there are low nickel concentrations in the control and natural treatments, although the difference between low nutrient and high nutrient treatments is not as pronounced as in the deeper water. The Tukey's test done for the two last sampling days shows that the only significant differences are found between control/natural and the conc. 2 treatment in the deeper water (appendix table B23). The linear regression done for the two last sampling days was only significant for the surface water filtration, showing a positive correlation between nutrient concentration and nickel concentration in particles (appendix table B24). Both surface and deeper water does show a visual tendency towards a removal of nickel by biomass when ammonium concentrations are high, although this is not completely backed up by statistical analyses.

Looking at the Ni/POC quotas (figure 5.17), the trends are quite the opposite of the simple biogenic particulate concentration. In both deeper and surface water the Ni/POC quota is higher at the start of the experiment than at the end. This is true for all treatments. In the deeper water the quota is much lower, and quite similar in the different treatments even from the second sampling day. In the surface water the quota is higher in the lower nutrient concentration treatments in the middle of the experiment, but at the end the differences between the treatments is very small. In general it doesn't seem like the nickel uptake per g C is depending in any great degree on the addition of ammonium. Taking this into account, the high biogenic particulate concentrations of nickel in the high ammonium treatments could therefore be due to a simple increase in biomass.

The fractionation (figure 5.18) shows generally very little variation in the way the nickel is distributed between the different size fractions, although there seems to be somewhat higher concentrations in the smaller size fractions. The only two exceptions are the two highest ammonium treatments in deeper water in the middle of the experiment. Here there is much higher concentrations in all fractions. In the conc. 3 treatment the three smallest size fractions all stand out with a high nickel contend, while in the conc. 2 treatment the smallest, the > 10 µm and the > 20 µm fractions are the ones to stand out. Without the fractionated POC data this is hard to conclusively explain, but it is at the point in the experiment where the biomass is at its highest, which could mean that these high nickel concentrations simply is due to the fact that most of the fractions are increasing in biomass. The fact that the smaller fractions, i.e.the ones expected to utilize the nitrate to ammonium shift (Glibert, et al., 1982b, Wafar, et al., 2004) are the ones to increase the most in nickel concentration can be a further point to support this suggestion.

6.4 Copper

In the deeper water, there seems to be very little variation in the chelex labile copper concentration (figure 5.19), although there is a slight separation at the end, where chelex labile concentrations are higher in the low ammonium treatments. This however could not be supported by statistics, suggesting that the nutrient additions are not affecting the chelex labile copper concentration very much. The surface water also shows small variations in time and between treatments, but the control treatment stands out with a both a longer lasting downward trend from the start to the middle of the experiment, and a larger increase in concentration at the very end. This could be due to a method problem, or possibly contamination for the last sampling point.

In the deeper water there is a general trend of decreasing DGT labile copper concentration (figure 5.20) as the experiment progresses (after an initial peak). The treatment differing most from this trend is the conc. 2 treatment which, instead of peaking at the second sampling day, peaks at the fourth sampling. Although the trend throughout the experiment is different for this treatment, it ends up at a final copper concentration close to that in the other treatments. As a whole, it doesn’t give any impression that the enrichment has any real effect on the DGT labile concentration, as the initial and final concentrations are very similar and copper concentrations are quite similar in the different treatments. In the surface water there trend is much more linear, and there is little difference between the treatments. The Tukey’s test (appendix table B26) however, finds significant differences between the lower nutrient concentration treatments (control and natural) and the high concentration ones in the deeper water. The control treatment is significantly different from all high nutrient treatment, while natural is significantly different from the two highest nutrient concentration treatments. In the surface water there is only a significant difference between the conc.1 and the conc. 2 treatments. The Tukey's test is done for the two last days of the experiment, and thus says nothing about the way the treatments vary over time. The linear regression (appendix table B27) shows that there is a decline in copper concentration with increasing nutrient concentration. This analysis was also done for the last two sampling days, and thus gives a picture of what happens after the bloom has had time to grow. The fact that the statistical analysis suggests that a decreasing copper concentration in the water can be expected with increasing nutrient additions (although it is quite to pick up from the figure) is contrary to what was found by Luoma et al (1998). They found that during a phytoplankton bloom, the dissolved Cu concentration in the water column increased with 20 % compared to prebloom conditions. There is an initial increase of DGT labile copper concentration in the deeper water in our experiment, but this is not the case when the bloom has had time to grow. The bloom studied by Luoma et al. was a natural one, and there were possibilities of input of copper from sediments as well as biomass, and so it is hard to say whether our results are conflicting or whether the mechanisms causing the increasing dissolved copper concentration in the natural bloom are missing from our artificially created environment.

The biogenic particulate copper concentration (figure 5.21) is highest in the conc. 2 treatment in the deeper water, followed by the conc. 1 and conc. 3 treatments, showing that the increased ammonium flux does increase particulate copper concentrations. However, comparing these results to the Cu/POC quota (figure 5.22), the trend is not the same. Although the copper concentration per g C is high in the conc. 2 treatment on the first day, it decreases greatly already at the second sampling day. This is true for all treatments, except for the control which rises again at the very end. The biogenic particulate copper concentrations do seem to be higher in the higher nutrient concentration treatments, but the one-way ANOVA (appendix table B32) showed no significant differences between the treatments at the end of the experiment. The Cu/POC graph makes it quite clear that the ammonium additions do not affect copper uptake on a cellular level, as the concentration in the different treatments are quite similar throughout the experiment (this is supported by the lack of significant differences at the end of the experiment, as found by a one-way ANOVA). It also suggests that as time goes on, and the bloom progresses, the biomass take up less copper per g C. The fact that there are higher biogenic particulate concentrations in the higher ammonium treatments seem thus to be due to the fact that these treatments have a higher biomass.

In the surface water, the trend is similar to the deeper water, where biogenic particulate copper concentrations are mostly higher in the higher nutrient concentration treatments (figure 5.21). Again, comparing to the Cu/POC quota (FIGURE 5.22), the actual amount of copper per g C does decrease after the first day of sampling, and the quota is lower for the high nutrient concentration treatments. However, a one-way ANOVA followed by a Tukey's test reveals that there are few significant differences between treatments at the end of the experiment (appendix table B30). The only two treatments to show any significant difference from the control at the end of the experiment are the conc. 1 and conc. 3 treatments. The natural treatment has no significant differences form the high nutrient concentration treatments. The aforementioned study done by Luoma et al (1998) also looked at copper uptake by phytoplankton during nutrient enriched conditions. The study could find no effect of the nutrient enrichment on copper uptake in phytoplankton. Although they did find an increased concentration of copper in particles, this was concluded to be due to resuspension from sediments. In our closed mesocosm systems, this is not an option and thus we could not expect a similar rise in copper concentrations in particles. Although the statistics do not support the visual observation that biogenic particulate copper concentrations are lower per g C in the higher ammonium treatments compared to natural conditions (appendix table B30), it is still worth looking into. The statistical analyses were only done for the last two sampling days, and the natural treatment has a decline in Cu/POC at the very end, while in the middle of the experiment it is much closer to the control, and several times higher than the high ammonium treatments. This does suggest that in the surface water the organisms somehow has a lesser need for copper when ammonium supply is high, as there is still copper available in the water (figures 5.19 and 5.20) and thus the low Cu/POC quota (figure 5.22) should not be due to low available copper concentrations. Although copper has no known role in the reduction of nitrate or nitrite, there is the possibility that the shift from nitrate to ammonium, and the energy saving characteristic of this shift could also affect other processes within the cell. As copper is active in other enzyme, e.g. in photosynthetic processes (Stumm and Morgan, 1996), there is some chance that these processes are somehow also affected by the nutrient enrichment.

The fractionation data (figure 5.23) for the deeper water shows that the greatest concentration of copper is found in the > 2 µm fraction in the highest nutrient concentration, in the middle of the experiment. Generally there seems to be higher copper concentrations in the smaller organisms (the two smallest size fractions). As fractionated POC data does not exist, it is hard to speculate on how this copper is distributed within the fraction. Reasons for this high concentration can be both a high cell count (little change in Cu/POC quota) and a higher copper uptake per particle (increasing Cu/POC quota).

In the surface water (figure 5.23), there seems to be a high copper concentration in the smallest fraction (> 0.2 µm) in several treatments throughout the experiment. This might be because this size fraction experiences increased biomass growth, or it might be caused by a higher copper uptake in each cell. This fraction contains some of the organisms expected to be able to utilize the nitrate to ammonium shift better (Glibert, et al., 1982b, Wafar, et al., 2004) and thus it is prudent to think that the increase in copper concentration could be due to a biomass increase caused by the utilizing of this shift. At the middle of the experiment the > 140 µm fraction also increases quite much in the highest nutrient concentration treatment, perhaps due to a more effective grazing by zooplankton at the peak of the bloom (figure 5.3) Again, exactly how the increase in concentration is related to the biomass can be assessed further when fractionated POC data is available.

7 Conclusion

Enrichment by ammonium (as well as other macronutrients) caused an increase in biomass. Particulate concentrations of all metals considered (Cd, Mo, Ni and Cu) increased when ammonium was added, due to the increasing biomass. There was a general trend of decreasing chelex and DGT labile metal concentrations with higher ammonium flux. Exceptions were chelex labile copper concentrations and DGT labile molybdenum concentrations in surface water.

The distribution of metals in different size fractions of particles showed that cadmium and molybdenum generally could be found in the larger fractions, while copper and nickel concentrations were generally highest in the smaller fractions.

In the deeper water the Cd/POC quota was highest when ammonium concentrations correspond to a realistic aquaculture enrichment scenario. When the ammonium flux was higher than this, a reduced uptake of cadmium per g C could be observed, suggesting some kind of inhibition of cadmium uptake under the ammonium enriched conditions.

The joint influence of a high ammonium flux and high biomass affected chelex labile molybdenum concentration in the deeper water more than in the surface water. In the deeper water there was much more pronounced differences between high and low ammonium treatments; chelex labile molybdenum concentrations being lower in high ammonium treatments. Mo/POC quota decreased with increasing ammonium flux in deeper water, indicating the biomass has a decreased need for molybdenum when ammonium concentrations are high. Uptake of copper and nickel on a g C basis (Metal/POC quota) was not markedly affected by ammonium flux in the deeper water.

In surface water both the Mo/POC quota as well as the Cu/POC quota decreased with higher ammonium flux. For molybdenum this suggests a decreased need for cellular molybdenum due to the shift from nitrate to ammonium and the role molybdenum has in enzymatic nitrogen transformations. Ni/POC and Cd/POC quotas were not markedly affected by ammonium flux in the surface water.

8 Further work

Firstly, there are many questions that can be addressed by looking at the fractionated POC results when these are ready. This will give a better general knowledge of how the biomass evolved throughout the experiment, as well as presenting the option of doing normalization against the metal concentrations in the size fractionated particles. These results will make it possible to study how the metal uptake changes within the different size fractions on a g C basis with an increasing ammonium flux. This especially interesting where the metal/POC quota for the metal in question has been found to be affected by the ammonium flux, as it will give a chance to see which organism groups experience the greatest change.

The results showing that there seems to be some kind of limitation of cadmium uptake by biomass under high ammonium flux are also quite interesting, and this could be studied further by doing experiments targeted towards cadmium uptake. This could be done as a joint study of cadmium, cobalt and zinc as these three metals are linked in enzymatic processes. An option would also be to do studies where the metals are added along with macronutrients, to study the possibility of an inhibition of cadmium uptake and toxicity that was observed at high ammonium concentrations.

The decrease in Mo/POC quota with increasing ammonium flux is also a result that would be interesting to study further. The suggestions that this is due to a decreased of molybdenum when nitrogen is present as ammonium instead of nitrate could be better answered by a study of enzymatic mechanisms in the cell under these conditions.

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APPENDIX

List of appendices

APPENDIX A: Thermo Finnigan Element 2 instrument conditions

Parameter	**Value**
Sample flow/pumping speed	250 µL
Sample loop	Concentration analysis: 300 µL Isotope ratio measurement: 500 µL

Equipment	**Type**
Nebulizer	PFA-ST with approx. volume range from 50-700µl/min
Spray chamber	PFA Barrel 35mm, dedicated for sample flow < 0,5ml/min
Torch	Demountable
Injector	Quarts
Sample and skimmer cones	Aluminium
X-skimmer cones	Aluminium

Gas flows	**Value**
Cooling gas	15,5 L/min
Auxiliary gas	approx. 0.8 L/min
Sample gas	approx. 0.9 L/min
Additional gas	approx 0.0004 CH4 L/min, corresponds to approx. 0.04% of the sample gas

Determination	**Value**
Resolutions	Low (400), medium (5500) and high - 10000

APPENDIX B: Statistical tables

All means, standard deviations and relative standard deviations for parallel samples are presented in this appendix. Summary tables for Tukey's tests with p >0.05 as well as summaries for all linear regressions done are also presented here. Lastly tables with values from the one-way ANOVA are presented.

Table B1: Means, standard deviations and relative standard deviations for river samples of DGT-labile metals

Metal	Sample	Mean	St.dev	RSD %
Cd	River 0 PSU	0,021	0,001	4,5
	River 5 PSU	0,020	0,001	5,2
	River 7 PSU	0,037	0,003	7,5
Mo	River 0 PSU	0,89	0,054	6,1
	River 5 PSU	0,11	0,005	4,6
	River 7 PSU	0,96	0,092	9,6
Ni	River 0 PSU	7,72	0,054	0,7
	River 5 PSU	24,9	0,859	3,5
	River 7 PSU	4,03	0,130	3,2
Cu	River 0 PSU	0,15	0,065	43,9
	River 5 PSU	0,09	0,030	35,5
	River 7 PSU	0,44	0,273	62,8

Table B2: Means, standard deviations and relative standard deviations for depth samples of DGT-labile metals

Metal	Sample	Mean	St.dev	RSD %
Cd	Depth 0	0,037	0,003	7,5
	Depth 10	0,24	0,006	2,4
	Depth 30	0,33	0,006	1,8
	Depth 50	0,34	0,017	5,0
	Depth 70	0,37	0,013	3,6
Mo	Depth 0	0,96	0,092	9,6
	Depth 10	0,94	0,113	12,0
	Depth 30	0,95	0,127	13,4
	Depth 50	0,83	0,114	13,7
	Depth 70	0,91	0,041	4,5
Ni	Depth 0	4,03	0,130	3,2
	Depth 10	5,60	0,236	4,2
	Depth 30	6,33	0,146	2,3
	Depth 50	9,04	1,670	18,5
	Depth 70	9,62	0,226	2,3
Cu	Depth 0	0,44	0,273	62,8
	Depth 10	0,36	0,043	11,7
	Depth 30	0,37	0,040	10,8
	Depth 50	0,61	0,019	3,1
	Depth 70	0,29	0,061	21,3

Table B3: Linear regression Chelex-labile Cadmium

Sample	Water type	P/D	Metal	R^2	P	Slope
Chelex	Deeper	D	Cd	0.558	0.013	-0.747
Chelex	Surface	D	Cd	1.41E-05	0.992	0.004

Table B4: Means, standard deviations and relative standard deviation for DGT-labile Cadmium

Metal	Date	Treatment	Mean	St.dev	RSD %	Metal	Date	Treatment	Mean	St.dev	RSD %
Cd	23.01.2011	Control	0,566	0,050	8,8	**Cd**	24.01.2011	Control	0,334	0,054	16,3
Deeper	26.01.2011	Control	0,503	0,095	19,0	**Surface**	27.01.2011	Control	0,238	0,006	2,5
	04.02.2011	Control	0,224	0,022	10,0		05.02.2011	Control	0,313	0,051	16,4
	13.02.2011	Control	0,168	0,022	12,8		14.02.2011	Control	0,273	0,024	8,9
	23.01.2011	Natural	0,566	0,050	8,8		24.01.2011	Natural	0,334	0,054	16,3
	26.01.2011	Natural	0,396	0,024	6,1		27.01.2011	Natural	0,267	0,015	5,6
	04.02.2011	Natural	0,194	0,017	8,6		05.02.2011	Natural	0,274	0,007	2,4
	13.02.2011	Natural	0,164	0,012	7,2		14.02.2011	Natural	0,306	0,012	4,0
	23.01.2011	Conc. 1	0,566	0,050	8,8		24.01.2011	Conc. 1	0,334	0,054	16,3
	26.01.2011	Conc. 1	0,265	0,038	14,5		27.01.2011	Conc. 1	0,165	0,003	1,8
	04.02.2011	Conc. 1	0,198	0,032	16,1		05.02.2011	Conc. 1	0,156	0,014	8,9
	13.02.2011	Conc. 1	0,216	0,016	7,4		14.02.2011	Conc. 1	0,181	0,009	5,2
	23.01.2011	Conc. 2	0,566	0,050	8,8		24.01.2011	Conc. 2	0,334	0,054	16,3
	26.01.2011	Conc. 2	0,216	0,002	0,9		27.01.2011	Conc. 2	0,213	0,009	4,3
	29.01.2011	Conc. 2	0,153	0,003	2,3		30.01.2011	Conc. 2	0,224	0,019	8,4
	04.02.2011	Conc. 2	0,127	0,027	21,0		05.02.2011	Conc. 2	0,073	0,004	5,0
	13.02.2011	Conc. 2	0,063	0,007	10,7		14.02.2011	Conc. 2	0,074	0,002	3,3
	23.01.2011	Conc. 3	0,566	0,050	8,8		24.01.2011	Conc. 3	0,334	0,054	16,3
	26.01.2011	Conc. 3	0,074	0,010	13,6		27.01.2011	Conc. 3	0,122	0,019	16,0
	29.01.2011	Conc. 3	0,209	0,044	21,1		30.01.2011	Conc. 3	0,078	0,000	0,0
	04.02.2011	Conc. 3	0,035	0,004	12,4		05.02.2011	Conc. 3	0,043	0,004	10,5
	13.02.2011	Conc. 3	0,054	0,005	10,2		14.02.2011	Conc. 3	0,038	0,005	13,0

Table B5: Tukey's test DGT-labile Cadmium

Sample	Water type	Treatments	Metal	P value
DGT	Deeper	Conc. 1 vs. conc. 3	Cd	< 0.0001
DGT	Deeper	Conc. 1 vs. conc. 2	Cd	< 0.0001
DGT	Deeper	Conc. 1 vs. natural	Cd	0.023
DGT	Deeper	Conc. 1 vs. control	Cd	0.037
DGT	Deeper	Control vs. conc. 3	Cd	< 0.0001
DGT	Deeper	Control vs. conc. 2	Cd	0.0001
DGT	Deeper	Natural vs. conc. 3	Cd	< 0.0001
DGT	Deeper	Natural vs. conc. 2	Cd	0.0002
DGT	Surface	Natural vs. conc. 3	Cd	< 0.0001
DGT	Surface	Natural vs. conc. 2	Cd	< 0.0001
DGT	Surface	Natural vs. cons. 1	Cd	< 0.0001
DGT	Surface	Control vs. conc. 3	Cd	< 0.0001
DGT	Surface	Control vs. conc. 2	Cd	< 0,0001
DGT	Surface	Control vs. conc. 1	Cd	0.001
DGT	Surface	Conc. 1 vs. conc. 3	Cd	< 0.0001
DGT	Surface	Conc. 1 vs. conc. 2	Cd	0.0002

Table B6: Linear regression DGT-labile Cadmium

Sample	Water type	Metal	R^2	P	Slope
DGT	Deeper	Cd	0.853	< 0.0001	-0.924
DGT	Surface	Cd	0.905	< 0.0001	-0.951

Table B7: Tukey's test filtration Cadmium

Sample	Water type	Treatments	Metal	p
Filtration	Deeper	Conc. 1 vs. control	Cd	0.017
Filtration	Deeper	Conc. 1 vs. natural	Cd	0.018

Table B8: Linear regression filtration Cadmium

Sample	Water type	Metal	R^2	p	Slope
Filtration	Deeper	Cd	0.069	0.462	0.264
Filtration	Surface	Cd	0.441	0.036	0.664

Table B9: Tukey's test normalization Cadmium

Sample	Water type	Treatments	Metal	P value
Normalization	Deeper	Natural vs. conc. 1	Cd	0.016
Normalization	Deeper	Control vs. conc. 1	Cd	0.033
Normalization	Deeper	Conc. 1 vs. conc. 3	Cd	0.043

Table B10: Linear regression normalization Cadmium

Sample	Water type	Metal	R^2	P	Slope
Normalization	Deeper	Cd	0.000005	0.995	0.002
Normalization	Surface	Cd	0.008	0.807	0.089

Table B11: Linear regression chelex-labile Molybdenum

Sample	Water type	P/D	Metal	R^2	p	Slope
Chelex	Deeper	D	Mo	0.671	0.004	-0.819
Chelex	Surface	D	Mo	0.138	0.291	-0.371

Table B12: Means, standard deviations and relative standard deviation for DGT-labile Molybdenum

Metal	Date	Treatment	Mean	St.dev	RSD %	Metal	Date	Treatment	Mean	St.dev	RSD %
Mo	23.01.2011	Control	1,25	0,27	21,5	**Mo**	24.01.2011	Control	1,15	0,24	21,0
Deeper	26.01.2011	Control	21,06	1,28	6,1	**Surface**	27.01.2011	Control	1,53	0,15	9,7
	04.02.2011	Control	1,61	0,31	19,4		05.02.2011	Control	0,78	0,04	5,5
	13.02.2011	Control	2,13	0,12	5,4		14.02.2011	Control	1,53	0,15	9,7
	23.01.2011	Natural	1,25	0,27	21,5		24.01.2011	Natural	1,15	0,24	21,0
	26.01.2011	Natural	27,45	0,80	2,9		27.01.2011	Natural	1,42	0,09	6,1
	04.02.2011	Natural	1,71	0,14	8,4		05.02.2011	Natural	0,77	0,02	2,9
	13.02.2011	Natural	1,54	0,21	13,6		14.02.2011	Natural	2,02	0,29	14,4
	23.01.2011	Conc. 1	1,25	0,27	21,5		24.01.2011	Conc. 1	1,15	0,24	21,0
	26.01.2011	Conc. 1	1,90	0,28	14,6		27.01.2011	Conc. 1	1,50	0,00	0,0
	04.02.2011	Conc. 1	1,18	0,17	14,2		05.02.2011	Conc. 1	0,73	0,09	11,8
	13.02.2011	Conc. 1	1,00	0,12	11,9		14.02.2011	Conc. 1	2,12	0,14	6,6
	23.01.2011	Conc. 2	1,25	0,27	21,5		24.01.2011	Conc. 2	1,15	0,24	21,0
	26.01.2011	Conc. 2	10,31	0,30	2,9		27.01.2011	Conc. 2	1,38	0,21	15,6
	29.01.2011	Conc. 2	0,62	0,11	16,9		30.01.2011	Conc. 2	0,66	0,14	21,0
	04.02.2011	Conc. 2	0,93	0,16	17,6		05.02.2011	Conc. 2	0,63	0,13	19,9
	13.02.2011	Conc. 2	0,93	0,21	22,5		14.02.2011	Conc. 2	1,08	0,13	11,7
	23.01.2011	Conc. 3	1,25	0,27	21,5		24.01.2011	Conc. 3	1,15	0,24	21,0
	26.01.2011	Conc. 3	59,25	3,80	6,4		27.01.2011	Conc. 3	1,44	0,18	12,6
	29.01.2011	Conc. 3	0,67	0,00	0,0		30.01.2011	Conc. 3	0,82	0,00	0,0
	04.02.2011	Conc. 3	0,97	0,08	8,1		05.02.2011	Conc. 3	0,50	0,03	6,1
	13.02.2011	Conc. 3	0,91	0,06	6,3		14.02.2011	Conc. 3	2,10	0,37	17,6

Table B13: Tukey's test DGT-labile Molybdenum

Sample	Water type	Treatments	Metal	P value
DGT	Deeper	Control vs. conc. 3	Mo	< 0.0001
DGT	Deeper	Control vs. conc. 2	Mo	0.0001
DGT	Deeper	Control vs. conc. 1	Mo	0.0002
DGT	Deeper	Control vs. natural	Mo	0.020
DGT	Deeper	Natural vs. conc. 3	Mo	0.014
DGT	Deeper	Natural vs. conc. 2	Mo	0.018
DGT	Deeper	Natural vs. conc. 1	Mo	0.035
DGT	Surface	Conc. 1 vs. conc. 2	Mo	0.012
DGT	Surface	Conc. 3 vs. conc. 2	Mo	0.025
DGT	Surface	Natural vs. conc. 2	Mo	0.021

Table B14: Linear regression DGT-labile Molybdenum

Sample	Water type	Metal	R^2	P	Slope
DGT	Deeper	Mo	0.574	0.001	-0.758
DGT	Surface	Mo	0.084	0.295	-0.290

Table B15: Tukey's test filtration Molybdenum

Sample	Water type	Treatment	Metal	p
Filtration	Deeper	Conc. 1 vs. conc. 3	Mo	0.009
Filtration	Deeper	Conc. 1 vs. control	Mo	0.012

Table B16: Linear regression filtration Molybdenum

Sample	Water type	Metal	R^2	p	Slope
Filtration	Deeper	Mo	0.100	0.374	-0.316
Filtration	Surface	Mo	0.080	0.428	-0.283

Table B17: Tukey's test normalization Molybdenum

Sample	Water type	Treatments	Metal	p value
Normalization	Deeper	Natural vs. conc. 3	Mo	0.006
Normalization	Deeper	Natural vs. conc. 2	Mo	0.018
Normalization	Deeper	Control vs. conc. 3	Mo	0.007
Normalization	Deeper	Control vs. conc. 2	Mo	0.020
Normalization	Deeper	Conc.1 vs. conc. 3	Mo	0.015
Normalization	Deeper	Conc. 1 vs. conc. 2	Mo	0.049
Normalization	Surface	Control vs. conc. 3	Mo	0.0002
Normalization	Surface	Control vs. conc. 2	Mo	0.0003
Normalization	Surface	Control vs. conc. 1	Mo	0.0004
Normalization	Surface	Control vs. natural	Mo	0.001
Normalization	Surface	Natural vs. conc. 3	Mo	0.016

Table B18: Linear regression normalization Molybdenum

Sample	Water type	Metal	R^2	p	Slope
Normalization	Deeper	Mo	0.910	< 0.0001	-0.954
Normalization	Surface	Mo	0.571	0.012	-0.755

Table B19: Linear regression chelex-labile Nickel

Sample	Water type	P/D	Metal	R^2	P	Slope
Chelex	Deeper	D	Ni	0.149	0.271	-0.386
Chelex	Surface	D	Ni	0.119	0.329	-0.345

Table B20: Means, standard deviations and relative standard deviations chelex-labile Nickel

Metal	Date	Treatment	Mean	St.dev	RSD %	Metal	Date	Treatment	Mean	St.dev	RSD %
Ni	23.01.2011	Control	5,57	0,761	13,6	**Ni**	24.01.2011	Control	21,29	2,82	13,2
Deeper	26.01.2011	Control	9,08	0,606	6,7	**Surface**	27.01.2011	Control	3,32	0,17	5,0
	04.02.2011	Control	3,92	0,492	12,5		05.02.2011	Control	5,78	0,93	16,1
	13.02.2011	Control	7,77	0,205	2,6		14.02.2011	Control	8,31	0,69	8,2
	23.01.2011	Natural	5,57	0,761	13,6		24.01.2011	Natural	21,29	2,82	13,2
	26.01.2011	Natural	4,82	0,389	8,1		27.01.2011	Natural	3,53	0,27	7,5
	04.02.2011	Natural	3,35	0,370	11,1		05.02.2011	Natural	5,58	0,23	4,2
	13.02.2011	Natural	7,48	0,168	2,2		14.02.2011	Natural	8,64	0,35	4,1
	23.01.2011	Conc. 1	5,57	0,761	13,6		24.01.2011	Conc. 1	21,29	2,82	13,2
	26.01.2011	Conc. 1	6,47	0,309	4,8		27.01.2011	Conc. 1	4,14	0,01	0,2
	04.02.2011	Conc. 1	5,97	0,871	14,6		05.02.2011	Conc. 1	5,32	0,30	5,7
	13.02.2011	Conc. 1	6,88	0,051	0,7		14.02.2011	Conc. 1	6,71	1,28	19,1
	23.01.2011	Conc. 2	5,57	0,761	13,6		24.01.2011	Conc. 2	21,29	2,82	13,2
	26.01.2011	Conc. 2	4,04	0,395	9,8		27.01.2011	Conc. 2	3,82	0,06	1,6
	29.01.2011	Conc. 2	2,71	0,178	6,6		30.01.2011	Conc. 2	2,33	0,00	0,0
	04.02.2011	Conc. 2	7,97	0,994	12,5		05.02.2011	Conc. 2	4,54	0,24	5,3
	13.02.2011	Conc. 2	6,74	0,509	7,6		14.02.2011	Conc. 2	5,21	0,18	3,5
	23.01.2011	Conc. 3	5,57	0,761	13,6		24.01.2011	Conc. 3	21,29	2,82	13,2
	26.01.2011	Conc. 3	5,06	0,874	17,3		27.01.2011	Conc. 3	3,75	0,08	2,3
	29.01.2011	Conc. 3	6,84	0,000	0,0		30.01.2011	Conc. 3	1,42	0,00	0,0
	04.02.2011	Conc. 3	5,02	0,551	11,0		05.02.2011	Conc. 3	4,20	0,10	2,4
	13.02.2011	Conc. 3	6,40	0,069	1,1		14.02.2011	Conc. 3	4,57	0,22	4,8

Table B21: Tukey's test DGT-labile Nickel

Sample	Water type	Treatments	Metal	p value
DGT	Deeper	Control vs. conc. 3	Ni	0.002
DGT	Deeper	Control vs. conc. 2	Ni	0.017
DGT	Deeper	Control vs. conc. 1	Ni	0.040
DGT	Deeper	Natural vs. conc. 3	Ni	0.013
DGT	Surface	Natural vs. conc. 3	Ni	0.001
DGT	Surface	Natural vs. conc. 2	Ni	0.004
DGT	Surface	Control vs. conc. 3	Ni	0.002
DGT	Surface	Control vs. conc. 2	Ni	0.007

Table B22: Linear regression DGT-labile Nickel

Sample	Water type	Metal	R^2	P value	Slope
DGT	Deeper	Ni	0,678	0,0002	-0,823
DGT	Surface	Ni	0,848	< 0,0001	-0,921

Table B23: Tukey's test filtration Nickel

Sample	Water type	Treatments	Metal	p
Filtration	Deeper	Conc. 2 vs. natural	Ni	0.020
Filtration	Deeper	Conc. 2 vs. control	Ni	0.020

Table B24: Linear regression filtration Nickel

Sample	Water type	Metal	R^2	p	Slope
Filtration	Deeper	Ni	0.244	0.146	0.494
Filtration	Surface	Ni	0.736	0.001	0.858

Table B25: Linear regression normalization Nickel

Sample	Water type	Metal	R^2	p	Slope
Normalization	Deeper	Ni	0.036	0.602	-0.189
Normalization	Surface	Ni	0.071	0.458	-0.266

Table B26: Mean, standard deviation and relative standard deviation DGT-labile Copper

Metal	Date	Treatment	Mean	St.dev	RSD %	Metal	Date	Treatment	Mean	St.dev	RSD %
Cu	23.01.2011	Control	1,76	0,32	18,3	**Cu**	24.01.2011	Control	2,25	0,51	22,5
Deeper	26.01.2011	Control	9,28	0,65	7,1	**Surface**	27.01.2011	Control	1,07	0,05	4,4
	04.02.2011	Control	1,49	0,08	5,4		05.02.2011	Control	1,27	0,23	18,2
	13.02.2011	Control	1,05	0,05	4,8		14.02.2011	Control	0,98	0,18	18,2
	23.01.2011	Natural	1,76	0,32	18,3		24.01.2011	Natural	2,25	0,51	22,5
	26.01.2011	Natural	5,32	0,26	5,0		27.01.2011	Natural	1,57	0,24	15,1
	04.02.2011	Natural	1,21	0,09	7,4		05.02.2011	Natural	0,99	0,06	5,7
	13.02.2011	Natural	0,85	0,07	8,0		14.02.2011	Natural	1,03	0,22	21,1
	23.01.2011	Conc. 1	1,76	0,32	18,3		24.01.2011	Conc. 1	2,25	0,51	22,5
	26.01.2011	Conc. 1	5,36	1,25	23,3		27.01.2011	Conc. 1	0,76	0,11	14,2
	04.02.2011	Conc. 1	1,42	0,01	1,0		05.02.2011	Conc. 1	0,91	0,04	4,5
	13.02.2011	Conc. 1	0,75	0,04	5,5		14.02.2011	Conc. 1	1,65	0,21	12,7
	23.01.2011	Conc. 2	1,76	0,32	18,3		24.01.2011	Conc. 2	2,25	0,51	22,5
	26.01.2011	Conc. 2	1,26	0,29	23,1		27.01.2011	Conc. 2	0,67	0,04	6,0
	29.01.2011	Conc. 2	2,07	0,00	0,0		30.01.2011	Conc. 2	0,67	0,00	0,0
	04.02.2011	Conc. 2	3,11	0,12	3,9		05.02.2011	Conc. 2	1,05	0,21	20,4
	13.02.2011	Conc. 2	0,62	0,09	13,9		14.02.2011	Conc. 2	0,76	0,10	12,7
	23.01.2011	Conc. 3	1,76	0,32	18,3		24.01.2011	Conc. 3	2,25	0,51	22,5
	26.01.2011	Conc. 3	5,03	0,77	15,4		27.01.2011	Conc. 3	0,57	0,06	10,6
	29.01.2011	Conc. 3	3,36	0,00	0,0		30.01.2011	Conc. 3	0,61	0,00	0,0
	04.02.2011	Conc. 3	0,94	0,14	15,0		05.02.2011	Conc. 3	0,72	0,13	17,4
	13.02.2011	Conc. 3	0,62	0,08	13,2		14.02.2011	Conc. 3	0,69	0,00	0,0

Table B27: Tukey's test DGT-labile Copper

Sample	Water type	Treatments	Metal	p value
DGT	Deeper	Control vs. conc. 2	Cu	0.001
DGT	Deeper	Control vs. conc. 3	Cu	0.001
DGT	Deeper	Control vs. conc. 1	Cu	0.008
DGT	Deeper	Natural vs. conc. 2	Cu	0.042
DGT	Deeper	Natural vs. Conc. 3	Cu	0.045
DGT	Surface	Conc. 1 vs. conc. 2	Cu	0.019

Table B28: Linear regression DGT-labile Copper

Sample	Water type	Metal	R^2	p	Slope
DGT	Deeper	Cu	0.657	0.000	-0.811
DGT	Surface	Cu	0.410	0.018	-0.640

Table B29: Linear regression filtration Copper

Sample	Water type	Metal	R^2	p	Slope
Filtration	Deeper	Cu	0.201	0.194	0.448
Filtration	Surface	Cu	0.349	0.072	0.591

Table B30: Tukey's test normalization Copper

Sample	Water type	Treatments	Metal	p value
Normalization	Surface	Control vs. conc. 3	Cu	0.033
Normalization	Surface	Control vs. Conc. 1	Cu	0.041

Table B31: Linear regression normalization Copper

Sample	Water type	Metal	R^2	p	Slope
Normalization	Deeper	Cu	0.238	0.152	-0.488
Normalization	Surface	Cu	0.464	0.030	-0.681

Table B32: One-way ANOVA summary, all metals, all sample types

Sample type	P/D	Treatment	Metal	p	Significant difference?
Chelex	P	Deeper	Cd	0,332	NO
Chelex	P	Surface	Cd	0,584	NO
Chelex	D	Deeper	Cd	0,117	NO
Chelex	D	Surface	Cd	0,856	NO
Chelex	P	Deeper	Cu	0,205	NO
Chelex	P	Surface	Cu	0,728	NO
Chelex	D	Deeper	Cu	0,628	NO
Chelex	D	Surface	Cu	0,954	NO
Chelex	P	Deeper	Mo	0,21	NO
Chelex	P	Surface	Mo	0,898	NO
Chelex	D	Deeper	Mo	0,059	NO
Chelex	D	Surface	Mo	0,909	NO
Chelex	P	Deeper	Ni	0,842	NO
Chelex	P	Surface	Ni	0,933	NO
Chelex	D	Deeper	Ni	0,188	NO
Chelex	D	Surface	Ni	0,534	NO
DGT	-	Deeper	Cd	1E-06	YES
DGT	-	Surface	Cd	6E-08	YES
DGT	-	Deeper	Cu	4E-04	YES
DGT	-	Surface	Cu	0,024	YES
DGT	-	Deeper	Mo	4E-05	YES
DGT	-	Surface	Mo	0,008	YES
DGT	-	Deeper	Ni	0,002	YES
DGT	-	Surface	Ni	4E-04	YES
Filtration	-	Surface	Cd	0,311	NO

Filtration	-	Deeper	Cd	0,015	YES
Filtration	-	Deeper	Cu	0,068	NO
Filtration	-	Surface	Cu	0,061	NO
Filtration	-	Surface	Mo	0,067	NO
Filtration	-	Deeper	Mo	0,008	YES
Filtration	-	Surface	Ni	0,067	NO
Filtration	-	Deeper	Ni	0,008	YES
Direct	P	Deeper	Cd	0,461	NO
Direct	P	Surface	Cd	0,592	NO
Direct	D	Surface	Cd	0,215	NO
Direct	D	Deeper	Cd	0,029	YES
Direct	P	Deeper	Cu	0,197	NO
Direct	P	Surface	Cu	0,8	NO
Direct	D	Deeper	Cu	0,713	NO
Direct	D	Surface	Cu	0,683	NO
Direct	P	Deeper	Mo	0,122	NO
Direct	P	Surface	Mo	0,835	NO
Direct	D	Deeper	Mo	0,189	NO
Direct	D	Surface	Mo	0,193	NO
Direct	P	Deeper	Ni	0,812	NO
Direct	P	Surface	Ni	0,454	NO
Direct	D	Deeper	Ni	0,962	NO
Direct	D	Surface	Ni	0,976	NO
Norm w/POC	-	Deeper	Cd	0,019	YES
Norm w/POC	-	Surface	Cd	0,945	NO
Norm w/POC	-	Deeper	Mo	0,003	YES
Norm w/POC	-	Surface	Mo	2E-04	YES
Norm w/POC	-	Deeper	Ni	0,12	NO
Norm w/POC	-	Surface	Ni	0,717	NO
Norm w/POC	-	Deeper	Cu	0,282	NO
Norm w/POC	-	Surface	Cu	0,028	YES

APPENDIX C

Table C1: Results sheet Chelex samples; cadmium

									Concentration				
									Uncorrected		Corrected		
Smpl	Tank/Depth	Fract	Vol (mL)	Date	Type of sample	Method	Project-Inr	Element	µg.L^{-1}	RSD %	µg.L^{-1}	Mol.L^{-1}	nM
1	10 m	P	159	23.01.2011	Depth	Chelex	1	Cd 111(LR)	1,10	3,6	0,035	3,09E-10	0,31
2	10 m	D	166	23.01.2011	Depth	Chelex	2	Cd 111(LR)	1,25	1,0	0,038	3,36E-10	0,34
3	5	P	153	23.01.2011	Tank	Chelex	3	Cd 111(LR)	0,68	3,1	0,022	1,97E-10	0,20
4	5	D	170	24.01.2011	Tank	Chelex	4	Cd 111(LR)	0,75	3,9	0,022	1,96E-10	0,20
5	Brk	P	151	24.01.2011	Depth	Chelex	5	Cd 111(LR)	0,70	3,0	0,023	2,06E-10	0,21
6	Brk	D	160	24.01.2011	Depth	Chelex	6	Cd 111(LR)	0,84	4,7	0,026	2,33E-10	0,23
7	1	P	165	26.01.2011	Tank	Chelex	7	Cd 111(LR)	0,73	6,6	0,022	1,97E-10	0,20
8	1	D	164	26.01.2011	Tank	Chelex	8	Cd 111(LR)	0,21	0,8	0,006	5,75E-11	0,06
9	2	P	167	26.01.2011	Tank	Chelex	9	Cd 111(LR)	0,62	3,0	0,019	1,65E-10	0,16
10	2	D	159	26.01.2011	Tank	Chelex	10	Cd 111(LR)	0,61	6,7	0,019	1,69E-10	0,17
11	3	P	149	26.01.2011	Tank	Chelex	11	Cd 111(LR)	1,08	3,1	0,036	3,21E-10	0,32
12	3	D	176	26.01.2011	Tank	Chelex	12	Cd 111(LR)	1,12	1,9	0,032	2,82E-10	0,28
13	4	P	143	26.01.2011	Tank	Chelex	13	Cd 111(LR)	0,71	2,1	0,025	2,21E-10	0,22
14	4	D	173	26.01.2011	Tank	Chelex	14	Cd 111(LR)	0,92	2,9	0,027	2,36E-10	0,24
15	5	P	143	26.01.2011	Tank	Chelex	15	Cd 111(LR)	1,51	5,2	0,053	4,71E-10	0,47
16	5	D	162	26.01.2011	Tank	Chelex	16	Cd 111(LR)	0,85	2,7	0,026	2,34E-10	0,23
17	6	P	161	27.01.2011	Tank	Chelex	17	Cd 111(LR)	0,96	5,2	0,030	2,65E-10	0,27
18	6	D	175	27.01.2011	Tank	Chelex	18	Cd 111(LR)	1,20	2,0	0,034	3,05E-10	0,31
19	7	P	176	27.01.2011	Tank	Chelex	19	Cd 111(LR)	1,13	0,9	0,032	2,86E-10	0,29
20	7	D	143	27.01.2011	Tank	Chelex	20	Cd 111(LR)	0,76	2,0	0,026	2,35E-10	0,24
21	8	P	159	27.01.2011	Tank	Chelex	21	Cd 111(LR)	0,80	2,7	0,025	2,23E-10	0,22
22	8	D	157	27.01.2011	Tank	Chelex	22	Cd 111(LR)	0,83	4,0	0,026	2,34E-10	0,23

23	9	P	183	27.01.2011	Tank	Chelex	23	Cd 111(LR)	1,00	5,6	0,027	2,44E-10	0,24
24	9	D	158	27.01.2011	Tank	Chelex	24	Cd 111(LR)	1,24	1,6	0,039	3,50E-10	0,35
25	10	P	176	27.01.2011	Tank	Chelex	25	Cd 111(LR)	1,23	5,6	0,035	3,12E-10	0,31
26	10	D	164	27.01.2011	Tank	Chelex	26	Cd 111(LR)	0,86	4,2	0,026	2,34E-10	0,23
27	1	P	184	29.01.2011	Tank	Chelex	27	Cd 111(LR)	0,68	2,5	0,019	1,66E-10	0,17
28	1	D	173	29.01.2011	Tank	Chelex	28	Cd 111(LR)	0,81	4,8	0,024	2,09E-10	0,21
29	2	P	176	29.01.2011	Tank	Chelex	29	Cd 111(LR)	0,67	4,6	0,019	1,69E-10	0,17
30	2	D	116	29.01.2011	Tank	Chelex	30	Cd 111(LR)	0,62	1,5	0,027	2,39E-10	0,24
31	3	P	180	29.01.2011	Tank	Chelex	31	Cd 111(LR)	0,95	3,3	0,026	2,34E-10	0,23
32	3	D	112	29.01.2011	Tank	Chelex	32	Cd 111(LR)	0,71	3,1	0,032	2,85E-10	0,28
33	4	P	159	29.01.2011	Tank	Chelex	33	Cd 111(LR)	0,74	5,9	0,023	2,09E-10	0,21
34	4	D	161	29.01.2011	Tank	Chelex	34	Cd 111(LR)	0,79	3,6	0,025	2,18E-10	0,22
35	5	P	160	29.01.2011	Tank	Chelex	35	Cd 111(LR)	0,66	4,9	0,021	1,83E-10	0,18
36	5	D	161	29.01.2011	Tank	Chelex	36	Cd 111(LR)	0,65	5,0	0,020	1,79E-10	0,18
37	6	P	117	30.01.2011	Tank	Chelex	37	Cd 111(LR)	0,70	3,1	0,030	2,67E-10	0,27
38	6	D	123	30.01.2011	Tank	Chelex	38	Cd 111(LR)	0,63	3,5	0,025	2,27E-10	0,23
39	7	P	125	30.01.2011	Tank	Chelex	39	Cd 111(LR)	0,74	5,7	0,029	2,62E-10	0,26
40	7	D	131	30.01.2011	Tank	Chelex	40	Cd 111(LR)	0,82	1,5	0,031	2,77E-10	0,28
41	8	P	111	30.01.2011	Tank	Chelex	41	Cd 111(LR)	0,69	4,4	0,031	2,79E-10	0,28
42	8	D	124	30.01.2011	Tank	Chelex	42	Cd 111(LR)	0,53	3,5	0,021	1,88E-10	0,19
43	9	P	125	30.01.2011	Tank	Chelex	43	Cd 111(LR)	0,77	4,5	0,031	2,73E-10	0,27
44	9	D	128	30.01.2011	Tank	Chelex	44	Cd 111(LR)	0,79	6,1	0,031	2,75E-10	0,27
45	10	P	122	30.01.2011	Tank	Chelex	45	Cd 111(LR)	0,49	1,7	0,020	1,78E-10	0,18
46	10	D	126	30.01.2011	Tank	Chelex	46	Cd 111(LR)	0,26	1,7	0,010	9,26E-11	0,09
47	1	P	161	04.02.2011	Tank	Chelex	47	Cd 111(LR)	1,48	2,7	0,046	4,08E-10	0,41
48	1	D	120	04.02.2011	Tank	Chelex	48	Cd 111(LR)	0,82	3,4	0,034	3,05E-10	0,30
49	2	P	112	04.02.2011	Tank	Chelex	49	Cd 111(LR)	0,66	3,3	0,029	2,59E-10	0,26
50	2	D	114	04.02.2011	Tank	Chelex	50	Cd 111(LR)	1,07	2,3	0,047	4,18E-10	0,42
51	3	P	116	04.02.2011	Tank	Chelex	51	Cd 111(LR)	3,93	3,9	0,169	1,50E-09	1,50
52	3	D	116	04.02.2011	Tank	Chelex	52	Cd 111(LR)	0,39	4,4	0,017	1,49E-10	0,15
53	4	P	152	04.02.2011	Tank	Chelex	53	Cd 111(LR)	0,62	3,4	0,020	1,80E-10	0,18
53	4	P	152	04.02.2011	Tank	Chelex	53	Cd 111(LR)	0,62	0,8	0,020	1,79E-10	0,18
54	4	D	150	04.02.2011	Tank	Chelex	54	Cd 111(LR)	0,69	2,9	0,023	2,06E-10	0,21
55	5	P	169	04.02.2011	Tank	Chelex	55	Cd 111(LR)	0,65	1,7	0,019	1,70E-10	0,17

56	5	D	140	04.02.2011	Tank	Chelex	56	Cd 111(LR)	0,36	3,0	0,013	1,14E-10	0,11
57	6	P	182	05.02.2011	Tank	Chelex	57	Cd 111(LR)	1,06	5,9	0,029	2,59E-10	0,26
58	6	D	174	05.02.2011	Tank	Chelex	58	Cd 111(LR)	0,13	1,2	0,004	3,42E-11	0,03
59	7	P	155	05.02.2011	Tank	Chelex	59	Cd 111(LR)	1,10	0,4	0,036	3,16E-10	0,32
60	7	D	160	05.02.2011	Tank	Chelex	60	Cd 111(LR)	1,24	2,7	0,039	3,46E-10	0,35
61	8	P	152	05.02.2011	Tank	Chelex	61	Cd 111(LR)	0,86	3,9	0,028	2,52E-10	0,25
62	8	D	155	05.02.2011	Tank	Chelex	62	Cd 111(LR)	0,62	0,1	0,020	1,77E-10	0,18
63	9	P	173	05.02.2011	Tank	Chelex	63	Cd 111(LR)	0,68	4,0	0,020	1,75E-10	0,17
64	9	D	161	05.02.2011	Tank	Chelex	64	Cd 111(LR)	1,07	2,6	0,033	2,96E-10	0,30
65	10	P	144	05.02.2011	Tank	Chelex	65	Cd 111(LR)	0,78	1,6	0,027	2,41E-10	0,24
66	10	D	166	05.02.2011	Tank	Chelex	66	Cd 111(LR)	1,43	2,2	0,043	3,83E-10	0,38
67	1	P	119	13.02.2011	Tank	Chelex	67	Cd 111(LR)	0,62	2,2	0,026	2,30E-10	0,23
68	1	D	112	13.02.2011	Tank	Chelex	68	Cd 111(LR)	0,73	4,7	0,033	2,90E-10	0,29
69	2	P	126	13.02.2011	Tank	Chelex	69	Cd 111(LR)	0,64	1,7	0,025	2,25E-10	0,22
70	2	D	117	13.02.2011	Tank	Chelex	70	Cd 111(LR)	0,56	3,8	0,024	2,13E-10	0,21
71	3	P	117	13.02.2011	Tank	Chelex	71	Cd 111(LR)	0,88	2,1	0,037	3,34E-10	0,33
72	3	D	121	13.02.2011	Tank	Chelex	72	Cd 111(LR)	0,47	4,7	0,020	1,74E-10	0,17
73	4	P	121	13.02.2011	Tank	Chelex	73	Cd 111(LR)	0,28	3,0	0,011	1,02E-10	0,10
74	4	D	121	13.02.2011	Tank	Chelex	74	Cd 111(LR)	0,27	4,3	0,011	1,00E-10	0,10
75	5	P	101	13.02.2011	Tank	Chelex	75	Cd 111(LR)	0,29	7,9	0,014	1,29E-10	0,13
76	5	D	108	13.02.2011	Tank	Chelex	76	Cd 111(LR)	0,25	3,5	0,012	1,03E-10	0,10
77	6	P	120	14.02.2011	Tank	Chelex	77	Cd 111(LR)	0,03	1,9	0,001	1,25E-11	0,01
78	6	D	107	14.02.2011	Tank	Chelex	78	Cd 111(LR)	0,81	2,4	0,038	3,36E-10	0,34
79	7	P	117	14.02.2011	Tank	Chelex	79	Cd 111(LR)	0,64	3,7	0,027	2,44E-10	0,24
80	7	D	95	14.02.2011	Tank	Chelex	80	Cd 111(LR)	0,64	1,8	0,034	3,01E-10	0,30
81	8	P	112	14.02.2011	Tank	Chelex	81	Cd 111(LR)	0,66	2,7	0,030	2,63E-10	0,26
82	8	D	112	14.02.2011	Tank	Chelex	82	Cd 111(LR)	0,56	2,7	0,025	2,24E-10	0,22
83	9	P	102	14.02.2011	Tank	Chelex	83	Cd 111(LR)	0,62	5,0	0,030	2,69E-10	0,27
84	9	D	120	14.02.2011	Tank	Chelex	84	Cd 111(LR)	0,38	3,7	0,016	1,40E-10	0,14
85	10	P	117	14.02.2011	Tank	Chelex	85	Cd 111(LR)	0,48	1,5	0,020	1,81E-10	0,18
86	10	D	116	14.02.2011	Tank	Chelex	86	Cd 111(LR)	0,31	1,7	0,013	1,19E-10	0,12
A	10	P	120		Depth Profile	Chelex	87	Cd 111(LR)	1,40	4,3	0,058	5,20E-10	0,52
B	10	D	120		Depth Profile	Chelex	88	Cd 111(LR)	0,72	1,2	0,030	2,67E-10	0,27
C	0	P	122		Depth Profile	Chelex	89	Cd 111(LR)	0,35	6,9	0,014	1,28E-10	0,13

D	0	D	115		Depth Profile	Chelex	90	Cd 111(LR)	0,12	3,9	0,005	4,46E-11	0,04
E	4	P	120		Depth Profile	Chelex	91	Cd 111(LR)	0,46	1,9	0,019	1,70E-10	0,17
F	4	D	126		Depth Profile	Chelex	92	Cd 111(LR)	0,29	4,4	0,012	1,03E-10	0,10
G	50	P	103		Depth Profile	Chelex	93	Cd 111(LR)	1,10	2,7	0,054	4,76E-10	0,48
H	50	D	125		Depth Profile	Chelex	94	Cd 111(LR)	1,07	8,0	0,043	3,83E-10	0,38
I	30	P	125		Depth Profile	Chelex	95	Cd 111(LR)	1,33	4,4	0,053	4,72E-10	0,47
J	30	D	120		Depth Profile	Chelex	96	Cd 111(LR)	1,07	6,5	0,045	3,98E-10	0,40
K	70	P	100		Depth Profile	Chelex	97	Cd 111(LR)	1,04	3,1	0,052	4,62E-10	0,46
L	70	D	120		Depth Profile	Chelex	98	Cd 111(LR)	1,30	0,9	0,054	4,84E-10	0,48
M	A	P	28		River	Chelex	99	Cd 111(LR)	0,18	5,5	0,031	2,80E-10	0,28
N	B	P	50		River	Chelex	100	Cd 111(LR)	0,90	0,9	0,090	7,98E-10	0,80
O	C	P	48		River	Chelex	101	Cd 111(LR)	0,26	7,2	0,027	2,42E-10	0,24
P	A	D	45		River	Chelex	102	Cd 111(LR)	0,10	9,3	0,011	9,98E-11	0,10
Q	B	D	45		River	Chelex	103	Cd 111(LR)	0,08	4,0	0,009	7,83E-11	0,08
R	C	D	45		River	Chelex	104	Cd 111(LR)	0,04	13,7	0,005	4,11E-11	0,04

Table C2: Results sheet DGT samples; cadmium

										Concentration					
										Uncorrected		**Corrected**			
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Time (sec)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**M (ng) DGT**	**Mol.L^{-1}**	**nM**
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	132	Cd 111(LR)	0,41	5,6	0,09	2,53	7,97E-10	0,80
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	133	Cd 111(LR)	0,39	2,7	0,09	2,41	7,59E-10	0,76
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	134	Cd 111(LR)	0,55	4,4	0,10	3,45	9,15E-10	0,91
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	135	Cd 111(LR)	0,42	4,2	0,08	2,65	7,01E-10	0,70
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	136	Cd 111(LR)	0,57	5,4	0,08	3,57	7,09E-10	0,71
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	137	Cd 111(LR)	0,53	8,9	0,07	3,32	6,60E-10	0,66
2	5	D	1700	214740	23.01.2011	Tank	DGT	138	Cd 111(LR)	0,21	10,1	0,05	1,31	4,11E-10	0,41
2	5	D	1700	214740	23.01.2011	Tank	DGT	139	Cd 111(LR)	0,19	4,9	0,04	1,18	3,72E-10	0,37
2	5	D	1700	255240	23.01.2011	Tank	DGT	140	Cd 111(LR)	0,31	7,2	0,06	1,93	5,10E-10	0,51

2	5	D	1700	255240	23.01.2011	Tank	DGT	141	Cd 111(LR)	0,34	3,8	0,06	2,11	5,58E-10	0,56
2	5	D	1700	340140	23.01.2011	Tank	DGT	142	Cd 111(LR)	0,34	6,0	0,05	2,12	4,21E-10	0,42
2	5	D	1700	340140	23.01.2011	Tank	DGT	143	Cd 111(LR)	0,38	5,5	0,05	2,36	4,69E-10	0,47
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	144	Cd 111(LR)	0,27	1,3	0,07	1,68	6,40E-10	0,64
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	145	Cd 111(LR)	0,26	2,6	0,07	1,63	6,22E-10	0,62
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	146	Cd 111(LR)	0,35	6,8	0,06	2,21	5,37E-10	0,54
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	147	Cd 111(LR)	0,37	4,6	0,06	2,32	5,63E-10	0,56
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	148	Cd 111(LR)	0,35	3,7	0,06	2,20	5,36E-10	0,54
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	149	Cd 111(LR)	0,33	3,8	0,06	2,05	4,99E-10	0,50
4	5	P	1360	176880	23.01.2011	Tank	DGT	150	Cd 111(LR)	0,13	7,3	0,03	0,81	3,09E-10	0,31
4	5	P	1360	176880	23.01.2011	Tank	DGT	151	Cd 111(LR)	0,16	5,7	0,04	1,02	3,89E-10	0,39
4	5	P	1360	277800	23.01.2011	Tank	DGT	152	Cd 111(LR)	0,29	3,3	0,05	1,82	4,43E-10	0,44
4	5	P	1360	277800	23.01.2011	Tank	DGT	153	Cd 111(LR)	0,19	9,7	0,03	1,21	2,95E-10	0,29
4	5	P	1360	277800	23.01.2011	Tank	DGT	154	Cd 111(LR)	0,25	6,2	0,04	1,58	3,85E-10	0,39
4	5	P	1360	277800	23.01.2011	Tank	DGT	155	Cd 111(LR)	0,24	7,5	0,04	1,52	3,70E-10	0,37
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	156	Cd 111(LR)	0,15	6,9	0,04	0,93	3,66E-10	0,37
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	157	Cd 111(LR)	0,22	10,5	0,06	1,39	5,47E-10	0,55
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	158	Cd 111(LR)	0,19	9,3	0,04	1,21	3,17E-10	0,32
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	159	Cd 111(LR)	0,16	2,1	0,03	0,97	2,55E-10	0,25
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	160	Cd 111(LR)	0,30	3,1	0,04	1,87	3,99E-10	0,40
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	161	Cd 111(LR)	0,55	3,5	0,08	3,41	7,27E-10	0,73
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	162	Cd 111(LR)	0,17	6,4	0,05	1,05	4,12E-10	0,41
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	163	Cd 111(LR)	0,12	8,3	0,03	0,74	2,92E-10	0,29
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	164	Cd 111(LR)	0,20	4,0	0,04	1,23	3,23E-10	0,32
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	165	Cd 111(LR)	0,14	3,4	0,03	0,88	2,30E-10	0,23
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	166	Cd 111(LR)	0,25	3,7	0,04	1,58	3,35E-10	0,33
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	167	Cd 111(LR)	0,19	3,0	0,03	1,17	2,48E-10	0,25
7	1	P	2360	250200	26.01.2011	Tank	DGT	168	Cd 111(LR)	0,26	7,5	0,05	1,61	4,35E-10	0,43
7	1	P	2360	250200	26.01.2011	Tank	DGT	169	Cd 111(LR)	0,26	6,9	0,05	1,62	4,37E-10	0,44
7	1	P	2360	250200	26.01.2011	Tank	DGT	170	Cd 111(LR)	0,38	5,4	0,07	2,36	6,38E-10	0,64
8	2	P	2050	250200	26.01.2011	Tank	DGT	171	Cd 111(LR)	0,26	2,0	0,05	1,59	4,31E-10	0,43
8	2	P	2050	250200	26.01.2011	Tank	DGT	172	Cd 111(LR)	0,23	2,1	0,04	1,41	3,80E-10	0,38
8	2	P	2050	250200	26.01.2011	Tank	DGT	173	Cd 111(LR)	0,22	5,6	0,04	1,40	3,78E-10	0,38
9	3	P	1345	250200	26.01.2011	Tank	DGT	174	Cd 111(LR)	0,18	7,8	0,03	1,13	3,05E-10	0,30

9	3	P	1345	250200	26.01.2011	Tank	DGT	175	Cd 111(LR)	0,13	10,6	0,02	0,79	2,13E-10	0,21
9	3	P	1345	250200	26.01.2011	Tank	DGT	176	Cd 111(LR)	0,16	3,8	0,03	1,03	2,78E-10	0,28
10	4	P	1460	250200	26.01.2011	Tank	DGT	177	Cd 111(LR)	0,13	6,5	0,02	0,81	2,19E-10	0,22
10	4	P	1460	250200	26.01.2011	Tank	DGT	178	Cd 111(LR)	0,13	11,1	0,02	0,80	2,16E-10	0,22
10	4	P	1460	250200	26.01.2011	Tank	DGT	179	Cd 111(LR)	0,13	4,8	0,02	0,79	2,14E-10	0,21
11	5	P	1470	250200	26.01.2011	Tank	DGT	180	Cd 111(LR)	0,05	4,2	0,01	0,31	8,42E-11	0,08
11	5	P	1470	250200	26.01.2011	Tank	DGT	181	Cd 111(LR)	0,04	3,3	0,01	0,24	6,40E-11	0,06
11	5	P	1470	250200	26.01.2011	Tank	DGT	182	Cd 111(LR)	0,02	10,9	0,00	0,12	3,14E-11	0,03
12	6	P	2000	252000	27.01.2011	Tank	DGT	183	Cd 111(LR)	0,14	4,7	0,03	0,90	2,41E-10	0,24
12	6	P	2000	252000	27.01.2011	Tank	DGT	184	Cd 111(LR)	0,14	2,3	0,03	0,86	2,30E-10	0,23
12	6	P	2000	252000	27.01.2011	Tank	DGT	185	Cd 111(LR)	0,15	5,2	0,03	0,91	2,44E-10	0,24
13	7	P	2000	252000	27.01.2011	Tank	DGT	186	Cd 111(LR)	0,15	2,3	0,03	0,92	2,47E-10	0,25
13	7	P	2000	252000	27.01.2011	Tank	DGT	187	Cd 111(LR)	0,16	3,7	0,03	1,02	2,74E-10	0,27
13	7	P	2000	252000	27.01.2011	Tank	DGT	188	Cd 111(LR)	0,17	0,9	0,03	1,05	2,81E-10	0,28
14	8	P	1500	252000	27.01.2011	Tank	DGT	189	Cd 111(LR)	0,10	12,7	0,02	0,60	1,62E-10	0,16
14	8	P	1500	252000	27.01.2011	Tank	DGT	190	Cd 111(LR)	0,19	4,0	0,04	1,20	3,23E-10	0,32
14	8	P	1500	252000	27.01.2011	Tank	DGT	191	Cd 111(LR)	0,10	4,5	0,02	0,63	1,68E-10	0,17
15	9	P	1500	252000	27.01.2011	Tank	DGT	192	Cd 111(LR)	0,12	4,3	0,02	0,75	2,00E-10	0,20
15	9	P	1500	252000	27.01.2011	Tank	DGT	193	Cd 111(LR)	0,13	8,5	0,02	0,81	2,17E-10	0,22
15	9	P	1500	252000	27.01.2011	Tank	DGT	194	Cd 111(LR)	0,13	3,3	0,02	0,83	2,22E-10	0,22
16	10	P	2000	283800	27.01.2011	Tank	DGT	195	Cd 111(LR)	0,10	10,5	0,02	0,61	1,45E-10	0,14
16	10	P	2000	283800	27.01.2011	Tank	DGT	196	Cd 111(LR)	0,07	18,1	0,01	0,41	9,71E-11	0,10
16	10	P	2000	283800	27.01.2011	Tank	DGT	197	Cd 111(LR)	0,08	3,5	0,01	0,52	1,23E-10	0,12
17	4	P	2000	405120	29.01.2011	Tank	DGT	198	Cd 111(LR)	0,15	2,0	0,02	0,94	1,57E-10	0,16
17	4	P	2000	405120	29.01.2011	Tank	DGT	199	Cd 111(LR)	0,14	7,4	0,02	0,90	1,50E-10	0,15
18	5	P	2000	405120	29.01.2011	Tank	DGT	200	Cd 111(LR)	0,24	2,9	0,03	1,52	2,53E-10	0,25
18	5	P	2000	405120	29.01.2011	Tank	DGT	201	Cd 111(LR)	0,16	4,1	0,02	0,99	1,65E-10	0,17
19	9	P	1500	313140	30.01.2011	Tank	DGT	202	Cd 111(LR)	0,15	10,5	0,02	0,95	2,05E-10	0,20
19	9	P	1500	313140	30.01.2011	Tank	DGT	203	Cd 111(LR)	0,18	7,9	0,03	1,12	2,43E-10	0,24
20	10	P	1500	312900	30.01.2011	Tank	DGT	204	Cd 111(LR)	0,06	5,7	0,01	0,36	7,80E-11	0,08
20	10	P	1500	312900	30.01.2011	Tank	DGT	205	Cd 111(LR)	0,43	4,4	0,07	2,68	5,79E-10	0,58
21	1	P	2000	253200	04.02.2011	Tank	DGT	206	Cd 111(LR)	0,15	8,2	0,03	0,95	2,55E-10	0,25
21	1	P	2000	253200	04.02.2011	Tank	DGT	207	Cd 111(LR)	0,12	5,6	0,02	0,75	2,01E-10	0,20
21	1	P	2000	253200	04.02.2011	Tank	DGT	208	Cd 111(LR)	0,13	4,7	0,02	0,81	2,17E-10	0,22

22	2	P	2000	252600	04.02.2011	Tank	DGT	209	Cd 111(LR)	0,13	7,0	0,02	0,79	2,12E-10	0,21
22	2	P	2000	252600	04.02.2011	Tank	DGT	210	Cd 111(LR)	0,12	1,4	0,02	0,74	1,98E-10	0,20
22	2	P	2000	252600	04.02.2011	Tank	DGT	211	Cd 111(LR)	0,10	0,6	0,02	0,64	1,71E-10	0,17
23	3	P	2000	252420	04.02.2011	Tank	DGT	212	Cd 111(LR)	0,15	5,6	0,03	0,91	2,43E-10	0,24
23	3	P	2000	252420	04.02.2011	Tank	DGT	213	Cd 111(LR)	0,10	16,7	0,02	0,65	1,75E-10	0,18
23	3	P	2000	252420	04.02.2011	Tank	DGT	214	Cd 111(LR)	0,10	3,8	0,02	0,66	1,76E-10	0,18
24	4	P	1500	252180	04.02.2011	Tank	DGT	215	Cd 111(LR)	0,06	8,4	0,01	0,39	1,05E-10	0,11
24	4	P	1500	252180	04.02.2011	Tank	DGT	216	Cd 111(LR)	0,07	4,5	0,01	0,41	1,11E-10	0,11
24	4	P	1500	252180	04.02.2011	Tank	DGT	217	Cd 111(LR)	0,10	3,7	0,02	0,61	1,64E-10	0,16
25	5	P	1500	252000	04.02.2011	Tank	DGT	218	Cd 111(LR)	0,02	20,4	0,00	0,12	3,09E-11	0,03
25	5	P	1500	252000	04.02.2011	Tank	DGT	219	Cd 111(LR)	0,05	12,4	0,01	0,29	7,83E-11	0,08
25	5	P	1500	252000	04.02.2011	Tank	DGT	220	Cd 111(LR)	0,02	3,9	0,00	0,15	3,97E-11	0,04
26	6	P	1500	426300	05.02.2011	Tank	DGT	221	Cd 111(LR)	0,28	8,0	0,03	1,75	2,77E-10	0,28
26	6	P	1500	426300	05.02.2011	Tank	DGT	222	Cd 111(LR)	0,39	5,5	0,04	2,43	3,85E-10	0,39
26	6	P	1500	426300	05.02.2011	Tank	DGT	223	Cd 111(LR)	0,28	5,2	0,03	1,74	2,76E-10	0,28
27	7	P	1500	426300	05.02.2011	Tank	DGT	224	Cd 111(LR)	0,28	3,1	0,03	1,74	2,76E-10	0,28
27	7	P	1500	426300	05.02.2011	Tank	DGT	225	Cd 111(LR)	0,27	6,8	0,03	1,67	2,65E-10	0,27
27	7	P	1500	426300	05.02.2011	Tank	DGT	226	Cd 111(LR)	0,28	7,6	0,03	1,77	2,81E-10	0,28
28	8	P	1500	426300	05.02.2011	Tank	DGT	227	Cd 111(LR)	0,18	2,1	0,02	1,11	1,76E-10	0,18
28	8	P	1500	426300	05.02.2011	Tank	DGT	228	Cd 111(LR)	0,15	2,6	0,02	0,92	1,46E-10	0,15
28	8	P	1500	426300	05.02.2011	Tank	DGT	229	Cd 111(LR)	0,15	4,6	0,02	0,93	1,47E-10	0,15
29	9	P	1500	426300	05.02.2011	Tank	DGT	230	Cd 111(LR)	0,07	8,7	0,01	0,44	7,04E-11	0,07
29	9	P	1500	426300	05.02.2011	Tank	DGT	231	Cd 111(LR)	0,07	11,7	0,01	0,45	7,12E-11	0,07
29	9	P	1500	426300	05.02.2011	Tank	DGT	232	Cd 111(LR)	0,08	9,9	0,01	0,50	7,86E-11	0,08
30	10	P	1500	426300	05.02.2011	Tank	DGT	233	Cd 111(LR)	0,04	10,0	0,00	0,25	3,98E-11	0,04
30	10	P	1500	426300	05.02.2011	Tank	DGT	234	Cd 111(LR)	0,05	5,6	0,01	0,31	4,91E-11	0,05
30	10	P	1500	426300	05.02.2011	Tank	DGT	235	Cd 111(LR)	0,04	9,3	0,00	0,25	3,94E-11	0,04
31	1	P	1500	259860	13.02.2011	Tank	DGT	236	Cd 111(LR)	0,10	10,3	0,02	0,64	1,65E-10	0,17
31	1	P	1500	259860	13.02.2011	Tank	DGT	237	Cd 111(LR)	0,09	12,4	0,02	0,55	1,43E-10	0,14
31	1	P	1500	259860	13.02.2011	Tank	DGT	238	Cd 111(LR)	0,12	5,8	0,02	0,75	1,96E-10	0,20
32	2	P	1500	259860	13.02.2011	Tank	DGT	239	Cd 111(LR)	0,09	9,3	0,02	0,59	1,53E-10	0,15
32	2	P	1500	259860	13.02.2011	Tank	DGT	240	Cd 111(LR)	0,11	8,3	0,02	0,69	1,80E-10	0,18
32	2	P	1500	259860	13.02.2011	Tank	DGT	241	Cd 111(LR)	0,10	8,7	0,02	0,61	1,60E-10	0,16
33	3	P	2000	259860	13.02.2011	Tank	DGT	242	Cd 111(LR)	0,13	3,8	0,02	0,80	2,07E-10	0,21

33	3	P	2000	259860	13.02.2011	Tank	DGT	243	Cd 111(LR)	0,15	4,7	0,03	0,92	2,38E-10	0,24
33	3	P	2000	259860	13.02.2011	Tank	DGT	244	Cd 111(LR)	0,12	6,6	0,02	0,78	2,03E-10	0,20
34	4	P	2000	259860	13.02.2011	Tank	DGT	245	Cd 111(LR)	0,04	8,6	0,01	0,28	7,27E-11	0,07
34	4	P	2000	259860	13.02.2011	Tank	DGT	246	Cd 111(LR)	0,04	9,8	0,01	0,22	5,70E-11	0,06
34	4	P	2000	259860	13.02.2011	Tank	DGT	247	Cd 111(LR)	0,04	9,5	0,01	0,23	6,03E-11	0,06
35	5	P	2000	259860	13.02.2011	Tank	DGT	248	Cd 111(LR)	0,04	4,0	0,01	0,24	6,13E-11	0,06
35	5	P	2000	259860	13.02.2011	Tank	DGT	249	Cd 111(LR)	0,03	15,0	0,01	0,19	4,93E-11	0,05
35	5	P	2000	259860	13.02.2011	Tank	DGT	250	Cd 111(LR)	0,03	19,1	0,01	0,19	5,00E-11	0,05
36	6	P	1500	256560	14.02.2011	Tank	DGT	251	Cd 111(LR)	0,15	2,4	0,03	0,96	2,53E-10	0,25
36	6	P	1500	256560	14.02.2011	Tank	DGT	252	Cd 111(LR)	0,19	7,0	0,03	1,17	3,08E-10	0,31
36	6	P	1500	256560	14.02.2011	Tank	DGT	253	Cd 111(LR)	0,16	2,9	0,03	0,98	2,59E-10	0,26
37	7	P	1500	256560	14.02.2011	Tank	DGT	254	Cd 111(LR)	0,18	7,4	0,03	1,11	2,93E-10	0,29
37	7	P	1500	256560	14.02.2011	Tank	DGT	255	Cd 111(LR)	0,18	9,1	0,03	1,15	3,03E-10	0,30
37	7	P	1500	256560	14.02.2011	Tank	DGT	256	Cd 111(LR)	0,20	5,4	0,04	1,22	3,22E-10	0,32
38	8	P	1500	256560	14.02.2011	Tank	DGT	257	Cd 111(LR)	0,11	4,8	0,02	0,69	1,82E-10	0,18
38	8	P	1500	256560	14.02.2011	Tank	DGT	258	Cd 111(LR)	0,12	6,8	0,02	0,73	1,92E-10	0,19
38	8	P	1500	256560	14.02.2011	Tank	DGT	259	Cd 111(LR)	0,10	6,0	0,02	0,64	1,69E-10	0,17
39	9	P	2000	255060	14.02.2011	Tank	DGT	260	Cd 111(LR)	0,05	7,2	0,01	0,29	7,70E-11	0,08
39	9	P	2000	255060	14.02.2011	Tank	DGT	261	Cd 111(LR)	0,04	6,0	0,01	0,27	7,13E-11	0,07
39	9	P	2000	255060	14.02.2011	Tank	DGT	262	Cd 111(LR)	0,04	7,4	0,01	0,27	7,25E-11	0,07
40	10	P	2000	255060	14.02.2011	Tank	DGT	263	Cd 111(LR)	0,03	27,8	0,00	0,16	4,34E-11	0,04
40	10	P	2000	255060	14.02.2011	Tank	DGT	264	Cd 111(LR)	0,02	3,8	0,00	0,13	3,34E-11	0,03
40	10	P	2000	255060	14.02.2011	Tank	DGT	265	Cd 111(LR)	0,01	2,4	0,00	0,06	1,71E-11	0,02
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	266	Cd 111(LR)	0,03	19,5	0,00	0,16	3,32E-11	0,03
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	267	Cd 111(LR)	0,03	9,1	0,00	0,19	3,75E-11	0,04
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	268	Cd 111(LR)	0,03	18,8	0,00	0,20	3,99E-11	0,04
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	269	Cd 111(LR)	0,20	6,8	0,03	1,23	2,48E-10	0,25
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	270	Cd 111(LR)	0,19	1,4	0,03	1,20	2,42E-10	0,24
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	271	Cd 111(LR)	0,19	3,9	0,03	1,16	2,35E-10	0,23
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	272	Cd 111(LR)	0,27	1,9	0,04	1,68	3,34E-10	0,33
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	273	Cd 111(LR)	0,26	3,7	0,04	1,62	3,21E-10	0,32
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	274	Cd 111(LR)	0,26	1,5	0,04	1,62	3,22E-10	0,32
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	275	Cd 111(LR)	0,28	5,0	0,04	1,77	3,51E-10	0,35
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	276	Cd 111(LR)	0,25	5,7	0,04	1,58	3,14E-10	0,31

50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	277	Cd 111(LR)	0,28	4,3	0,04	1,76	3,49E-10	0,35
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	278	Cd 111(LR)	0,31	1,4	0,04	1,97	3,91E-10	0,39
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	279	Cd 111(LR)	0,29	4,9	0,04	1,82	3,61E-10	0,36
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	280	Cd 111(LR)	0,29	2,3	0,04	1,84	3,65E-10	0,37
A			920	329400	09.02.2011	River	DGT	281	Cd 111(LR)	0,02	17,0	0,00	0,10	1,99E-11	0,02
A			920	329400	09.02.2011	River	DGT	282	Cd 111(LR)	0,02	19,5	0,00	0,11	2,22E-11	0,02
A			920	329400	09.02.2011	River	DGT	283	Cd 111(LR)	0,02	5,4	0,00	0,10	2,12E-11	0,02
B			750	325800	09.02.2011	River	DGT	284	Cd 111(LR)	0,01	35,1	0,00	0,09	1,81E-11	0,02
B			750	325800	09.02.2011	River	DGT	285	Cd 111(LR)	0,02	34,7	0,00	0,10	2,00E-11	0,02
B			750	325800	09.02.2011	River	DGT	286	Cd 111(LR)	0,02	11,0	0,00	0,10	2,05E-11	0,02

Table C3: Results sheet Total filtration samples; cadmium

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
4	1	0,2	800	26.01.2011	Filtration	UC-Digest	317	Cd 111(LR)	0,02	6,7	0,0014	1,29E-11	0,013
5	2	0,2	800	26.01.2011	Filtration	UC-Digest	318	Cd 111(LR)	0,04	11,5	0,0031	2,72E-11	0,027
6	3	0,2	600	26.01.2011	Filtration	UC-Digest	319	Cd 111(LR)	0,05	12,9	0,0053	4,71E-11	0,047
7	4	0,2	600	26.01.2011	Filtration	UC-Digest	320	Cd 111(LR)	0,02	5,1	0,0022	1,94E-11	0,019
8	5	0,2	600	26.01.2011	Filtration	UC-Digest	321	Cd 111(LR)	0,02	7,8	0,0020	1,78E-11	0,018
9	6	0,2	600	27.01.2011	Filtration	UC-Digest	322	Cd 111(LR)	0,03	9,5	0,0028	2,48E-11	0,025
10	7	0,2	600	27.01.2011	Filtration	UC-Digest	323	Cd 111(LR)	0,03	9,6	0,0033	2,96E-11	0,030
11	8	0,2	600	27.01.2011	Filtration	UC-Digest	324	Cd 111(LR)	0,06	0,5	0,0062	5,55E-11	0,055
12	9	0,2	600	27.01.2011	Filtration	UC-Digest	325	Cd 111(LR)	0,03	8,8	0,0030	2,65E-11	0,027
13	10	0,2	600	27.01.2011	Filtration	UC-Digest	326	Cd 111(LR)	0,09	4,6	0,0088	7,87E-11	0,079
63	1	0,2	600	01.02.2011	Filtration	UC-Digest	376	Cd 111(LR)	-	-	-	-	-
64	2	0,2	600	01.02.2011	Filtration	UC-Digest	377	Cd 111(LR)	0,02	5,9	0,0023	2,08E-11	0,021
65	3	0,2	600	01.02.2011	Filtration	UC-Digest	378	Cd 111(LR)	0,16	1,3	0,0155	1,38E-10	0,138
66	4	0,2	600	01.02.2011	Filtration	UC-Digest	379	Cd 111(LR)	0,13	1,6	0,0134	1,19E-10	0,119

67	5	0,2	400	01.02.2011	Filtration	UC-Digest	517	Cd 111(LR)	0,12	4,6	0,0180	1,60E-10	0,160
68	6	0,2	600	02.02.2011	Filtration	UC-Digest	381	Cd 111(LR)	0,02	10,1	0,0022	1,98E-11	0,020
69	7	0,2	600	02.02.2011	Filtration	UC-Digest	382	Cd 111(LR)	0,03	3,6	0,0032	2,80E-11	0,028
70	8	0,2	600	02.02.2011	Filtration	UC-Digest	383	Cd 111(LR)	0,05	5,5	0,0048	4,26E-11	0,043
71	9	0,2	400	02.02.2011	Filtration	UC-Digest	384	Cd 111(LR)	0,13	1,1	0,0200	1,78E-10	0,178
72	10	0,2	400	02.02.2011	Filtration	UC-Digest	385	Cd 111(LR)	0,17	5,0	0,0260	2,32E-10	0,232
123	1	0,2	500	07.02.2011	Filtration	UC-Digest	436	Cd 111(LR)	0,01	18,6	0,0011	9,82E-12	0,010
124	2	0,2	500	07.02.2011	Filtration	UC-Digest	437	Cd 111(LR)	0,01	5,3	0,0009	7,68E-12	0,008
125	3	0,2	200	07.02.2011	Filtration	UC-Digest	438	Cd 111(LR)	0,07	3,7	0,0215	1,91E-10	0,191
126	4	0,2	200	07.02.2011	Filtration	UC-Digest	439	Cd 111(LR)	0,03	5,6	0,0088	7,87E-11	0,079
127	5	0,2	200	07.02.2011	Filtration	UC-Digest	440	Cd 111(LR)	0,02	4,8	0,0052	4,62E-11	0,046
128	6	0,2	500	08.02.2011	Filtration	UC-Digest	441	Cd 111(LR)	0,01	16,0	0,0009	8,19E-12	0,008
129	7	0,2	500	08.02.2011	Filtration	UC-Digest	442	Cd 111(LR)	0,01	8,7	0,0013	1,13E-11	0,011
130	8	0,2	300	08.02.2011	Filtration	UC-Digest	443	Cd 111(LR)	0,02	4,8	0,0049	4,35E-11	0,044
131	9	0,2	200	08.02.2011	Filtration	UC-Digest	444	Cd 111(LR)	0,02	8,4	0,0048	4,27E-11	0,043
132	10	0,2	200	08.02.2011	Filtration	UC-Digest	445	Cd 111(LR)	0,03	10,4	0,0076	6,73E-11	0,067
133	1	0,2	500	10.02.2011	Filtration	UC-Digest	446	Cd 111(LR)	0,01	7,1	0,0015	1,37E-11	0,014
134	2	0,2	500	10.02.2011	Filtration	UC-Digest	447	Cd 111(LR)	0,02	4,0	0,0022	1,95E-11	0,020
135	3	0,2	200	10.02.2011	Filtration	UC-Digest	448	Cd 111(LR)	0,04	2,2	0,0126	1,12E-10	0,112
136	4	0,2	200	10.02.2011	Filtration	UC-Digest	449	Cd 111(LR)	0,03	5,0	0,0100	8,93E-11	0,089
137	5	0,2	200	10.02.2011	Filtration	UC-Digest	450	Cd 111(LR)	0,03	9,3	0,0082	7,26E-11	0,073
138	6	0,2	500	11.02.2011	Filtration	UC-Digest	451	Cd 111(LR)	0,01	7,7	0,0011	1,02E-11	0,010
139	7	0,2	500	11.02.2011	Filtration	UC-Digest	452	Cd 111(LR)	0,03	3,8	0,0040	3,53E-11	0,035
140	8	0,2	200	11.02.2011	Filtration	UC-Digest	453	Cd 111(LR)	0,03	2,1	0,0102	9,07E-11	0,091
141	9	0,2	200	11.02.2011	Filtration	UC-Digest	454	Cd 111(LR)	0,07	6,5	0,0203	1,80E-10	0,180
142	10	0,2	200	11.02.2011	Filtration	UC-Digest	455	Cd 111(LR)	0,05	7,5	0,0148	1,31E-10	0,131
67	5	0,2	400	01.02.2011	Filtration	UC-Digest	517	Cd 111(LR)	0,12	4,6	0,0180	1,60E-10	0,160

Table C4: Results sheet Size fractionation; cadmium

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
13	1	140	-	29.01.2011	Filtration	UC-Digest	326	Cd 111(LR)	-	-	-	-	-
14	1	20	1960	29.01.2011	Filtration	UC-Digest	327	Cd 111(LR)	0,009	13,2	0,0003	2,46E-12	0,002
15	1	10	600	29.01.2011	Filtration	UC-Digest	328	Cd 111(LR)	0,002	62,5	0,0002	1,75E-12	0,002
16	1	2	600	29.01.2011	Filtration	UC-Digest	329	Cd 111(LR)	0,003	15,7	0,0003	3,01E-12	0,003
17	1	0,2	450	29.01.2011	Filtration	UC-Digest	330	Cd 111(LR)	0,002	21,0	0,0003	2,69E-12	0,003
18	2	140	2100	29.01.2011	Filtration	UC-Digest	331	Cd 111(LR)	0,007	11,0	0,0002	1,68E-12	0,002
19	2	20	2100	29.01.2011	Filtration	UC-Digest	332	Cd 111(LR)	0,011	4,1	0,0003	2,85E-12	0,003
20	2	10	600	29.01.2011	Filtration	UC-Digest	333	Cd 111(LR)	0,001	77,9	0,0001	1,24E-12	0,001
21	2	2	550	29.01.2011	Filtration	UC-Digest	334	Cd 111(LR)	0,003	62,7	0,0003	2,62E-12	0,003
22	2	0,2	500	29.01.2011	Filtration	UC-Digest	335	Cd 111(LR)	0,007	12,5	0,0008	7,22E-12	0,007
23	3	140	2000	29.01.2011	Filtration	UC-Digest	336	Cd 111(LR)	0,019	31,1	0,0006	5,17E-12	0,005
24	3	20	-	29.01.2011	Filtration	UC-Digest	337	Cd 111(LR)	-	-	-	-	-
25	3	10	600	29.01.2011	Filtration	UC-Digest	338	Cd 111(LR)	0,005	27,0	0,0005	4,18E-12	0,004
26	3	2	600	29.01.2011	Filtration	UC-Digest	339	Cd 111(LR)	-	-	-	-	-
27	3	0,2	450	29.01.2011	Filtration	UC-Digest	340	Cd 111(LR)	0,012	13,9	0,0017	1,48E-11	0,015
28	4	140	2000	29.01.2011	Filtration	UC-Digest	341	Cd 111(LR)	0,028	6,8	0,0008	7,53E-12	0,008
29	4	20	2000	29.01.2011	Filtration	UC-Digest	342	Cd 111(LR)	0,056	3,6	0,0017	1,51E-11	0,015
30	4	10	600	29.01.2011	Filtration	UC-Digest	343	Cd 111(LR)	0,002	10,5	0,0002	1,67E-12	0,002
31	4	2	600	29.01.2011	Filtration	UC-Digest	344	Cd 111(LR)	0,006	27,4	0,0006	5,31E-12	0,005
32	4	0,2	450	29.01.2011	Filtration	UC-Digest	345	Cd 111(LR)	0,009	6,0	0,0012	1,06E-11	0,011
33	5	140	2000	29.01.2011	Filtration	UC-Digest	346	Cd 111(LR)	0,065	8,5	0,0019	1,73E-11	0,017
34	5	20	2000	29.01.2011	Filtration	UC-Digest	347	Cd 111(LR)	0,043	4,3	0,0013	1,15E-11	0,011
35	5	10	600	29.01.2011	Filtration	UC-Digest	348	Cd 111(LR)	0,002	23,7	0,0002	2,12E-12	0,002
36	5	2	600	29.01.2011	Filtration	UC-Digest	349	Cd 111(LR)	0,002	50,9	0,0002	2,20E-12	0,002
37	5	0,2	450	29.01.2011	Filtration	UC-Digest	350	Cd 111(LR)	0,006	19,8	0,0008	7,25E-12	0,007
38	6	140	2000	30.01.2011	Filtration	UC-Digest	351	Cd 111(LR)	0,024	7,2	0,0007	6,43E-12	0,006
39	6	20	2000	30.01.2011	Filtration	UC-Digest	352	Cd 111(LR)	0,007	37,2	0,0002	1,84E-12	0,002
40	6	10	550	30.01.2011	Filtration	UC-Digest	353	Cd 111(LR)	0,002	126,3	0,0002	1,84E-12	0,002

41	6	2	550	30.01.2011	Filtration	UC-Digest	354	Cd 111(LR)	0,001	58,3	0,0001	9,80E-13	0,001
42	6	0,2	450	30.01.2011	Filtration	UC-Digest	355	Cd 111(LR)	0,005	27,5	0,0007	6,46E-12	0,006
43	7	140	2000	30.01.2011	Filtration	UC-Digest	356	Cd 111(LR)	0,021	16,3	0,0006	5,70E-12	0,006
44	7	20	2000	30.01.2011	Filtration	UC-Digest	357	Cd 111(LR)	0,016	11,0	0,0005	4,40E-12	0,004
45	7	10	350	30.01.2011	Filtration	UC-Digest	358	Cd 111(LR)	0,002	65,1	0,0004	3,61E-12	0,004
46	7	2	350	30.01.2011	Filtration	UC-Digest	359	Cd 111(LR)	0,002	73,0	0,0003	2,96E-12	0,003
47	7	0,2	350	30.01.2011	Filtration	UC-Digest	360	Cd 111(LR)	0,002	54,4	0,0004	3,56E-12	0,004
48	8	140	2000	30.01.2011	Filtration	UC-Digest	361	Cd 111(LR)	0,038	1,7	0,0011	1,02E-11	0,010
49	8	20	2000	30.01.2011	Filtration	UC-Digest	362	Cd 111(LR)	0,026	9,1	0,0008	7,00E-12	0,007
50	8	10	600	30.01.2011	Filtration	UC-Digest	363	Cd 111(LR)	0,004	17,9	0,0004	3,99E-12	0,004
51	8	2	400	30.01.2011	Filtration	UC-Digest	364	Cd 111(LR)	0,006	24,5	0,0010	8,58E-12	0,009
52	8	0,2	400	30.01.2011	Filtration	UC-Digest	516	Cd 111(LR)	0,006	12,2	0,0009	8,38E-12	0,008
53	9	140	2000	30.01.2011	Filtration	UC-Digest	366	Cd 111(LR)	0,054	4,2	0,0016	1,44E-11	0,014
54	9	20	2000	30.01.2011	Filtration	UC-Digest	367	Cd 111(LR)	0,028	7,1	0,0009	7,61E-12	0,008
55	9	10	600	30.01.2011	Filtration	UC-Digest	368	Cd 111(LR)	0,003	7,7	0,0003	2,58E-12	0,003
56	9	2	400	30.01.2011	Filtration	UC-Digest	369	Cd 111(LR)	0,003	17,1	0,0004	3,56E-12	0,004
57	9	0,2	400	30.01.2011	Filtration	UC-Digest	370	Cd 111(LR)	0,008	20,4	0,0011	1,02E-11	0,010
58	10	140	2000	30.01.2011	Filtration	UC-Digest	371	Cd 111(LR)	0,090	3,5	0,0027	2,41E-11	0,024
59	10	20	2000	30.01.2011	Filtration	UC-Digest	372	Cd 111(LR)	0,015	2,9	0,0004	3,96E-12	0,004
60	10	10	600	30.01.2011	Filtration	UC-Digest	373	Cd 111(LR)	0,005	12,3	0,0005	4,12E-12	0,004
61	10	2	375	30.01.2011	Filtration	UC-Digest	374	Cd 111(LR)	0,007	33,9	0,0011	9,96E-12	0,010
62	10	0,2	375	30.01.2011	Filtration	UC-Digest	375	Cd 111(LR)	0,005	18,8	0,0007	6,61E-12	0,007
73	1	140	2000	04.02.2011	Filtration	UC-Digest	386	Cd 111(LR)	0,021	7,8	0,0006	5,52E-12	0,006
74	1	20	2000	04.02.2011	Filtration	UC-Digest	387	Cd 111(LR)	0,015	6,6	0,0005	4,03E-12	0,004
75	1	10	600	04.02.2011	Filtration	UC-Digest	388	Cd 111(LR)	0,0004	53,6	0,0000	3,45E-13	0,000
76	1	2	600	04.02.2011	Filtration	UC-Digest	389	Cd 111(LR)	0,002	16,0	0,0002	1,55E-12	0,002
77	1	0,2	600	04.02.2011	Filtration	UC-Digest	390	Cd 111(LR)	0,001	39,7	0,0001	7,57E-13	0,001
78	2	140	2000	04.02.2011	Filtration	UC-Digest	391	Cd 111(LR)	0,012	11,5	0,0003	3,09E-12	0,003
79	2	20	2000	04.02.2011	Filtration	UC-Digest	392	Cd 111(LR)	0,025	8,1	0,0007	6,60E-12	0,007
80	2	10	600	04.02.2011	Filtration	UC-Digest	393	Cd 111(LR)	0,007	6,8	0,0007	5,90E-12	0,006
81	2	2	550	04.02.2011	Filtration	UC-Digest	394	Cd 111(LR)	0,001	90,5	0,0001	1,24E-12	0,001
82	2	0,2	500	04.02.2011	Filtration	UC-Digest	395	Cd 111(LR)	0,003	44,4	0,0003	2,74E-12	0,003
83	3	140	2000	04.02.2011	Filtration	UC-Digest	396	Cd 111(LR)	0,078	3,2	0,0024	2,09E-11	0,021
84	3	20	2000	04.02.2011	Filtration	UC-Digest	397	Cd 111(LR)	0,151	1,5	0,0045	4,04E-11	0,040

85	3	10	2000	04.02.2011	Filtration	UC-Digest	398	Cd 111(LR)	0,009	5,9	0,0003	2,32E-12	0,002
86	3	2	300	04.02.2011	Filtration	UC-Digest	399	Cd 111(LR)	0,003	18,4	0,0007	6,18E-12	0,006
87	3	0,2	300	04.02.2011	Filtration	UC-Digest	400	Cd 111(LR)	0,001	25,7	0,0003	2,46E-12	0,002
88	4	140	2000	04.02.2011	Filtration	UC-Digest	401	Cd 111(LR)	0,095	2,5	0,0028	2,53E-11	0,025
89	4	20	1000	04.02.2011	Filtration	UC-Digest	402	Cd 111(LR)	0,018	3,0	0,0011	9,70E-12	0,010
90	4	10	350	04.02.2011	Filtration	UC-Digest	403	Cd 111(LR)	0,002	34,7	0,0003	3,10E-12	0,003
91	4	2	300	04.02.2011	Filtration	UC-Digest	404	Cd 111(LR)	0,002	33,1	0,0004	3,21E-12	0,003
92	4	0,2	300	04.02.2011	Filtration	UC-Digest	405	Cd 111(LR)	0,003	21,2	0,0006	4,97E-12	0,005
93	5	140	1000	04.02.2011	Filtration	UC-Digest	406	Cd 111(LR)	0,018	7,9	0,0011	9,82E-12	0,010
94	5	20	1000	04.02.2011	Filtration	UC-Digest	407	Cd 111(LR)	0,038	3,8	0,0023	2,03E-11	0,020
95	5	10	250	04.02.2011	Filtration	UC-Digest	408	Cd 111(LR)	0,004	4,9	0,0009	8,34E-12	0,008
96	5	2	200	04.02.2011	Filtration	UC-Digest	409	Cd 111(LR)	0,003	13,0	0,0009	7,97E-12	0,008
97	5	0,2	200	04.02.2011	Filtration	UC-Digest	410	Cd 111(LR)	0,003	7,7	0,0008	7,46E-12	0,007
98	6	140	2000	05.02.2011	Filtration	UC-Digest	411	Cd 111(LR)	0,013	4,2	0,0004	3,55E-12	0,004
99	6	20	2000	05.02.2011	Filtration	UC-Digest	412	Cd 111(LR)	0,013	5,3	0,0004	3,47E-12	0,003
100	6	10	600	05.02.2011	Filtration	UC-Digest	413	Cd 111(LR)	0,002	21,2	0,0002	1,35E-12	0,001
101	6	2	400	05.02.2011	Filtration	UC-Digest	414	Cd 111(LR)	0,001	43,3	0,0002	1,84E-12	0,002
102	6	0,2	200	05.02.2011	Filtration	UC-Digest	415	Cd 111(LR)	0,002	1,1	0,0007	6,39E-12	0,006
103	7	140	2000	05.02.2011	Filtration	UC-Digest	416	Cd 111(LR)	0,022	4,2	0,0007	5,89E-12	0,006
104	7	20	1000	05.02.2011	Filtration	UC-Digest	417	Cd 111(LR)	0,003	11,1	0,0002	1,66E-12	0,002
105	7	10	400	05.02.2011	Filtration	UC-Digest	418	Cd 111(LR)	0,002	14,1	0,0004	3,24E-12	0,003
106	7	2	300	05.02.2011	Filtration	UC-Digest	419	Cd 111(LR)	0,002	7,5	0,0004	3,39E-12	0,003
107	7	0,2	200	05.02.2011	Filtration	UC-Digest	420	Cd 111(LR)	0,002	28,6	0,0007	5,82E-12	0,006
108	8	140	2000	05.02.2011	Filtration	UC-Digest	421	Cd 111(LR)	0,065	4,9	0,0019	1,72E-11	0,017
109	8	20	1000	05.02.2011	Filtration	UC-Digest	422	Cd 111(LR)	0,060	4,8	0,0036	3,18E-11	0,032
110	8	10	350	05.02.2011	Filtration	UC-Digest	423	Cd 111(LR)	0,014	4,1	0,0023	2,07E-11	0,021
111	8	2	200	05.02.2011	Filtration	UC-Digest	424	Cd 111(LR)	0,002	21,2	0,0006	5,32E-12	0,005
112	8	0,2	200	05.02.2011	Filtration	UC-Digest	425	Cd 111(LR)	0,004	5,2	0,0011	1,00E-11	0,010
113	9	140	2000	05.02.2011	Filtration	UC-Digest	426	Cd 111(LR)	0,116	2,8	0,0035	3,10E-11	0,031
114	9	20	1000	05.02.2011	Filtration	UC-Digest	427	Cd 111(LR)	0,088	0,5	0,0053	4,72E-11	0,047
115	9	10	350	05.02.2011	Filtration	UC-Digest	428	Cd 111(LR)	0,001	13,4	0,0002	1,81E-12	0,002
116	9	2	200	05.02.2011	Filtration	UC-Digest	429	Cd 111(LR)	0,002	23,6	0,0006	5,05E-12	0,005
117	9	0,2	200	05.02.2011	Filtration	UC-Digest	430	Cd 111(LR)	0,005	21,5	0,0014	1,25E-11	0,013
118	10	140	1000	05.02.2011	Filtration	UC-Digest	431	Cd 111(LR)	0,099	2,1	0,0061	5,40E-11	0,054

119	10	20	500	05.02.2011	Filtration	UC-Digest	432	Cd 111(LR)	0,092	1,6	0,0110	9,80E-11	0,098
120	10	10	350	05.02.2011	Filtration	UC-Digest	433	Cd 111(LR)	0,008	18,5	0,0013	1,18E-11	0,012
121	10	2	200	05.02.2011	Filtration	UC-Digest	434	Cd 111(LR)	0,002	20,5	0,0007	6,64E-12	0,007
122	10	0,2	120	05.02.2011	Filtration	UC-Digest	435	Cd 111(LR)	0,002	11,0	0,0012	1,10E-11	0,011
143	1	140	2000	13.02.2011	Filtration	UC-Digest	456	Cd 111(LR)	0,005	10,9	0,0001	1,27E-12	0,001
144	1	20	2000	13.02.2011	Filtration	UC-Digest	457	Cd 111(LR)	0,004	24,9	0,0001	1,01E-12	0,001
145	1	10	600	13.02.2011	Filtration	UC-Digest	458	Cd 111(LR)	0,001	98,4	0,0001	7,81E-13	0,001
146	1	2	400	13.02.2011	Filtration	UC-Digest	459	Cd 111(LR)	0,001	25,6	0,0001	1,31E-12	0,001
147	1	0,2	400	13.02.2011	Filtration	UC-Digest	460	Cd 111(LR)	0,001	39,8	0,0002	1,97E-12	0,002
148	2	140	2000	13.02.2011	Filtration	UC-Digest	461	Cd 111(LR)	0,011	5,3	0,0003	3,06E-12	0,003
149	2	20	2000	13.02.2011	Filtration	UC-Digest	462	Cd 111(LR)	0,022	7,9	0,0007	5,90E-12	0,006
150	2	10	400	13.02.2011	Filtration	UC-Digest	463	Cd 111(LR)	0,001	39,8	0,0002	1,43E-12	0,001
151	2	2	300	13.02.2011	Filtration	UC-Digest	464	Cd 111(LR)	0,003	25,2	0,0006	4,93E-12	0,005
152	2	0,2	200	13.02.2011	Filtration	UC-Digest	465	Cd 111(LR)	0,001	16,2	0,0003	2,83E-12	0,003
153	3	140	2000	13.02.2011	Filtration	UC-Digest	466	Cd 111(LR)	0,288	1,8	0,0087	7,70E-11	0,077
154	3	20	1000	13.02.2011	Filtration	UC-Digest	467	Cd 111(LR)	0,036	10,5	0,0022	1,93E-11	0,019
155	3	10	250	13.02.2011	Filtration	UC-Digest	468	Cd 111(LR)	0,003	10,0	0,0008	7,43E-12	0,007
156	3	2	150	13.02.2011	Filtration	UC-Digest	469	Cd 111(LR)	0,002	16,5	0,0008	7,03E-12	0,007
157	3	0,2	150	13.02.2011	Filtration	UC-Digest	470	Cd 111(LR)	0,001	42,9	0,0003	2,93E-12	0,003
158	4	140	2000	13.02.2011	Filtration	UC-Digest	471	Cd 111(LR)	0,058	6,2	0,0018	1,56E-11	0,016
159	4	20	1000	13.02.2011	Filtration	UC-Digest	472	Cd 111(LR)	0,040	1,3	0,0024	2,14E-11	0,021
160	4	10	250	13.02.2011	Filtration	UC-Digest	473	Cd 111(LR)	0,001	55,6	0,0001	1,25E-12	0,001
161	4	2	250	13.02.2011	Filtration	UC-Digest	474	Cd 111(LR)	0,004	9,3	0,0009	7,96E-12	0,008
162	4	0,2	200	13.02.2011	Filtration	UC-Digest	475	Cd 111(LR)	0,005	9,2	0,0016	1,39E-11	0,014
163	5	140	2000	13.02.2011	Filtration	UC-Digest	476	Cd 111(LR)	0,064	1,7	0,0019	1,72E-11	0,017
164	5	20	500	13.02.2011	Filtration	UC-Digest	477	Cd 111(LR)	0,057	5,9	0,0070	6,23E-11	0,062
165	5	10	200	13.02.2011	Filtration	UC-Digest	478	Cd 111(LR)	0,001	14,4	0,0002	2,05E-12	0,002
166	5	2	200	13.02.2011	Filtration	UC-Digest	479	Cd 111(LR)	0,005	19,5	0,0016	1,40E-11	0,014
167	5	0,2	200	13.02.2011	Filtration	UC-Digest	480	Cd 111(LR)	0,002	15,7	0,0005	4,17E-12	0,004
168	6	140	2000	14.02.2011	Filtration	UC-Digest	481	Cd 111(LR)	0,004	8,7	0,0001	1,04E-12	0,001
169	6	20	1000	14.02.2011	Filtration	UC-Digest	482	Cd 111(LR)	0,002	31,9	0,0001	1,23E-12	0,001
170	6	10	500	14.02.2011	Filtration	UC-Digest	483	Cd 111(LR)	0,0004	32,7	0,0000	4,02E-13	0,000
171	6	2	300	14.02.2011	Filtration	UC-Digest	484	Cd 111(LR)	0,0005	45,2	0,0001	8,65E-13	0,001
172	6	0,2	300	14.02.2011	Filtration	UC-Digest	485	Cd 111(LR)	0,001	24,8	0,0003	2,43E-12	0,002

173	7	140	2000	14.02.2011	Filtration	UC-Digest	486	Cd 111(LR)	0,009	11,4	0,0003	2,53E-12	0,003
174	7	20	1000	14.02.2011	Filtration	UC-Digest	487	Cd 111(LR)	0,017	3,3	0,0010	8,86E-12	0,009
175	7	10	395	14.02.2011	Filtration	UC-Digest	488	Cd 111(LR)	0,002	10,9	0,0002	2,17E-12	0,002
176	7	2	200	14.02.2011	Filtration	UC-Digest	489	Cd 111(LR)	0,001	11,6	0,0004	3,47E-12	0,003
177	7	0,2	200	14.02.2011	Filtration	UC-Digest	490	Cd 111(LR)	0,003	9,7	0,0009	7,76E-12	0,008
178	8	140	2000	14.02.2011	Filtration	UC-Digest	491	Cd 111(LR)	0,069	5,5	0,0021	1,85E-11	0,019
179	8	20	1000	14.02.2011	Filtration	UC-Digest	492	Cd 111(LR)	0,064	1,3	0,0038	3,39E-11	0,034
180	8	10	300	14.02.2011	Filtration	UC-Digest	493	Cd 111(LR)	0,003	32,4	0,0005	4,67E-12	0,005
181	8	2	100	14.02.2011	Filtration	UC-Digest	494	Cd 111(LR)	0,002	17,7	0,0009	8,08E-12	0,008
182	8	0,2	200	14.02.2011	Filtration	UC-Digest	495	Cd 111(LR)	0,001	12,4	0,0004	3,44E-12	0,003
183	9	140	2000	14.02.2011	Filtration	UC-Digest	496	Cd 111(LR)	0,154	2,7	0,0046	4,12E-11	0,041
184	9	20	1000	14.02.2011	Filtration	UC-Digest	497	Cd 111(LR)	0,103	3,9	0,0062	5,50E-11	0,055
185	9	10	150	14.02.2011	Filtration	UC-Digest	498	Cd 111(LR)	0,016	13,6	0,0063	5,64E-11	0,056
186	9	2	150	14.02.2011	Filtration	UC-Digest	499	Cd 111(LR)	-	-	-	-	-
187	9	0,2	150	14.02.2011	Filtration	UC-Digest	500	Cd 111(LR)	0,004	4,3	0,0015	1,37E-11	0,014
188	10	140	1500	14.02.2011	Filtration	UC-Digest	501	Cd 111(LR)	0,035	1,4	0,0014	1,25E-11	0,012
189	10	20	500	14.02.2011	Filtration	UC-Digest	502	Cd 111(LR)	0,065	4,9	0,0078	6,97E-11	0,070
190	10	10	130	14.02.2011	Filtration	UC-Digest	503	Cd 111(LR)	0,004	8,8	0,0019	1,72E-11	0,017
191	10	2	55	14.02.2011	Filtration	UC-Digest	504	Cd 111(LR)	0,004	17,3	0,0042	3,73E-11	0,037
192	10	0,2	55	14.02.2011	Filtration	UC-Digest	505	Cd 111(LR)	0,002	6,1	0,0026	2,27E-11	0,023

Table C5: Results sheet Direct samples; cadmium

								Concentration				
								Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
1	10 m	P	23.01.2011	Depth	Direct	529	Cd 111(LR)	0,008	4,0	8,01E-05	7,12E-13	0,0007
1	10 m	P	23.01.2011	Depth	Direct	529	Cd 111(LR)	0,008	2,4	8,19E-05	7,28E-13	0,0007
3	10 m	D	23.01.2011	Depth	Direct	530	Cd 111(LR)	0,005	3,9	4,96E-05	4,41E-13	0,0004
5	5	P	23.01.2011	Tank	Direct	531	Cd 111(LR)	0,002	7,1	2,00E-05	1,78E-13	0,0002
7	5	D	23.01.2011	Tank	Direct	532	Cd 111(LR)	0,003	1,0	3,18E-05	2,83E-13	0,0003

9	Brk	P	24.01.2011	Depth	Direct	533	Cd 111(LR)	0,012	3,9	1,22E-04	1,09E-12	0,00109
11	Brk	D	24.01.2011	Depth	Direct	534	Cd 111(LR)	0,003	7,7	3,28E-05	2,92E-13	0,00029
13	1	P	26.01.2011	Tank	Direct	535	Cd 111(LR)	0,002	6,0	2,06E-05	1,83E-13	0,00018
15	1	D	26.01.2011	Tank	Direct	536	Cd 111(LR)	0,000	9,0	-9,76E-07	-8,69E-15	-0,00001
17	2	P	26.01.2011	Tank	Direct	537	Cd 111(LR)	0,003	7,4	2,88E-05	2,57E-13	0,00026
19	2	D	26.01.2011	Tank	Direct	538	Cd 111(LR)	0,001	8,1	1,12E-05	9,93E-14	0,00010
21	3	P	26.01.2011	Tank	Direct	539	Cd 111(LR)	0,003	6,4	3,29E-05	2,93E-13	0,00029
23	3	D	26.01.2011	Tank	Direct	540	Cd 111(LR)	0,007	26,0	7,45E-05	6,63E-13	0,00066
23	3	D	23.01.2011	Tank	Direct		Cd 111(LR)	0,001	15,9	1,36E-05	1,21E-13	0,00012
25	4	P	26.01.2011	Tank	Direct	541	Cd 111(LR)	0,003	5,1	2,61E-05	2,32E-13	0,00023
27	4	D	26.01.2011	Tank	Direct	542	Cd 111(LR)	0,004	11,4	3,74E-05	3,33E-13	0,00033
29	5	P	26.01.2011	Tank	Direct	543	Cd 111(LR)	0,004	14,5	3,63E-05	3,23E-13	0,00032
31	5	D	26.01.2011	Tank	Direct	544	Cd 111(LR)	0,004	10,8	3,53E-05	3,14E-13	0,00031
33	6	P	27.01.2011	Tank	Direct	545	Cd 111(LR)	0,003	2,0	3,08E-05	2,74E-13	0,00027
35	6	D	27.01.2011	Tank	Direct	546	Cd 111(LR)	0,005	28,5	4,71E-05	4,19E-13	0,00042
37	7	P	27.01.2011	Tank	Direct	547	Cd 111(LR)	0,006	3,1	5,66E-05	5,03E-13	0,00050
39	7	D	27.01.2011	Tank	Direct	548	Cd 111(LR)	0,006	12,1	6,39E-05	5,68E-13	0,00057
41	8	P	27.01.2011	Tank	Direct	549	Cd 111(LR)	0,005	13,6	5,18E-05	4,61E-13	0,00046
43	8	D	27.01.2011	Tank	Direct	550	Cd 111(LR)	0,004	14,5	4,40E-05	3,91E-13	0,00039
45	9	P	27.01.2011	Tank	Direct	551	Cd 111(LR)	0,007	8,4	6,71E-05	5,97E-13	0,00060
47	9	D	27.01.2011	Tank	Direct	552	Cd 111(LR)	0,006	13,3	5,56E-05	4,95E-13	0,00049
49	10	P	27.01.2011	Tank	Direct	553	Cd 111(LR)	0,006	7,1	5,65E-05	5,03E-13	0,00050
51	10	D	27.01.2011	Tank	Direct	554	Cd 111(LR)	0,002	6,1	2,44E-05	2,17E-13	0,00022
53	1	P	29.01.2011	Tank	Direct	555	Cd 111(LR)	0,008	16,4	8,07E-05	7,18E-13	0,00072
55	1	D	29.01.2011	Tank	Direct	556	Cd 111(LR)	0,005	5,1	4,83E-05	4,30E-13	0,00043
57	2	P	29.01.2011	Tank	Direct	557	Cd 111(LR)	0,001	9,1	1,46E-05	1,30E-13	0,00013
59	2	D	29.01.2011	Tank	Direct	558	Cd 111(LR)	0,006	12,1	5,95E-05	5,30E-13	0,00053
61	3	P	29.01.2011	Tank	Direct	559	Cd 111(LR)	0,007	14,7	7,49E-05	6,66E-13	0,00067
63	3	D	29.01.2011	Tank	Direct	560	Cd 111(LR)	0,004	13,4	4,26E-05	3,79E-13	0,00038

65	4	P	29.01.2011	Tank	Direct	561	Cd 111(LR)	0,007	8,2	6,65E-05	5,91E-13	0,00059
67	4	D	29.01.2011	Tank	Direct	562	Cd 111(LR)	0,005	11,9	5,09E-05	4,53E-13	0,00045
69	5	P	29.01.2011	Tank	Direct	563	Cd 111(LR)	0,006	3,5	6,43E-05	5,72E-13	0,00057
71	5	D	29.01.2011	Tank	Direct	564	Cd 111(LR)	0,004	13,9	3,85E-05	3,42E-13	0,00034
73	6	P	30.01.2011	Tank	Direct	565	Cd 111(LR)	0,007	7,4	7,30E-05	6,49E-13	0,00065
75	6	D	30.01.2011	Tank	Direct	566	Cd 111(LR)	0,007	17,4	7,48E-05	6,65E-13	0,00067
77	7	P	30.01.2011	Tank	Direct	567	Cd 111(LR)	0,008	4,0	7,75E-05	6,90E-13	0,00069
79	7	D	30.01.2011	Tank	Direct	568	Cd 111(LR)	0,006	7,0	6,07E-05	5,40E-13	0,00054
81	8	P	30.01.2011	Tank	Direct	569	Cd 111(LR)	0,006	17,5	6,42E-05	5,71E-13	0,00057
83	8	D	30.01.2011	Tank	Direct	570	Cd 111(LR)	0,005	7,9	4,88E-05	4,34E-13	0,00043
85	9	P	30.01.2011	Tank	Direct	571	Cd 111(LR)	0,008	10,2	8,50E-05	7,56E-13	0,00076
87	9	D	30.01.2011	Tank	Direct	572	Cd 111(LR)	0,007	0,7	6,69E-05	5,95E-13	0,00060
89	10	P	30.01.2011	Tank	Direct	573	Cd 111(LR)	0,006	12,8	6,31E-05	5,61E-13	0,00056
91	10	D	30.01.2011	Tank	Direct	574	Cd 111(LR)	0,003	22,5	3,48E-05	3,10E-13	0,00031
93	1	P	01.02.2011	Tank	Direct	575	Cd 111(LR)	0,004	2,5	3,52E-05	3,13E-13	0,00031
95	1	D	01.02.2011	Tank	Direct	576	Cd 111(LR)	0,005	13,3	5,34E-05	4,75E-13	0,00047
97	2	P	01.02.2011	Tank	Direct	577	Cd 111(LR)	0,004	16,5	3,54E-05	3,15E-13	0,00031
99	2	D	01.02.2011	Tank	Direct	578	Cd 111(LR)	0,006	13,2	5,92E-05	5,26E-13	0,00053
101	3	P	01.02.2011	Tank	Direct	579	Cd 111(LR)	0,012	9,3	1,25E-04	1,11E-12	0,00111
103	3	D	01.02.2011	Tank	Direct	580	Cd 111(LR)	0,007	9,6	7,12E-05	6,33E-13	0,00063
105	4	P	01.02.2011	Tank	Direct	581	Cd 111(LR)	0,007	5,5	6,66E-05	5,93E-13	0,00059
107	4	D	01.02.2011	Tank	Direct	582	Cd 111(LR)	0,006	9,3	5,58E-05	4,97E-13	0,00050
109	5	P	01.02.2011	Tank	Direct	583	Cd 111(LR)	0,008	15,4	7,84E-05	6,97E-13	0,00070
111	5	D	01.02.2011	Tank	Direct	584	Cd 111(LR)	0,007	9,8	6,83E-05	6,08E-13	0,00061
113	6	P	02.02.2011	Tank	Direct	585	Cd 111(LR)	0,010	16,8	1,03E-04	9,21E-13	0,00092
115	6	D	02.02.2011	Tank	Direct	586	Cd 111(LR)	0,011	7,5	1,11E-04	9,83E-13	0,00098
117	7	P	02.02.2011	Tank	Direct	587	Cd 111(LR)	0,010	10,4	9,84E-05	8,76E-13	0,00088
119	7	D	02.02.2011	Tank	Direct	588	Cd 111(LR)	0,007	5,9	6,78E-05	6,03E-13	0,00060
121	8	P	02.02.2011	Tank	Direct	589	Cd 111(LR)	0,012	1,5	1,19E-04	1,06E-12	0,00106

123	8	D	02.02.2011	Tank	Direct	590	Cd 111(LR)	0,007	8,4	7,27E-05	6,46E-13	0,00065
125	9	P	02.02.2011	Tank	Direct	591	Cd 111(LR)	0,010	1,3	1,02E-04	9,05E-13	0,00090
127	9	D	02.02.2011	Tank	Direct	592	Cd 111(LR)	0,008	1,4	7,69E-05	6,84E-13	0,00068
129	10	P	02.02.2011	Tank	Direct	593	Cd 111(LR)	0,010	11,9	9,88E-05	8,79E-13	0,00088
131	10	D	02.02.2011	Tank	Direct	594	Cd 111(LR)	0,005	3,6	4,87E-05	4,34E-13	0,00043
133	1	P	04.02.2011	Tank	Direct	595	Cd 111(LR)	0,011	15,3	1,11E-04	9,83E-13	0,00098
135	1	D	04.02.2011	Tank	Direct	596	Cd 111(LR)	0,009	9,6	9,50E-05	8,45E-13	0,00084
137	2	P	04.02.2011	Tank	Direct	597	Cd 111(LR)	0,009	7,3	9,06E-05	8,06E-13	0,00081
139	2	D	04.02.2011	Tank	Direct	598	Cd 111(LR)	0,009	5,6	9,50E-05	8,45E-13	0,00084
141	3	P	04.02.2011	Tank	Direct	599	Cd 111(LR)	0,012	4,1	1,25E-04	1,11E-12	0,00111
143	3	D	04.02.2011	Tank	Direct	600	Cd 111(LR)	0,007	2,5	7,12E-05	6,33E-13	0,00063
145	4	P	04.02.2011	Tank	Direct	601	Cd 111(LR)	0,013	9,5	1,31E-04	1,16E-12	0,00116
147	4	D	04.02.2011	Tank	Direct	602	Cd 111(LR)	0,009	9,3	9,49E-05	8,45E-13	0,00084
149	5	P	04.02.2011	Tank	Direct	603	Cd 111(LR)	0,010	8,6	9,78E-05	8,70E-13	0,00087
151	5	D	04.02.2011	Tank	Direct	604	Cd 111(LR)	0,010	11,8	1,03E-04	9,20E-13	0,00092
153	6	P	05.02.2011	Tank	Direct	605	Cd 111(LR)	0,012	10,1	1,23E-04	1,10E-12	0,00110
154	6	D	05.02.2011	Tank	Direct	606	Cd 111(LR)	0,029	14,1	2,92E-04	2,60E-12	0,00260
155	7	P	05.02.2011	Tank	Direct	607	Cd 111(LR)	0,012	8,9	1,25E-04	1,11E-12	0,00111
156	7	D	05.02.2011	Tank	Direct	608	Cd 111(LR)	0,014	9,4	1,42E-04	1,26E-12	0,00126
157	8	P	05.02.2011	Tank	Direct	609	Cd 111(LR)	0,009	13,2	8,60E-05	7,65E-13	0,00077
158	8	D	05.02.2011	Tank	Direct	610	Cd 111(LR)	0,007	18,0	6,78E-05	6,03E-13	0,00060
159	9	P	05.02.2011	Tank	Direct	611	Cd 111(LR)	0,011	7,7	1,07E-04	9,55E-13	0,00096
160	9	D	05.02.2011	Tank	Direct	612	Cd 111(LR)	0,008	7,4	7,96E-05	7,08E-13	0,00071
161	10	P	05.02.2011	Tank	Direct	613	Cd 111(LR)	0,009	10,3	8,53E-05	7,59E-13	0,00076
162	10	D	05.02.2011	Tank	Direct	614	Cd 111(LR)	0,008	30,4	7,68E-05	6,84E-13	0,00068
163	1	P	07.02.2011	Tank	Direct	615	Cd 111(LR)	0,007	14,1	6,64E-05	5,90E-13	0,00059
164	1	D	07.02.2011	Tank	Direct	616	Cd 111(LR)	0,022	26,0	2,22E-04	1,98E-12	0,00198
165	2	P	07.02.2011	Tank	Direct	617	Cd 111(LR)	0,006	7,3	6,02E-05	5,36E-13	0,00054
166	2	D	07.02.2011	Tank	Direct	618	Cd 111(LR)	0,008	5,1	8,06E-05	7,17E-13	0,00072

167	3	P	07.02.2011	Tank	Direct	619	Cd 111(LR)	0,009	1,7	8,97E-05	7,98E-13	0,00080
168	3	D	07.02.2011	Tank	Direct	620	Cd 111(LR)	0,009	10,5	9,33E-05	8,30E-13	0,00083
169	4	P	07.02.2011	Tank	Direct	621	Cd 111(LR)	0,008	20,9	8,03E-05	7,15E-13	0,00071
170	4	D	07.02.2011	Tank	Direct	622	Cd 111(LR)	0,011	4,4	1,07E-04	9,49E-13	0,00095
171	5	P	07.02.2011	Tank	Direct	623	Cd 111(LR)	0,012	5,0	1,21E-04	1,08E-12	0,00108
172	5	D	07.02.2011	Tank	Direct	624	Cd 111(LR)	0,009	20,2	8,64E-05	7,69E-13	0,00077
173	6	P	08.02.2011	Tank	Direct	625	Cd 111(LR)	0,010	4,2	1,02E-04	9,06E-13	0,00091
174	6	D	08.02.2011	Tank	Direct	626	Cd 111(LR)	0,012	18,7	1,17E-04	1,04E-12	0,00104
175	7	P	08.02.2011	Tank	Direct	627	Cd 111(LR)	0,009	11,4	9,35E-05	8,32E-13	0,00083
176	7	D	08.02.2011	Tank	Direct	628	Cd 111(LR)	0,012	10,1	1,21E-04	1,07E-12	0,00107
177	8	P	08.02.2011	Tank	Direct	629	Cd 111(LR)	0,012	8,4	1,15E-04	1,03E-12	0,00103
178	8	D	08.02.2011	Tank	Direct	630	Cd 111(LR)	0,106	146,6	1,06E-03	9,44E-12	0,00944
179	9	P	08.02.2011	Tank	Direct	631	Cd 111(LR)	0,010	3,6	9,81E-05	8,73E-13	0,00087
180	9	D	08.02.2011	Tank	Direct	632	Cd 111(LR)	0,011	12,8	1,06E-04	9,44E-13	0,00094
181	10	P	08.02.2011	Tank	Direct	633	Cd 111(LR)	0,011	5,1	1,10E-04	9,75E-13	0,00098
182	10	D	08.02.2011	Tank	Direct	634	Cd 111(LR)	0,012	22,8	1,21E-04	1,07E-12	0,00107
183	1	P	10.02.2011	Tank	Direct	635	Cd 111(LR)	0,010	5,2	9,77E-05	8,69E-13	0,00087
184	1	D	10.02.2011	Tank	Direct	636	Cd 111(LR)	0,011	3,1	1,07E-04	9,51E-13	0,00095
185	2	P	10.02.2011	Tank	Direct	637	Cd 111(LR)	0,012	5,2	1,18E-04	1,05E-12	0,00105
186	2	D	10.02.2011	Tank	Direct	638	Cd 111(LR)	0,013	9,5	1,28E-04	1,14E-12	0,00114
187	3	P	10.02.2011	Tank	Direct	639	Cd 111(LR)	0,008	13,4	8,01E-05	7,12E-13	0,00071
188	3	D	10.02.2011	Tank	Direct	640	Cd 111(LR)	0,007	11,8	7,08E-05	6,30E-13	0,00063
189	4	P	10.02.2011	Tank	Direct	641	Cd 111(LR)	0,009	8,2	9,07E-05	8,07E-13	0,00081
190	4	D	10.02.2011	Tank	Direct	642	Cd 111(LR)	0,005	1,5	4,66E-05	4,15E-13	0,00041
191	5	P	10.02.2011	Tank	Direct	643	Cd 111(LR)	0,008	14,9	8,43E-05	7,50E-13	0,00075
192	5	D	10.02.2011	Tank	Direct	644	Cd 111(LR)	0,006	17,2	6,02E-05	5,35E-13	0,00054
193	6	P	11.02.2011	Tank	Direct	645	Cd 111(LR)	0,010	6,8	1,02E-04	9,10E-13	0,00091
194	6	D	11.02.2011	Tank	Direct	646	Cd 111(LR)	0,016	8,9	1,62E-04	1,44E-12	0,00144
195	7	P	11.02.2011	Tank	Direct	647	Cd 111(LR)	0,009	16,1	9,12E-05	8,11E-13	0,00081

196	7	D	11.02.2011	Tank	Direct	648	Cd 111(LR)	0,009	3,7	8,65E-05	7,70E-13	0,00077
197	8	P	11.02.2011	Tank	Direct	649	Cd 111(LR)	0,013	22,2	1,26E-04	1,12E-12	0,00112
198	8	D	11.02.2011	Tank	Direct	650	Cd 111(LR)	0,010	0,6	9,52E-05	8,47E-13	0,00085
199	9	P	11.02.2011	Tank	Direct	651	Cd 111(LR)	0,009	12,4	8,71E-05	7,75E-13	0,00077
200	9	D	11.02.2011	Tank	Direct	652	Cd 111(LR)	0,008	4,0	8,45E-05	7,52E-13	0,00075
201	10	P	11.02.2011	Tank	Direct	653	Cd 111(LR)	0,008	7,1	8,21E-05	7,31E-13	0,00073
202	10	D	11.02.2011	Tank	Direct	654	Cd 111(LR)	0,006	6,3	5,72E-05	5,09E-13	0,00051
203	1	P	13.02.2011	Tank	Direct	655	Cd 111(LR)	0,006	12,7	5,99E-05	5,33E-13	0,00053
204	1	D	13.02.2011	Tank	Direct	656	Cd 111(LR)	0,009	3,8	8,91E-05	7,92E-13	0,00079
205	2	P	13.02.2011	Tank	Direct	657	Cd 111(LR)	0,010	2,0	9,84E-05	8,75E-13	0,00088
206	2	D	13.02.2011	Tank	Direct	658	Cd 111(LR)	0,009	5,5	8,94E-05	7,95E-13	0,00080
207	3	P	13.02.2011	Tank	Direct	659	Cd 111(LR)	0,012	6,6	1,19E-04	1,05E-12	0,00105
208	3	D	13.02.2011	Tank	Direct	660	Cd 111(LR)	0,008	6,7	8,26E-05	7,35E-13	0,00073
209	4	P	13.02.2011	Tank	Direct	661	Cd 111(LR)	0,005	10,2	4,78E-05	4,25E-13	0,00043
210	4	D	13.02.2011	Tank	Direct	662	Cd 111(LR)	0,004	9,1	3,84E-05	3,42E-13	0,00034
211	5	P	13.02.2011	Tank	Direct	663	Cd 111(LR)	0,005	16,6	5,02E-05	4,46E-13	0,00045
212	5	D	13.02.2011	Tank	Direct	664	Cd 111(LR)	0,004	10,4	4,04E-05	3,60E-13	0,00036
213	6	P	14.02.2011	Tank	Direct	665	Cd 111(LR)	0,009	30,0	9,29E-05	8,26E-13	0,00083
214	6	D	14.02.2011	Tank	Direct	666	Cd 111(LR)	0,009	7,9	8,85E-05	7,87E-13	0,00079
215	7	P	14.02.2011	Tank	Direct	667	Cd 111(LR)	0,009	15,8	8,53E-05	7,59E-13	0,00076
216	7	D	14.02.2011	Tank	Direct	668	Cd 111(LR)	0,009	22,1	9,05E-05	8,05E-13	0,00080
217	8	P	14.02.2011	Tank	Direct	669	Cd 111(LR)	0,007	6,1	7,42E-05	6,60E-13	0,00066
218	8	D	14.02.2011	Tank	Direct	670	Cd 111(LR)	0,007	1,6	6,89E-05	6,13E-13	0,00061
219	9	P	14.02.2011	Tank	Direct	671	Cd 111(LR)	0,008	3,7	8,09E-05	7,20E-13	0,00072
220	9	D	14.02.2011	Tank	Direct	672	Cd 111(LR)	0,005	21,2	5,37E-05	4,78E-13	0,00048
221	10	P	14.02.2011	Tank	Direct	673	Cd 111(LR)	0,006	10,2	6,34E-05	5,64E-13	0,00056
222	10	D	14.02.2011	Tank	Direct	674	Cd 111(LR)	0,004	13,1	4,31E-05	3,83E-13	0,00038
	0 m	P		Depth Profile	Direct	675	Cd 111(LR)	-0,001	10,5	-1,31E-05	-1,17E-13	-0,00012
	0 m	D		Depth Profile	Direct	676	Cd 111(LR)	-0,002	19,6	-1,54E-05	-1,37E-13	-0,00014

	4 m	P		Depth Profile	Direct	677	Cd 111(LR)	0,006	16,9	6,32E-05	5,62E-13	0,00056
	4 m	D		Depth Profile	Direct	678	Cd 111(LR)	0,006	11,8	5,97E-05	5,31E-13	0,00053
	10 m	P		Depth Profile	Direct	679	Cd 111(LR)	0,009	14,2	9,20E-05	8,19E-13	0,00082
	10 m	D		Depth Profile	Direct	680	Cd 111(LR)	0,011	14,4	1,11E-04	9,85E-13	0,00098
	30 m	P		Depth Profile	Direct	681	Cd 111(LR)	0,012	2,7	1,22E-04	1,08E-12	0,00108
	30 m	D		Depth Profile	Direct	682	Cd 111(LR)	0,011	11,6	1,06E-04	9,40E-13	0,00094
	50 m	P		Depth Profile	Direct	683	Cd 111(LR)	0,011	7,3	1,11E-04	9,87E-13	0,00099
	50 m	D		Depth Profile	Direct	684	Cd 111(LR)	0,011	12,8	1,12E-04	9,98E-13	0,00100
	70 m	P		Depth Profile	Direct	685	Cd 111(LR)	0,011	7,6	1,07E-04	9,50E-13	0,00095
	70 m	D		Depth Profile	Direct	686	Cd 111(LR)	0,013	19,5	1,30E-04	1,16E-12	0,00116
A		P		River	Direct	687	Cd 111(LR)	-0,003	14,1	-2,55E-05	-2,27E-13	-0,00023
A		D		River	Direct	688	Cd 111(LR)	-0,003	4,1	-2,54E-05	-2,26E-13	-0,00023
B		P		River	Direct	689	Cd 111(LR)	0,002	11,5	1,87E-05	1,66E-13	0,00017
B		D		River	Direct	690	Cd 111(LR)	-0,004	51,2	-4,11E-05	-3,65E-13	-0,00037
C		P		River	Direct	691	Cd 111(LR)	-0,001	1,7	-1,45E-05	-1,29E-13	-0,00013
C		D		River	Direct	692	Cd 111(LR)	-0,003	49,1	-3,22E-05	-2,87E-13	-0,00029

Table C6: Results sheet Chelex samples; Molybdenum

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
1	10 m	P	159	23.01.2011	Depth	Chelex	1	Mo 98(MR)	3,52	2,7	0,111	1,16E-09	1,16
2	10 m	D	166	23.01.2011	Depth	Chelex	2	Mo 98(MR)	2,46	2,4	0,074	7,76E-10	0,78
3	5	P	153	23.01.2011	Tank	Chelex	3	Mo 98(MR)	3,95	1,8	0,129	1,34E-09	1,34
4	5	D	170	24.01.2011	Tank	Chelex	4	Mo 98(MR)	5,05	3,2	0,149	1,55E-09	1,55
5	Brk	P	151	24.01.2011	Depth	Chelex	5	Mo 98(MR)	3,94	5,5	0,131	1,36E-09	1,36

6	Brk	D	160	24.01.2011	Depth	Chelex	6	Mo 98(MR)	4,44	7,3	0,139	1,45E-09	1,45
7	1	P	165	26.01.2011	Tank	Chelex	7	Mo 98(MR)	10,21	0,8	0,309	3,22E-09	3,22
8	1	D	164	26.01.2011	Tank	Chelex	8	Mo 98(MR)	0,69	11,9	0,021	2,19E-10	0,22
9	2	P	167	26.01.2011	Tank	Chelex	9	Mo 98(MR)	7,56	1,0	0,226	2,36E-09	2,36
10	2	D	159	26.01.2011	Tank	Chelex	10	Mo 98(MR)	5,90	5,2	0,185	1,93E-09	1,93
11	3	P	149	26.01.2011	Tank	Chelex	11	Mo 98(MR)	7,27	3,3	0,244	2,54E-09	2,54
12	3	D	176	26.01.2011	Tank	Chelex	12	Mo 98(MR)	0,90	6,7	0,026	2,67E-10	0,27
13	4	P	143	26.01.2011	Tank	Chelex	13	Mo 98(MR)	6,59	4,8	0,230	2,40E-09	2,40
14	4	D	173	26.01.2011	Tank	Chelex	14	Mo 98(MR)	6,83	8,2	0,198	2,06E-09	2,06
15	5	P	143	26.01.2011	Tank	Chelex	15	Mo 98(MR)	5,85	2,4	0,205	2,14E-09	2,14
16	5	D	162	26.01.2011	Tank	Chelex	16	Mo 98(MR)	3,71	3,7	0,115	1,20E-09	1,20
17	6	P	161	27.01.2011	Tank	Chelex	17	Mo 98(MR)	7,30	5,3	0,227	2,37E-09	2,37
18	6	D	175	27.01.2011	Tank	Chelex	18	Mo 98(MR)	10,29	1,4	0,294	3,07E-09	3,07
19	7	P	176	27.01.2011	Tank	Chelex	19	Mo 98(MR)	6,01	3,1	0,171	1,79E-09	1,79
20	7	D	143	27.01.2011	Tank	Chelex	20	Mo 98(MR)	6,18	4,1	0,216	2,25E-09	2,25
21	8	P	159	27.01.2011	Tank	Chelex	21	Mo 98(MR)	7,54	1,5	0,237	2,47E-09	2,47
22	8	D	157	27.01.2011	Tank	Chelex	22	Mo 98(MR)	7,74	6,2	0,246	2,57E-09	2,57
23	9	P	183	27.01.2011	Tank	Chelex	23	Mo 98(MR)	6,02	0,8	0,165	1,72E-09	1,72
24	9	D	158	27.01.2011	Tank	Chelex	24	Mo 98(MR)	8,28	0,6	0,262	2,73E-09	2,73
25	10	P	176	27.01.2011	Tank	Chelex	25	Mo 98(MR)	11,22	0,7	0,319	3,33E-09	3,33
26	10	D	164	27.01.2011	Tank	Chelex	26	Mo 98(MR)	7,44	4,5	0,226	2,36E-09	2,36
27	1	P	184	29.01.2011	Tank	Chelex	27	Mo 98(MR)	11,00	5,8	0,300	3,12E-09	3,12
28	1	D	173	29.01.2011	Tank	Chelex	28	Mo 98(MR)	18,64	1,5	0,539	5,62E-09	5,62
29	2	P	176	29.01.2011	Tank	Chelex	29	Mo 98(MR)	14,53	4,2	0,413	4,31E-09	4,31
30	2	D	116	29.01.2011	Tank	Chelex	30	Mo 98(MR)	15,87	0,7	0,686	7,16E-09	7,16
31	3	P	180	29.01.2011	Tank	Chelex	31	Mo 98(MR)	10,78	4,5	0,299	3,12E-09	3,12
32	3	D	112	29.01.2011	Tank	Chelex	32	Mo 98(MR)	13,03	3,3	0,584	6,09E-09	6,09
33	4	P	159	29.01.2011	Tank	Chelex	33	Mo 98(MR)	9,71	2,7	0,306	3,19E-09	3,19
34	4	D	161	29.01.2011	Tank	Chelex	34	Mo 98(MR)	51,60	2,6	1,607	1,68E-08	16,75
35	5	P	160	29.01.2011	Tank	Chelex	35	Mo 98(MR)	9,46	1,7	0,296	3,09E-09	3,09
36	5	D	161	29.01.2011	Tank	Chelex	36	Mo 98(MR)	13,56	1,8	0,421	4,39E-09	4,39
37	6	P	117	30.01.2011	Tank	Chelex	37	Mo 98(MR)	22,02	1,5	0,941	9,81E-09	9,81
38	6	D	123	30.01.2011	Tank	Chelex	38	Mo 98(MR)	20,53	2,5	0,832	8,68E-09	8,68
39	7	P	125	30.01.2011	Tank	Chelex	39	Mo 98(MR)	19,71	4,4	0,789	8,23E-09	8,23

40	7	D	131	30.01.2011	Tank	Chelex	40	Mo 98(MR)	19,20	8,4	0,731	7,62E-09	7,62
41	8	P	111	30.01.2011	Tank	Chelex	41	Mo 98(MR)	7,81	2,9	0,353	3,68E-09	3,68
42	8	D	124	30.01.2011	Tank	Chelex	42	Mo 98(MR)	12,86	6,8	0,517	5,39E-09	5,39
43	9	P	125	30.01.2011	Tank	Chelex	43	Mo 98(MR)	6,23	9,4	0,249	2,59E-09	2,59
44	9	D	128	30.01.2011	Tank	Chelex	44	Mo 98(MR)	12,08	3,4	0,474	4,94E-09	4,94
45	10	P	122	30.01.2011	Tank	Chelex	45	Mo 98(MR)	2,69	2,3	0,110	1,15E-09	1,15
46	10	D	126	30.01.2011	Tank	Chelex	46	Mo 98(MR)	5,24	3,5	0,208	2,17E-09	2,17
47	1	P	161	04.02.2011	Tank	Chelex	47	Mo 98(MR)	8,94	7,8	0,277	2,89E-09	2,89
48	1	D	120	04.02.2011	Tank	Chelex	48	Mo 98(MR)	12,38	5,7	0,515	5,37E-09	5,37
49	2	P	112	04.02.2011	Tank	Chelex	49	Mo 98(MR)	15,55	1,7	0,692	7,21E-09	7,21
50	2	D	114	04.02.2011	Tank	Chelex	50	Mo 98(MR)	10,56	2,0	0,462	4,82E-09	4,82
51	3	P	116	04.02.2011	Tank	Chelex	51	Mo 98(MR)	0,85	4,5	0,037	3,81E-10	0,38
52	3	D	116	04.02.2011	Tank	Chelex	52	Mo 98(MR)	0,39	9,7	0,017	1,75E-10	0,18
53	4	P	152	04.02.2011	Tank	Chelex	53	Mo 98(MR)	0,59	1,3	0,019	2,03E-10	0,20
53	4	P	152	04.02.2011	Tank	Chelex	53	Mo 98(MR)	0,59	0,8	0,019	2,01E-10	0,20
54	4	D	150	04.02.2011	Tank	Chelex	54	Mo 98(MR)	0,90	1,7	0,030	3,13E-10	0,31
55	5	P	169	04.02.2011	Tank	Chelex	55	Mo 98(MR)	0,58	3,8	0,017	1,77E-10	0,18
56	5	D	140	04.02.2011	Tank	Chelex	56	Mo 98(MR)	0,20	3,5	0,007	7,29E-11	0,07
57	6	P	182	05.02.2011	Tank	Chelex	57	Mo 98(MR)	14,22	2,2	0,390	4,07E-09	4,07
58	6	D	174	05.02.2011	Tank	Chelex	58	Mo 98(MR)	0,06	4,8	0,002	1,75E-11	0,02
59	7	P	155	05.02.2011	Tank	Chelex	59	Mo 98(MR)	3,83	2,6	0,123	1,28E-09	1,28
60	7	D	160	05.02.2011	Tank	Chelex	60	Mo 98(MR)	10,23	1,6	0,320	3,33E-09	3,33
61	8	P	152	05.02.2011	Tank	Chelex	61	Mo 98(MR)	2,50	2,2	0,083	8,62E-10	0,86
62	8	D	155	05.02.2011	Tank	Chelex	62	Mo 98(MR)	2,34	3,4	0,076	7,88E-10	0,79
63	9	P	173	05.02.2011	Tank	Chelex	63	Mo 98(MR)	0,06	4,9	0,002	1,79E-11	0,02
64	9	D	161	05.02.2011	Tank	Chelex	64	Mo 98(MR)	1,61	2,8	0,050	5,23E-10	0,52
65	10	P	144	05.02.2011	Tank	Chelex	65	Mo 98(MR)	0,74	1,4	0,026	2,69E-10	0,27
66	10	D	166	05.02.2011	Tank	Chelex	66	Mo 98(MR)	0,75	0,8	0,023	2,36E-10	0,24
67	1	P	119	13.02.2011	Tank	Chelex	67	Mo 98(MR)	14,47	0,6	0,606	6,32E-09	6,32
68	1	D	112	13.02.2011	Tank	Chelex	68	Mo 98(MR)	11,64	2,2	0,520	5,42E-09	5,42
69	2	P	126	13.02.2011	Tank	Chelex	69	Mo 98(MR)	7,79	1,4	0,308	3,21E-09	3,21
70	2	D	117	13.02.2011	Tank	Chelex	70	Mo 98(MR)	13,73	0,8	0,587	6,12E-09	6,12
71	3	P	117	13.02.2011	Tank	Chelex	71	Mo 98(MR)	8,80	1,7	0,375	3,91E-09	3,91
72	3	D	121	13.02.2011	Tank	Chelex	72	Mo 98(MR)	10,55	1,2	0,435	4,53E-09	4,53

73	4	P	121	13.02.2011	Tank	Chelex	73	Mo 98(MR)	1,33	3,3	0,055	5,73E-10	0,57
74	4	D	121	13.02.2011	Tank	Chelex	74	Mo 98(MR)	4,13	3,1	0,171	1,78E-09	1,78
75	5	P	101	13.02.2011	Tank	Chelex	75	Mo 98(MR)	3,47	3,3	0,171	1,79E-09	1,79
76	5	D	108	13.02.2011	Tank	Chelex	76	Mo 98(MR)	1,93	1,3	0,089	9,30E-10	0,93
77	6	P	120	14.02.2011	Tank	Chelex	77	Mo 98(MR)	0,08	0,7	0,003	3,56E-11	0,04
78	6	D	107	14.02.2011	Tank	Chelex	78	Mo 98(MR)	11,04	3,5	0,518	5,40E-09	5,40
79	7	P	117	14.02.2011	Tank	Chelex	79	Mo 98(MR)	0,22	8,5	0,010	1,00E-10	0,10
80	7	D	95	14.02.2011	Tank	Chelex	80	Mo 98(MR)	2,08	2,0	0,110	1,15E-09	1,15
81	8	P	112	14.02.2011	Tank	Chelex	81	Mo 98(MR)	4,98	0,8	0,223	2,32E-09	2,32
82	8	D	112	14.02.2011	Tank	Chelex	82	Mo 98(MR)	9,83	0,6	0,437	4,56E-09	4,56
83	9	P	102	14.02.2011	Tank	Chelex	83	Mo 98(MR)	2,86	1,4	0,141	1,47E-09	1,47
84	9	D	120	14.02.2011	Tank	Chelex	84	Mo 98(MR)	5,81	1,8	0,242	2,53E-09	2,53
85	10	P	117	14.02.2011	Tank	Chelex	85	Mo 98(MR)	5,51	3,0	0,236	2,46E-09	2,46
86	10	D	116	14.02.2011	Tank	Chelex	86	Mo 98(MR)	3,38	1,2	0,146	1,52E-09	1,52
A	10	P	120		Depth Profile	Chelex	87	Mo 98(MR)	3,86	1,2	0,161	1,68E-09	1,68
B	10	D	120		Depth Profile	Chelex	88	Mo 98(MR)	1,22	7,5	0,051	5,30E-10	0,53
C	0	P	122		Depth Profile	Chelex	89	Mo 98(MR)	-0,02	35,8	-0,001	-7,76E-12	-0,01
D	0	D	115		Depth Profile	Chelex	90	Mo 98(MR)	0,03	13,0	0,001	1,51E-11	0,02
E	4	P	120		Depth Profile	Chelex	91	Mo 98(MR)	1,16	8,1	0,048	5,03E-10	0,50
F	4	D	126		Depth Profile	Chelex	92	Mo 98(MR)	2,85	3,7	0,113	1,18E-09	1,18
G	50	P	103		Depth Profile	Chelex	93	Mo 98(MR)	6,70	2,4	0,325	3,39E-09	3,39
H	50	D	125		Depth Profile	Chelex	94	Mo 98(MR)	5,27	5,4	0,211	2,20E-09	2,20
I	30	P	125		Depth Profile	Chelex	95	Mo 98(MR)	6,37	3,8	0,255	2,66E-09	2,66
J	30	D	120		Depth Profile	Chelex	96	Mo 98(MR)	6,94	2,4	0,289	3,01E-09	3,01
K	70	P	100		Depth Profile	Chelex	97	Mo 98(MR)	0,57	3,9	0,028	2,95E-10	0,29
L	70	D	120		Depth Profile	Chelex	98	Mo 98(MR)	6,44	3,2	0,268	2,80E-09	2,80
M	A	P	28		River	Chelex	99	Mo 98(MR)	0,42	1,6	0,075	7,84E-10	0,78
N	B	P	50		River	Chelex	100	Mo 98(MR)	-0,03	24,2	-0,003	-3,06E-11	-0,03
O	C	P	48		River	Chelex	101	Mo 98(MR)	-0,03	4,3	-0,003	-3,01E-11	-0,03
P	A	D	45		River	Chelex	102	Mo 98(MR)	0,80	5,6	0,089	9,32E-10	0,93
Q	B	D	45		River	Chelex	103	Mo 98(MR)	-0,03	18,0	-0,003	-3,51E-11	-0,04
R	C	D	45		River	Chelex	104	Mo 98(MR)	-0,03	17,6	-0,003	-3,61E-11	-0,04

Table C7: Results sheet DGT samples; molybdenum

										Concentration					
										Uncorrected		Corrected			
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Time (sec)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**M (ng) DGT**	**Mol.L^{-1}**	**nM**
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	132	Mo 98(MR)	0,66	1,8	0,15	4,15	1,53E-09	1,53
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	133	Mo 98(MR)	0,77	4,0	0,17	4,82	1,78E-09	1,78
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	134	Mo 98(MR)	1,12	3,8	0,21	7,02	2,18E-09	2,18
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	135	Mo 98(MR)	0,73	2,8	0,14	4,56	1,41E-09	1,41
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	136	Mo 98(MR)	0,70	6,5	0,10	4,37	1,02E-09	1,02
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	137	Mo 98(MR)	0,72	3,6	0,10	4,48	1,04E-09	1,04
2	5	D	1700	214740	23.01.2011	Tank	DGT	138	Mo 98(MR)	0,61	3,8	0,13	3,80	1,40E-09	1,40
2	5	D	1700	214740	23.01.2011	Tank	DGT	139	Mo 98(MR)	0,71	2,4	0,16	4,47	1,65E-09	1,65
2	5	D	1700	255240	23.01.2011	Tank	DGT	140	Mo 98(MR)	0,83	3,3	0,15	5,16	1,60E-09	1,60
2	5	D	1700	255240	23.01.2011	Tank	DGT	141	Mo 98(MR)	0,95	7,3	0,18	5,94	1,84E-09	1,84
2	5	D	1700	340140	23.01.2011	Tank	DGT	142	Mo 98(MR)	0,70	1,9	0,10	4,37	1,02E-09	1,02
2	5	D	1700	340140	23.01.2011	Tank	DGT	143	Mo 98(MR)	0,68	3,8	0,09	4,24	9,87E-10	0,99
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	144	Mo 98(MR)	0,60	4,9	0,16	3,73	1,67E-09	1,67
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	145	Mo 98(MR)	0,55	4,6	0,15	3,46	1,55E-09	1,55
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	146	Mo 98(MR)	0,61	5,9	0,10	3,81	1,09E-09	1,09
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	147	Mo 98(MR)	0,52	4,2	0,09	3,24	9,22E-10	0,92
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	148	Mo 98(MR)	0,67	3,3	0,11	4,16	1,18E-09	1,18
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	149	Mo 98(MR)	0,61	3,8	0,10	3,80	1,08E-09	1,08
4	5	P	1360	176880	23.01.2011	Tank	DGT	150	Mo 98(MR)	0,45	6,0	0,12	2,82	1,26E-09	1,26
4	5	P	1360	176880	23.01.2011	Tank	DGT	151	Mo 98(MR)	0,72	3,0	0,19	4,48	2,01E-09	2,01
4	5	P	1360	277800	23.01.2011	Tank	DGT	152	Mo 98(MR)	0,56	6,6	0,10	3,51	1,00E-09	1,00
4	5	P	1360	277800	23.01.2011	Tank	DGT	153	Mo 98(MR)	0,67	2,4	0,12	4,21	1,20E-09	1,20
4	5	P	1360	277800	23.01.2011	Tank	DGT	154	Mo 98(MR)	0,60	5,1	0,10	3,72	1,06E-09	1,06
4	5	P	1360	277800	23.01.2011	Tank	DGT	155	Mo 98(MR)	0,51	2,9	0,09	3,20	9,11E-10	0,91
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	156	Mo 98(MR)	0,37	5,6	0,10	2,31	1,06E-09	1,06
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	157	Mo 98(MR)	0,58	3,3	0,16	3,63	1,67E-09	1,67
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	158	Mo 98(MR)	0,51	3,1	0,09	3,16	9,72E-10	0,97
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	159	Mo 98(MR)	0,52	3,8	0,10	3,24	9,97E-10	1,00

5	Brk	P	2060	317520	24.01.2011	Depth	DGT	160	Mo 98(MR)	0,66	3,4	0,10	4,14	1,03E-09	1,03
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	161	Mo 98(MR)	0,74	1,4	0,11	4,64	1,16E-09	1,16
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	162	Mo 98(MR)	0,51	5,2	0,14	3,17	1,46E-09	1,46
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	163	Mo 98(MR)	0,38	4,1	0,10	2,37	1,09E-09	1,09
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	164	Mo 98(MR)	0,93	4,5	0,17	5,81	1,79E-09	1,79
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	165	Mo 98(MR)	0,45	1,9	0,08	2,79	8,59E-10	0,86
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	166	Mo 98(MR)	0,47	1,1	0,07	2,92	7,28E-10	0,73
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	167	Mo 98(MR)	0,51	7,3	0,08	3,16	7,86E-10	0,79
7	1	P	2360	250200	26.01.2011	Tank	DGT	168	Mo 98(MR)	10,89	1,6	2,07	68,04	2,15E-08	21,53
7	1	P	2360	250200	26.01.2011	Tank	DGT	169	Mo 98(MR)	11,30	3,1	2,14	70,61	2,23E-08	22,34
7	1	P	2360	250200	26.01.2011	Tank	DGT	170	Mo 98(MR)	9,76	2,6	1,85	61,01	1,93E-08	19,30
8	2	P	2050	250200	26.01.2011	Tank	DGT	171	Mo 98(MR)	13,34	2,9	2,53	83,38	2,64E-08	26,38
8	2	P	2050	250200	26.01.2011	Tank	DGT	172	Mo 98(MR)	14,31	2,6	2,72	89,47	2,83E-08	28,30
8	2	P	2050	250200	26.01.2011	Tank	DGT	173	Mo 98(MR)	13,99	0,6	2,65	87,43	2,77E-08	27,66
9	3	P	1345	250200	26.01.2011	Tank	DGT	174	Mo 98(MR)	1,12	2,3	0,21	6,98	2,21E-09	2,21
9	3	P	1345	250200	26.01.2011	Tank	DGT	175	Mo 98(MR)	0,99	2,6	0,19	6,16	1,95E-09	1,95
9	3	P	1345	250200	26.01.2011	Tank	DGT	176	Mo 98(MR)	0,78	1,9	0,15	4,86	1,54E-09	1,54
10	4	P	1460	250200	26.01.2011	Tank	DGT	177	Mo 98(MR)	5,33	2,3	1,01	33,32	1,05E-08	10,54
10	4	P	1460	250200	26.01.2011	Tank	DGT	178	Mo 98(MR)	5,00	1,8	0,95	31,25	9,89E-09	9,89
10	4	P	1460	250200	26.01.2011	Tank	DGT	179	Mo 98(MR)	5,32	1,1	1,01	33,24	1,05E-08	10,52
11	5	P	1470	250200	26.01.2011	Tank	DGT	180	Mo 98(MR)	27,27	1,0	5,17	170,46	5,39E-08	53,93
11	5	P	1470	250200	26.01.2011	Tank	DGT	181	Mo 98(MR)	31,00	0,6	5,88	193,73	6,13E-08	61,29
11	5	P	1470	250200	26.01.2011	Tank	DGT	182	Mo 98(MR)	31,63	1,0	6,00	197,66	6,25E-08	62,54
12	6	P	2000	252000	27.01.2011	Tank	DGT	183	Mo 98(MR)	0,88	1,9	0,17	5,52	1,73E-09	1,73
12	6	P	2000	252000	27.01.2011	Tank	DGT	184	Mo 98(MR)	0,72	4,3	0,14	4,50	1,41E-09	1,41
12	6	P	2000	252000	27.01.2011	Tank	DGT	185	Mo 98(MR)	0,73	3,3	0,14	4,54	1,43E-09	1,43
13	7	P	2000	252000	27.01.2011	Tank	DGT	186	Mo 98(MR)	0,70	4,1	0,13	4,38	1,38E-09	1,38
13	7	P	2000	252000	27.01.2011	Tank	DGT	187	Mo 98(MR)	0,79	7,2	0,15	4,91	1,54E-09	1,54
13	7	P	2000	252000	27.01.2011	Tank	DGT	188	Mo 98(MR)	0,69	3,9	0,13	4,28	1,35E-09	1,35
14	8	P	1500	252000	27.01.2011	Tank	DGT	189	Mo 98(MR)	0,77	4,3	0,14	4,79	1,50E-09	1,50
14	8	P	1500	252000	27.01.2011	Tank	DGT	190	Mo 98(MR)	0,12	4,7	0,02	0,72	2,26E-10	0,23
14	8	P	1500	252000	27.01.2011	Tank	DGT	191	Mo 98(MR)	1,74	1,2	0,33	10,88	3,42E-09	3,42
15	9	P	1500	252000	27.01.2011	Tank	DGT	192	Mo 98(MR)	0,74	2,5	0,14	4,62	1,45E-09	1,45
15	9	P	1500	252000	27.01.2011	Tank	DGT	193	Mo 98(MR)	0,81	1,5	0,15	5,09	1,60E-09	1,60

15	9	P	1500	252000	27.01.2011	Tank	DGT	194	Mo 98(MR)	0,55	5,2	0,10	3,46	1,09E-09	1,09
16	10	P	2000	283800	27.01.2011	Tank	DGT	195	Mo 98(MR)	0,94	3,4	0,16	5,86	1,64E-09	1,64
16	10	P	2000	283800	27.01.2011	Tank	DGT	196	Mo 98(MR)	0,69	3,7	0,11	4,29	1,20E-09	1,20
16	10	P	2000	283800	27.01.2011	Tank	DGT	197	Mo 98(MR)	0,85	0,9	0,14	5,29	1,48E-09	1,48
17	4	P	2000	405120	29.01.2011	Tank	DGT	198	Mo 98(MR)	0,42	6,5	0,05	2,65	5,17E-10	0,52
17	4	P	2000	405120	29.01.2011	Tank	DGT	199	Mo 98(MR)	0,60	2,7	0,07	3,72	7,28E-10	0,73
18	5	P	2000	405120	29.01.2011	Tank	DGT	200	Mo 98(MR)	0,28	5,9	0,03	1,75	3,42E-10	0,34
18	5	P	2000	405120	29.01.2011	Tank	DGT	201	Mo 98(MR)	0,55	2,9	0,06	3,41	6,66E-10	0,67
19	9	P	1500	313140	30.01.2011	Tank	DGT	202	Mo 98(MR)	0,51	3,9	0,08	3,18	8,03E-10	0,80
19	9	P	1500	313140	30.01.2011	Tank	DGT	203	Mo 98(MR)	0,33	0,7	0,05	2,08	5,25E-10	0,52
20	10	P	1500	312900	30.01.2011	Tank	DGT	204	Mo 98(MR)	0,52	11,7	0,08	3,24	8,19E-10	0,82
20	10	P	1500	312900	30.01.2011	Tank	DGT	205	Mo 98(MR)	0,17	10,7	0,03	1,04	2,64E-10	0,26
21	1	P	2000	253200	04.02.2011	Tank	DGT	206	Mo 98(MR)	0,69	4,5	0,13	4,33	1,35E-09	1,35
21	1	P	2000	253200	04.02.2011	Tank	DGT	207	Mo 98(MR)	1,05	6,5	0,20	6,54	2,04E-09	2,04
21	1	P	2000	253200	04.02.2011	Tank	DGT	208	Mo 98(MR)	0,73	2,2	0,14	4,54	1,42E-09	1,42
22	2	P	2000	252600	04.02.2011	Tank	DGT	209	Mo 98(MR)	0,98	2,5	0,18	6,10	1,91E-09	1,91
22	2	P	2000	252600	04.02.2011	Tank	DGT	210	Mo 98(MR)	0,84	2,7	0,16	5,26	1,65E-09	1,65
22	2	P	2000	252600	04.02.2011	Tank	DGT	211	Mo 98(MR)	0,81	3,7	0,15	5,04	1,58E-09	1,58
23	3	P	2000	252420	04.02.2011	Tank	DGT	212	Mo 98(MR)	0,67	1,6	0,13	4,16	1,30E-09	1,30
23	3	P	2000	252420	04.02.2011	Tank	DGT	213	Mo 98(MR)	0,66	1,7	0,13	4,16	1,30E-09	1,30
23	3	P	2000	252420	04.02.2011	Tank	DGT	214	Mo 98(MR)	0,48	12,0	0,09	3,02	9,46E-10	0,95
24	4	P	1500	252180	04.02.2011	Tank	DGT	215	Mo 98(MR)	0,52	2,7	0,10	3,27	1,03E-09	1,03
24	4	P	1500	252180	04.02.2011	Tank	DGT	216	Mo 98(MR)	0,54	8,4	0,10	3,38	1,06E-09	1,06
24	4	P	1500	252180	04.02.2011	Tank	DGT	217	Mo 98(MR)	0,36	3,1	0,07	2,22	6,98E-10	0,70
25	5	P	1500	252000	04.02.2011	Tank	DGT	218	Mo 98(MR)	0,45	5,7	0,09	2,83	8,90E-10	0,89
25	5	P	1500	252000	04.02.2011	Tank	DGT	219	Mo 98(MR)	0,91	3,9	0,17	5,71	1,79E-09	1,79
25	5	P	1500	252000	04.02.2011	Tank	DGT	220	Mo 98(MR)	0,53	0,9	0,10	3,33	1,05E-09	1,05
26	6	P	1500	426300	05.02.2011	Tank	DGT	221	Mo 98(MR)	0,72	7,3	0,08	4,49	8,33E-10	0,83
26	6	P	1500	426300	05.02.2011	Tank	DGT	222	Mo 98(MR)	0,66	4,0	0,07	4,13	7,67E-10	0,77
26	6	P	1500	426300	05.02.2011	Tank	DGT	223	Mo 98(MR)	0,63	3,0	0,07	3,93	7,29E-10	0,73
27	7	P	1500	426300	05.02.2011	Tank	DGT	224	Mo 98(MR)	0,64	2,2	0,07	4,00	7,42E-10	0,74
27	7	P	1500	426300	05.02.2011	Tank	DGT	225	Mo 98(MR)	0,66	9,3	0,07	4,11	7,63E-10	0,76
27	7	P	1500	426300	05.02.2011	Tank	DGT	226	Mo 98(MR)	0,69	5,5	0,08	4,29	7,96E-10	0,80
28	8	P	1500	426300	05.02.2011	Tank	DGT	227	Mo 98(MR)	0,69	2,7	0,08	4,34	8,06E-10	0,81

28	8	P	1500	426300	05.02.2011	Tank	DGT	228	Mo 98(MR)	0,68	5,4	0,08	4,23	7,85E-10	0,79
28	8	P	1500	426300	05.02.2011	Tank	DGT	229	Mo 98(MR)	0,53	10,7	0,06	3,30	6,13E-10	0,61
29	9	P	1500	426300	05.02.2011	Tank	DGT	230	Mo 98(MR)	0,50	4,0	0,06	3,14	5,83E-10	0,58
29	9	P	1500	426300	05.02.2011	Tank	DGT	231	Mo 98(MR)	0,69	6,2	0,08	4,32	8,02E-10	0,80
29	9	P	1500	426300	05.02.2011	Tank	DGT	232	Mo 98(MR)	0,44	10,3	0,05	2,72	5,06E-10	0,51
30	10	P	1500	426300	05.02.2011	Tank	DGT	233	Mo 98(MR)	0,46	1,5	0,05	2,90	5,39E-10	0,54
30	10	P	1500	426300	05.02.2011	Tank	DGT	234	Mo 98(MR)	0,41	4,2	0,05	2,59	4,80E-10	0,48
30	10	P	1500	426300	05.02.2011	Tank	DGT	235	Mo 98(MR)	0,41	2,6	0,05	2,54	4,71E-10	0,47
31	1	P	1500	259860	13.02.2011	Tank	DGT	236	Mo 98(MR)	1,17	3,1	0,21	7,34	2,24E-09	2,24
31	1	P	1500	259860	13.02.2011	Tank	DGT	237	Mo 98(MR)	1,15	2,1	0,21	7,17	2,19E-09	2,19
31	1	P	1500	259860	13.02.2011	Tank	DGT	238	Mo 98(MR)	1,03	1,9	0,19	6,47	1,97E-09	1,97
32	2	P	1500	259860	13.02.2011	Tank	DGT	239	Mo 98(MR)	0,94	2,4	0,17	5,87	1,79E-09	1,79
32	2	P	1500	259860	13.02.2011	Tank	DGT	240	Mo 98(MR)	0,67	1,9	0,12	4,19	1,28E-09	1,28
32	2	P	1500	259860	13.02.2011	Tank	DGT	241	Mo 98(MR)	0,81	7,8	0,15	5,07	1,54E-09	1,54
33	3	P	2000	259860	13.02.2011	Tank	DGT	242	Mo 98(MR)	0,43	4,9	0,08	2,72	8,28E-10	0,83
33	3	P	2000	259860	13.02.2011	Tank	DGT	243	Mo 98(MR)	0,57	4,0	0,10	3,56	1,08E-09	1,08
33	3	P	2000	259860	13.02.2011	Tank	DGT	244	Mo 98(MR)	0,56	3,2	0,10	3,52	1,07E-09	1,07
34	4	P	2000	259860	13.02.2011	Tank	DGT	245	Mo 98(MR)	0,64	2,2	0,12	4,02	1,22E-09	1,22
34	4	P	2000	259860	13.02.2011	Tank	DGT	246	Mo 98(MR)	0,39	7,1	0,07	2,44	7,44E-10	0,74
34	4	P	2000	259860	13.02.2011	Tank	DGT	247	Mo 98(MR)	0,43	5,1	0,08	2,71	8,26E-10	0,83
35	5	P	2000	259860	13.02.2011	Tank	DGT	248	Mo 98(MR)	0,44	3,3	0,08	2,74	8,35E-10	0,84
35	5	P	2000	259860	13.02.2011	Tank	DGT	249	Mo 98(MR)	0,48	2,8	0,09	2,98	9,08E-10	0,91
35	5	P	2000	259860	13.02.2011	Tank	DGT	250	Mo 98(MR)	0,51	4,1	0,09	3,20	9,76E-10	0,98
36	6	P	1500	256560	14.02.2011	Tank	DGT	251	Mo 98(MR)	0,77	6,2	0,14	4,83	1,49E-09	1,49
36	6	P	1500	256560	14.02.2011	Tank	DGT	252	Mo 98(MR)	1,89	4,2	0,35	11,84	3,65E-09	3,65
36	6	P	1500	256560	14.02.2011	Tank	DGT	253	Mo 98(MR)	0,76	3,5	0,14	4,78	1,47E-09	1,47
37	7	P	1500	256560	14.02.2011	Tank	DGT	254	Mo 98(MR)	0,83	0,5	0,15	5,22	1,61E-09	1,61
37	7	P	1500	256560	14.02.2011	Tank	DGT	255	Mo 98(MR)	1,18	2,4	0,22	7,36	2,27E-09	2,27
37	7	P	1500	256560	14.02.2011	Tank	DGT	256	Mo 98(MR)	1,12	3,2	0,21	7,03	2,17E-09	2,17
38	8	P	1500	256560	14.02.2011	Tank	DGT	257	Mo 98(MR)	1,16	1,3	0,21	7,24	2,23E-09	2,23
38	8	P	1500	256560	14.02.2011	Tank	DGT	258	Mo 98(MR)	1,00	2,6	0,18	6,23	1,92E-09	1,92
38	8	P	1500	256560	14.02.2011	Tank	DGT	259	Mo 98(MR)	1,14	4,6	0,21	7,14	2,20E-09	2,20
39	9	P	2000	255060	14.02.2011	Tank	DGT	260	Mo 98(MR)	0,56	6,3	0,10	3,47	1,08E-09	1,08
39	9	P	2000	255060	14.02.2011	Tank	DGT	261	Mo 98(MR)	0,63	2,7	0,12	3,97	1,23E-09	1,23

39	9	P	2000	255060	14.02.2011	Tank	DGT	262	Mo 98(MR)	0,48	8,0	0,09	2,97	9,21E-10	0,92
40	10	P	2000	255060	14.02.2011	Tank	DGT	263	Mo 98(MR)	0,89	3,9	0,17	5,58	1,73E-09	1,73
40	10	P	2000	255060	14.02.2011	Tank	DGT	264	Mo 98(MR)	1,27	4,3	0,24	7,96	2,47E-09	2,47
40	10	P	2000	255060	14.02.2011	Tank	DGT	265	Mo 98(MR)	1,91	5,5	0,35	11,92	3,70E-09	3,70
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	266	Mo 98(MR)	0,41	5,6	0,06	2,57	6,09E-10	0,61
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	267	Mo 98(MR)	0,58	7,8	0,08	3,65	8,64E-10	0,86
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	268	Mo 98(MR)	0,71	4,0	0,10	4,43	1,05E-09	1,05
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	269	Mo 98(MR)	0,54	3,5	0,08	3,35	7,92E-10	0,79
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	270	Mo 98(MR)	0,72	4,8	0,10	4,50	1,06E-09	1,06
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	271	Mo 98(MR)	0,66	3,8	0,09	4,13	9,77E-10	0,98
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	272	Mo 98(MR)	0,77	8,4	0,11	4,80	1,12E-09	1,12
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	273	Mo 98(MR)	0,56	5,9	0,08	3,49	8,11E-10	0,81
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	274	Mo 98(MR)	0,63	5,5	0,09	3,92	9,13E-10	0,91
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	275	Mo 98(MR)	0,51	4,2	0,07	3,17	7,36E-10	0,74
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	276	Mo 98(MR)	0,68	5,1	0,10	4,27	9,93E-10	0,99
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	277	Mo 98(MR)	0,53	3,5	0,07	3,30	7,69E-10	0,77
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	278	Mo 98(MR)	0,66	8,7	0,09	4,10	9,54E-10	0,95
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	279	Mo 98(MR)	0,62	2,2	0,09	3,90	9,07E-10	0,91
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	280	Mo 98(MR)	0,59	5,1	0,08	3,67	8,55E-10	0,85
A			920	329400	09.02.2011	River	DGT	281	Mo 98(MR)	0,55	7,0	0,08	3,43	8,24E-10	0,82
A			920	329400	09.02.2011	River	DGT	282	Mo 98(MR)	0,64	3,5	0,09	3,98	9,56E-10	0,96
A			920	329400	09.02.2011	River	DGT	283	Mo 98(MR)	0,59	4,3	0,08	3,68	8,84E-10	0,88
B			750	325800	09.02.2011	River	DGT	284	Mo 98(MR)	0,07	6,6	0,01	0,44	1,07E-10	0,11
B			750	325800	09.02.2011	River	DGT	285	Mo 98(MR)	0,08	10,7	0,01	0,49	1,20E-10	0,12
B			750	325800	09.02.2011	River	DGT	286	Mo 98(MR)	0,08	2,7	0,01	0,47	1,14E-10	0,11

Table C8: Results sheet total filtration samples; molybdenum

									Concentration				
									Uncorrected		Corrected		
Smpl	Tank/Depth	Fract	Vol (mL)	Date	Type of sample	Method	Project-Inr	Element	µg.L^{-1}	RSD %	µg.L^{-1}	Mol.L^{-1}	nM
4	1	0,2	800	26.01.2011	Filtration	UC-Digest	317	Mo 98(MR)	0,10	5,9	0,0077	8,01E-11	0,080
5	2	0,2	800	26.01.2011	Filtration	UC-Digest	318	Mo 98(MR)	0,09	10,4	0,0066	6,91E-11	0,069
6	3	0,2	600	26.01.2011	Filtration	UC-Digest	319	Mo 98(MR)	0,13	16,7	0,0133	1,39E-10	0,139
7	4	0,2	600	26.01.2011	Filtration	UC-Digest	320	Mo 98(MR)	0,12	11,0	0,0121	1,27E-10	0,127
8	5	0,2	600	26.01.2011	Filtration	UC-Digest	321	Mo 98(MR)	0,13	28,5	0,0133	1,39E-10	0,139
9	6	0,2	600	27.01.2011	Filtration	UC-Digest	322	Mo 98(MR)	0,12	9,6	0,0117	1,22E-10	0,122
10	7	0,2	600	27.01.2011	Filtration	UC-Digest	323	Mo 98(MR)	0,19	8,2	0,0187	1,95E-10	0,195
11	8	0,2	600	27.01.2011	Filtration	UC-Digest	324	Mo 98(MR)	0,08	25,0	0,0078	8,15E-11	0,082
12	9	0,2	600	27.01.2011	Filtration	UC-Digest	325	Mo 98(MR)	0,12	7,7	0,0126	1,31E-10	0,131
13	10	0,2	600	27.01.2011	Filtration	UC-Digest	326	Mo 98(MR)	0,12	12,1	0,0123	1,28E-10	0,128
63	1	0,2	600	01.02.2011	Filtration	UC-Digest	376	Mo 98(MR)	-	-	-	-	-
64	2	0,2	600	01.02.2011	Filtration	UC-Digest	377	Mo 98(MR)	0,19	2,9	0,0197	2,06E-10	0,206
65	3	0,2	600	01.02.2011	Filtration	UC-Digest	378	Mo 98(MR)	0,19	8,0	0,0188	1,96E-10	0,196
66	4	0,2	600	01.02.2011	Filtration	UC-Digest	379	Mo 98(MR)	0,19	4,5	0,0193	2,01E-10	0,201
67	5	0,2	400	01.02.2011	Filtration	UC-Digest	517	Mo 98(MR)	0,12	6,2	0,0184	1,91E-10	0,191
68	6	0,2	600	02.02.2011	Filtration	UC-Digest	381	Mo 98(MR)	0,07	8,0	0,0070	7,25E-11	0,072
69	7	0,2	600	02.02.2011	Filtration	UC-Digest	382	Mo 98(MR)	0,08	9,9	0,0085	8,84E-11	0,088
70	8	0,2	600	02.02.2011	Filtration	UC-Digest	383	Mo 98(MR)	0,10	13,4	0,0098	1,02E-10	0,102
71	9	0,2	400	02.02.2011	Filtration	UC-Digest	384	Mo 98(MR)	0,07	4,9	0,0102	1,06E-10	0,106
72	10	0,2	400	02.02.2011	Filtration	UC-Digest	385	Mo 98(MR)	0,05	2,7	0,0078	8,10E-11	0,081
123	1	0,2	500	07.02.2011	Filtration	UC-Digest	436	Mo 98(MR)	0,16	9,9	0,0187	1,95E-10	0,195
124	2	0,2	500	07.02.2011	Filtration	UC-Digest	437	Mo 98(MR)	0,36	6,4	0,0435	4,53E-10	0,453
125	3	0,2	200	07.02.2011	Filtration	UC-Digest	438	Mo 98(MR)	0,18	7,2	0,0536	5,59E-10	0,559
126	4	0,2	200	07.02.2011	Filtration	UC-Digest	439	Mo 98(MR)	0,09	5,5	0,0266	2,78E-10	0,278
127	5	0,2	200	07.02.2011	Filtration	UC-Digest	440	Mo 98(MR)	0,06	5,8	0,0174	1,81E-10	0,181
128	6	0,2	500	08.02.2011	Filtration	UC-Digest	441	Mo 98(MR)	0,12	5,5	0,0149	1,55E-10	0,155
129	7	0,2	500	08.02.2011	Filtration	UC-Digest	442	Mo 98(MR)	0,11	14,0	0,0131	1,37E-10	0,137
130	8	0,2	300	08.02.2011	Filtration	UC-Digest	443	Mo 98(MR)	0,14	6,4	0,0286	2,98E-10	0,298

131	9	0,2	200	08.02.2011	Filtration	UC-Digest	444	Mo 98(MR)	0,04	7,8	0,0135	1,40E-10	0,140
132	10	0,2	200	08.02.2011	Filtration	UC-Digest	445	Mo 98(MR)	0,02	17,0	0,0052	5,44E-11	0,054
133	1	0,2	500	10.02.2011	Filtration	UC-Digest	446	Mo 98(MR)	0,11	10,5	0,0136	1,41E-10	0,141
134	2	0,2	500	10.02.2011	Filtration	UC-Digest	447	Mo 98(MR)	0,23	0,7	0,0273	2,84E-10	0,284
135	3	0,2	200	10.02.2011	Filtration	UC-Digest	448	Mo 98(MR)	0,19	3,2	0,0557	5,81E-10	0,581
136	4	0,2	200	10.02.2011	Filtration	UC-Digest	449	Mo 98(MR)	0,12	4,2	0,0364	3,80E-10	0,380
137	5	0,2	200	10.02.2011	Filtration	UC-Digest	450	Mo 98(MR)	0,03	12,0	0,0098	1,02E-10	0,102
138	6	0,2	500	11.02.2011	Filtration	UC-Digest	451	Mo 98(MR)	0,09	6,5	0,0109	1,14E-10	0,114
139	7	0,2	500	11.02.2011	Filtration	UC-Digest	452	Mo 98(MR)	0,15	7,4	0,0179	1,87E-10	0,187
140	8	0,2	200	11.02.2011	Filtration	UC-Digest	453	Mo 98(MR)	0,10	7,1	0,0288	3,00E-10	0,300
141	9	0,2	200	11.02.2011	Filtration	UC-Digest	454	Mo 98(MR)	0,10	1,5	0,0299	3,12E-10	0,312
142	10	0,2	200	11.02.2011	Filtration	UC-Digest	455	Mo 98(MR)	0,03	16,1	0,0083	8,64E-11	0,086

Table C9: Results sheet Size fractionation; molybdenum

										Concentration				
										Uncorrected		Corrected		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Time (sec)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
13	1	140	-	-	29.01.2011	Filtration	UC-Digest	326	Mo 98(MR)	-	-	-	-	-
14	1	20	1960	60,00	29.01.2011	Filtration	UC-Digest	327	Mo 98(MR)	0,124	14,9	0,0038	3,95E-11	0,040
15	1	10	600	60,00	29.01.2011	Filtration	UC-Digest	328	Mo 98(MR)	0,017	11,4	0,0017	1,77E-11	0,018
16	1	2	600	60,00	29.01.2011	Filtration	UC-Digest	329	Mo 98(MR)	0,018	44,6	0,0018	1,87E-11	0,019
17	1	0,2	450	60,00	29.01.2011	Filtration	UC-Digest	330	Mo 98(MR)	0,055	7,2	0,0073	7,62E-11	0,076
18	2	140	2100	60,00	29.01.2011	Filtration	UC-Digest	331	Mo 98(MR)	0,092	7,0	0,0026	2,73E-11	0,027
19	2	20	2100	60,00	29.01.2011	Filtration	UC-Digest	332	Mo 98(MR)	0,070	19,1	0,0020	2,09E-11	0,021
20	2	10	600	60,00	29.01.2011	Filtration	UC-Digest	333	Mo 98(MR)	0,008	16,4	0,0008	8,18E-12	0,008
21	2	2	550	60,00	29.01.2011	Filtration	UC-Digest	334	Mo 98(MR)	0,009	52,0	0,0009	9,76E-12	0,010
22	2	0,2	500	60,00	29.01.2011	Filtration	UC-Digest	335	Mo 98(MR)	0,033	24,5	0,0040	4,18E-11	0,042
23	3	140	2000	60,00	29.01.2011	Filtration	UC-Digest	336	Mo 98(MR)	0,069	22,4	0,0021	2,15E-11	0,021
24	3	20	-	60,00	29.01.2011	Filtration	UC-Digest	337	Mo 98(MR)	-	-	-	-	-

25	3	10	600	60,00	29.01.2011	Filtration	UC-Digest	338	Mo 98(MR)	0,017	0,0	0,0017	1,78E-11	0,018
26	3	2	600	60,00	29.01.2011	Filtration	UC-Digest	339	Mo 98(MR)	-	-	-	-	-
27	3	0,2	450	60,00	29.01.2011	Filtration	UC-Digest	340	Mo 98(MR)	0,026	29,7	0,0035	3,62E-11	0,036
28	4	140	2000	60,00	29.01.2011	Filtration	UC-Digest	341	Mo 98(MR)	0,230	8,2	0,0069	7,20E-11	0,072
29	4	20	2000	60,00	29.01.2011	Filtration	UC-Digest	342	Mo 98(MR)	0,066	20,8	0,0020	2,05E-11	0,021
30	4	10	600	60,00	29.01.2011	Filtration	UC-Digest	343	Mo 98(MR)	0,015	8,7	0,0015	1,52E-11	0,015
31	4	2	600	60,00	29.01.2011	Filtration	UC-Digest	344	Mo 98(MR)	0,012	65,0	0,0012	1,20E-11	0,012
32	4	0,2	450	60,00	29.01.2011	Filtration	UC-Digest	345	Mo 98(MR)	0,024	40,8	0,0032	3,34E-11	0,033
33	5	140	2000	60,00	29.01.2011	Filtration	UC-Digest	346	Mo 98(MR)	0,274	4,2	0,0082	8,55E-11	0,086
34	5	20	2000	60,00	29.01.2011	Filtration	UC-Digest	347	Mo 98(MR)	0,086	6,5	0,0026	2,69E-11	0,027
35	5	10	600	60,00	29.01.2011	Filtration	UC-Digest	348	Mo 98(MR)	0,013	4,7	0,0013	1,32E-11	0,013
36	5	2	600	60,00	29.01.2011	Filtration	UC-Digest	349	Mo 98(MR)	0,021	5,5	0,0021	2,23E-11	0,022
37	5	0,2	450	60,00	29.01.2011	Filtration	UC-Digest	350	Mo 98(MR)	0,043	22,7	0,0057	5,91E-11	0,059
38	6	140	2000	60,00	30.01.2011	Filtration	UC-Digest	351	Mo 98(MR)	0,126	15,6	0,0038	3,93E-11	0,039
39	6	20	2000	60,00	30.01.2011	Filtration	UC-Digest	352	Mo 98(MR)	0,092	8,2	0,0028	2,89E-11	0,029
40	6	10	550	60,00	30.01.2011	Filtration	UC-Digest	353	Mo 98(MR)	0,024	11,5	0,0027	2,77E-11	0,028
41	6	2	550	60,00	30.01.2011	Filtration	UC-Digest	354	Mo 98(MR)	0,010	21,5	0,0011	1,12E-11	0,011
42	6	0,2	450	60,00	30.01.2011	Filtration	UC-Digest	355	Mo 98(MR)	0,032	12,0	0,0043	4,45E-11	0,044
43	7	140	2000	60,00	30.01.2011	Filtration	UC-Digest	356	Mo 98(MR)	0,192	10,3	0,0058	6,02E-11	0,060
44	7	20	2000	60,00	30.01.2011	Filtration	UC-Digest	357	Mo 98(MR)	0,082	24,0	0,0025	2,58E-11	0,026
45	7	10	350	60,00	30.01.2011	Filtration	UC-Digest	358	Mo 98(MR)	0,019	16,7	0,0033	3,45E-11	0,034
46	7	2	350	60,00	30.01.2011	Filtration	UC-Digest	359	Mo 98(MR)	0,007	34,3	0,0012	1,28E-11	0,013
47	7	0,2	350	60,00	30.01.2011	Filtration	UC-Digest	360	Mo 98(MR)	0,031	7,1	0,0054	5,60E-11	0,056
48	8	140	2000	60,00	30.01.2011	Filtration	UC-Digest	361	Mo 98(MR)	0,167	3,9	0,0050	5,24E-11	0,052
49	8	20	2000	60,00	30.01.2011	Filtration	UC-Digest	362	Mo 98(MR)	0,108	5,5	0,0032	3,38E-11	0,034
50	8	10	600	60,62	30.01.2011	Filtration	UC-Digest	363	Mo 98(MR)	0,017	6,6	0,0017	1,82E-11	0,018
51	8	2	400	60,00	30.01.2011	Filtration	UC-Digest	364	Mo 98(MR)	0,019	23,9	0,0028	2,96E-11	0,030
52	8	0,2	400	60,00	30.01.2011	Filtration	UC-Digest	516	Mo 98(MR)	0,050	5,3	0,0075	7,86E-11	0,079
53	9	140	2000	60,00	30.01.2011	Filtration	UC-Digest	366	Mo 98(MR)	0,255	3,5	0,0077	7,99E-11	0,080
54	9	20	2000	60,00	30.01.2011	Filtration	UC-Digest	367	Mo 98(MR)	0,104	20,1	0,0031	3,24E-11	0,032
55	9	10	600	60,00	30.01.2011	Filtration	UC-Digest	368	Mo 98(MR)	0,011	4,6	0,0011	1,19E-11	0,012
56	9	2	400	60,00	30.01.2011	Filtration	UC-Digest	369	Mo 98(MR)	0,020	13,3	0,0030	3,13E-11	0,031
57	9	0,2	400	60,00	30.01.2011	Filtration	UC-Digest	370	Mo 98(MR)	0,046	8,1	0,0070	7,26E-11	0,073
58	10	140	2000	60,00	30.01.2011	Filtration	UC-Digest	371	Mo 98(MR)	0,099	6,4	0,0030	3,09E-11	0,031

59	10	20	2000	60,00	30.01.2011	Filtration	UC-Digest	372	Mo 98(MR)	0,066	10,1	0,0020	2,05E-11	0,021
60	10	10	600	60,91	30.01.2011	Filtration	UC-Digest	373	Mo 98(MR)	0,020	34,0	0,0020	2,08E-11	0,021
61	10	2	375	60,00	30.01.2011	Filtration	UC-Digest	374	Mo 98(MR)	0,016	23,1	0,0025	2,60E-11	0,026
62	10	0,2	375	60,00	30.01.2011	Filtration	UC-Digest	375	Mo 98(MR)	0,030	16,7	0,0048	5,05E-11	0,050
73	1	140	2000	60,00	04.02.2011	Filtration	UC-Digest	386	Mo 98(MR)	0,241	7,4	0,0072	7,55E-11	0,075
74	1	20	2000	60,00	04.02.2011	Filtration	UC-Digest	387	Mo 98(MR)	0,134	2,2	0,0040	4,18E-11	0,042
75	1	10	600	60,00	04.02.2011	Filtration	UC-Digest	388	Mo 98(MR)	0,006	26,0	0,0006	6,26E-12	0,006
76	1	2	600	60,00	04.02.2011	Filtration	UC-Digest	389	Mo 98(MR)	0,031	2,3	0,0031	3,18E-11	0,032
77	1	0,2	600	60,00	04.02.2011	Filtration	UC-Digest	390	Mo 98(MR)	0,021	20,1	0,0021	2,23E-11	0,022
78	2	140	2000	60,00	04.02.2011	Filtration	UC-Digest	391	Mo 98(MR)	0,314	3,5	0,0094	9,82E-11	0,098
79	2	20	2000	60,00	04.02.2011	Filtration	UC-Digest	392	Mo 98(MR)	0,680	0,4	0,0204	2,13E-10	0,213
80	2	10	600	60,00	04.02.2011	Filtration	UC-Digest	393	Mo 98(MR)	0,025	13,9	0,0025	2,64E-11	0,026
81	2	2	550	60,00	04.02.2011	Filtration	UC-Digest	394	Mo 98(MR)	0,014	40,1	0,0015	1,59E-11	0,016
82	2	0,2	500	60,00	04.02.2011	Filtration	UC-Digest	395	Mo 98(MR)	0,026	24,6	0,0032	3,30E-11	0,033
83	3	140	2000	60,00	04.02.2011	Filtration	UC-Digest	396	Mo 98(MR)	0,502	4,8	0,0151	1,57E-10	0,157
84	3	20	2000	60,00	04.02.2011	Filtration	UC-Digest	397	Mo 98(MR)	0,924	3,2	0,0277	2,89E-10	0,289
85	3	10	2000	60,00	04.02.2011	Filtration	UC-Digest	398	Mo 98(MR)	0,018	27,0	0,0006	5,76E-12	0,006
86	3	2	300	60,00	04.02.2011	Filtration	UC-Digest	399	Mo 98(MR)	0,031	9,4	0,0063	6,53E-11	0,065
87	3	0,2	300	60,00	04.02.2011	Filtration	UC-Digest	400	Mo 98(MR)	0,014	24,2	0,0028	2,88E-11	0,029
88	4	140	2000	60,00	04.02.2011	Filtration	UC-Digest	401	Mo 98(MR)	0,433	1,6	0,0130	1,35E-10	0,135
89	4	20	1000	60,00	04.02.2011	Filtration	UC-Digest	402	Mo 98(MR)	0,120	3,4	0,0072	7,50E-11	0,075
90	4	10	350	60,00	04.02.2011	Filtration	UC-Digest	403	Mo 98(MR)	0,035	11,4	0,0060	6,29E-11	0,063
91	4	2	300	60,00	04.02.2011	Filtration	UC-Digest	404	Mo 98(MR)	0,010	33,9	0,0020	2,07E-11	0,021
92	4	0,2	300	60,00	04.02.2011	Filtration	UC-Digest	405	Mo 98(MR)	0,018	12,4	0,0035	3,70E-11	0,037
93	5	140	1000	60,00	04.02.2011	Filtration	UC-Digest	406	Mo 98(MR)	0,523	5,3	0,0314	3,27E-10	0,327
94	5	20	1000	60,00	04.02.2011	Filtration	UC-Digest	407	Mo 98(MR)	0,062	17,5	0,0037	3,88E-11	0,039
95	5	10	250	60,00	04.02.2011	Filtration	UC-Digest	408	Mo 98(MR)	0,018	8,1	0,0044	4,62E-11	0,046
96	5	2	200	60,00	04.02.2011	Filtration	UC-Digest	409	Mo 98(MR)	0,021	21,5	0,0062	6,45E-11	0,064
97	5	0,2	200	60,00	04.02.2011	Filtration	UC-Digest	410	Mo 98(MR)	0,016	11,3	0,0047	4,92E-11	0,049
98	6	140	2000	60,00	05.02.2011	Filtration	UC-Digest	411	Mo 98(MR)	0,338	4,8	0,0101	1,06E-10	0,106
99	6	20	2000	60,00	05.02.2011	Filtration	UC-Digest	412	Mo 98(MR)	0,126	17,2	0,0038	3,94E-11	0,039
100	6	10	600	60,00	05.02.2011	Filtration	UC-Digest	413	Mo 98(MR)	-0,001	39,0	-0,0001	-5,30E-13	-0,001
101	6	2	400	60,00	05.02.2011	Filtration	UC-Digest	414	Mo 98(MR)	0,014	13,7	0,0021	2,15E-11	0,021
102	6	0,2	200	60,00	05.02.2011	Filtration	UC-Digest	415	Mo 98(MR)	0,013	16,6	0,0038	3,98E-11	0,040

103	7	140	2000	60,00	05.02.2011	Filtration	UC-Digest	416	Mo 98(MR)	0,319	1,8	0,0096	9,98E-11	0,100
104	7	20	1000	60,00	05.02.2011	Filtration	UC-Digest	417	Mo 98(MR)	0,041	7,1	0,0025	2,59E-11	0,026
105	7	10	400	60,92	05.02.2011	Filtration	UC-Digest	418	Mo 98(MR)	0,013	14,1	0,0020	2,12E-11	0,021
106	7	2	300	60,00	05.02.2011	Filtration	UC-Digest	419	Mo 98(MR)	0,006	10,6	0,0011	1,15E-11	0,011
107	7	0,2	200	60,00	05.02.2011	Filtration	UC-Digest	420	Mo 98(MR)	0,016	7,9	0,0047	4,95E-11	0,049
108	8	140	2000	60,00	05.02.2011	Filtration	UC-Digest	421	Mo 98(MR)	0,297	10,3	0,0089	9,28E-11	0,093
109	8	20	1000	60,00	05.02.2011	Filtration	UC-Digest	422	Mo 98(MR)	0,148	5,5	0,0089	9,28E-11	0,093
110	8	10	350	60,00	05.02.2011	Filtration	UC-Digest	423	Mo 98(MR)	0,021	5,8	0,0035	3,69E-11	0,037
111	8	2	200	60,00	05.02.2011	Filtration	UC-Digest	424	Mo 98(MR)	0,009	24,2	0,0026	2,69E-11	0,027
112	8	0,2	200	60,00	05.02.2011	Filtration	UC-Digest	425	Mo 98(MR)	0,027	21,9	0,0081	8,42E-11	0,084
113	9	140	2000	60,00	05.02.2011	Filtration	UC-Digest	426	Mo 98(MR)	0,169	3,8	0,0051	5,28E-11	0,053
114	9	20	1000	60,00	05.02.2011	Filtration	UC-Digest	427	Mo 98(MR)	0,076	6,6	0,0045	4,74E-11	0,047
115	9	10	350	60,00	05.02.2011	Filtration	UC-Digest	428	Mo 98(MR)	0,009	19,9	0,0015	1,52E-11	0,015
116	9	2	200	60,00	05.02.2011	Filtration	UC-Digest	429	Mo 98(MR)	0,007	32,0	0,0021	2,21E-11	0,022
117	9	0,2	200	60,00	05.02.2011	Filtration	UC-Digest	430	Mo 98(MR)	0,014	19,9	0,0041	4,27E-11	0,043
118	10	140	1000	61,44	05.02.2011	Filtration	UC-Digest	431	Mo 98(MR)	0,052	4,0	0,0032	3,35E-11	0,033
119	10	20	500	60,00	05.02.2011	Filtration	UC-Digest	432	Mo 98(MR)	0,029	23,0	0,0035	3,61E-11	0,036
120	10	10	350	60,00	05.02.2011	Filtration	UC-Digest	433	Mo 98(MR)	0,012	14,3	0,0020	2,07E-11	0,021
121	10	2	200	60,00	05.02.2011	Filtration	UC-Digest	434	Mo 98(MR)	0,009	9,4	0,0027	2,86E-11	0,029
122	10	0,2	120	60,00	05.02.2011	Filtration	UC-Digest	435	Mo 98(MR)	0,018	33,5	0,0089	9,33E-11	0,093
143	1	140	2000	60,00	13.02.2011	Filtration	UC-Digest	456	Mo 98(MR)	0,247	4,7	0,0074	7,73E-11	0,077
144	1	20	2000	60,00	13.02.2011	Filtration	UC-Digest	457	Mo 98(MR)	0,066	11,2	0,0020	2,06E-11	0,021
145	1	10	600	60,00	13.02.2011	Filtration	UC-Digest	458	Mo 98(MR)	0,007	23,2	0,0007	7,37E-12	0,007
146	1	2	400	60,00	13.02.2011	Filtration	UC-Digest	459	Mo 98(MR)	0,007	13,2	0,0010	1,04E-11	0,010
147	1	0,2	400	60,00	13.02.2011	Filtration	UC-Digest	460	Mo 98(MR)	0,007	18,2	0,0011	1,12E-11	0,011
148	2	140	2000	60,00	13.02.2011	Filtration	UC-Digest	461	Mo 98(MR)	0,417	2,4	0,0125	1,30E-10	0,130
149	2	20	2000	60,00	13.02.2011	Filtration	UC-Digest	462	Mo 98(MR)	0,101	5,8	0,0030	3,17E-11	0,032
150	2	10	400	60,00	13.02.2011	Filtration	UC-Digest	463	Mo 98(MR)	0,010	31,0	0,0014	1,50E-11	0,015
151	2	2	300	60,00	13.02.2011	Filtration	UC-Digest	464	Mo 98(MR)	0,011	12,7	0,0021	2,21E-11	0,022
152	2	0,2	200	60,00	13.02.2011	Filtration	UC-Digest	465	Mo 98(MR)	0,014	19,4	0,0043	4,49E-11	0,045
153	3	140	2000	60,00	13.02.2011	Filtration	UC-Digest	466	Mo 98(MR)	2,635	2,0	0,0791	8,24E-10	0,824
154	3	20	1000	60,00	13.02.2011	Filtration	UC-Digest	467	Mo 98(MR)	0,578	3,0	0,0347	3,62E-10	0,362
155	3	10	250	60,00	13.02.2011	Filtration	UC-Digest	468	Mo 98(MR)	0,011	12,4	0,0027	2,84E-11	0,028
156	3	2	150	60,00	13.02.2011	Filtration	UC-Digest	469	Mo 98(MR)	0,011	14,5	0,0043	4,51E-11	0,045

157	3	0,2	150	60,00	13.02.2011	Filtration	UC-Digest	470	Mo 98(MR)	0,028	2,3	0,0112	1,17E-10	0,117
158	4	140	2000	60,00	13.02.2011	Filtration	UC-Digest	471	Mo 98(MR)	0,507	4,5	0,0152	1,59E-10	0,159
159	4	20	1000	60,00	13.02.2011	Filtration	UC-Digest	472	Mo 98(MR)	0,056	26,3	0,0034	3,53E-11	0,035
160	4	10	250	60,00	13.02.2011	Filtration	UC-Digest	473	Mo 98(MR)	0,006	26,2	0,0015	1,54E-11	0,015
161	4	2	250	60,36	13.02.2011	Filtration	UC-Digest	474	Mo 98(MR)	0,010	33,3	0,0023	2,41E-11	0,024
162	4	0,2	200	60,00	13.02.2011	Filtration	UC-Digest	475	Mo 98(MR)	0,017	29,8	0,0051	5,31E-11	0,053
163	5	140	2000	60,00	13.02.2011	Filtration	UC-Digest	476	Mo 98(MR)	0,153	9,6	0,0046	4,78E-11	0,048
164	5	20	500	60,90	13.02.2011	Filtration	UC-Digest	477	Mo 98(MR)	0,036	2,9	0,0043	4,52E-11	0,045
165	5	10	200	60,00	13.02.2011	Filtration	UC-Digest	478	Mo 98(MR)	0,014	17,9	0,0041	4,30E-11	0,043
166	5	2	200	60,00	13.02.2011	Filtration	UC-Digest	479	Mo 98(MR)	0,008	18,8	0,0023	2,41E-11	0,024
167	5	0,2	200	60,00	13.02.2011	Filtration	UC-Digest	480	Mo 98(MR)	0,020	19,0	0,0060	6,25E-11	0,062
168	6	140	2000	60,00	14.02.2011	Filtration	UC-Digest	481	Mo 98(MR)	0,191	4,2	0,0057	5,97E-11	0,060
169	6	20	1000	60,00	14.02.2011	Filtration	UC-Digest	482	Mo 98(MR)	0,046	12,6	0,0028	2,90E-11	0,029
170	6	10	500	60,00	14.02.2011	Filtration	UC-Digest	483	Mo 98(MR)	0,010	7,3	0,0012	1,26E-11	0,013
171	6	2	300	60,00	14.02.2011	Filtration	UC-Digest	484	Mo 98(MR)	0,007	19,7	0,0015	1,52E-11	0,015
172	6	0,2	300	60,00	14.02.2011	Filtration	UC-Digest	485	Mo 98(MR)	0,020	11,4	0,0040	4,14E-11	0,041
173	7	140	2000	60,00	14.02.2011	Filtration	UC-Digest	486	Mo 98(MR)	0,197	7,1	0,0059	6,15E-11	0,062
174	7	20	1000	60,00	14.02.2011	Filtration	UC-Digest	487	Mo 98(MR)	0,030	3,1	0,0018	1,87E-11	0,019
175	7	10	395	60,00	14.02.2011	Filtration	UC-Digest	488	Mo 98(MR)	0,008	34,1	0,0012	1,28E-11	0,013
176	7	2	200	60,00	14.02.2011	Filtration	UC-Digest	489	Mo 98(MR)	0,008	14,7	0,0024	2,50E-11	0,025
177	7	0,2	200	60,00	14.02.2011	Filtration	UC-Digest	490	Mo 98(MR)	0,016	16,0	0,0048	5,04E-11	0,050
178	8	140	2000	60,00	14.02.2011	Filtration	UC-Digest	491	Mo 98(MR)	0,863	4,4	0,0259	2,70E-10	0,270
179	8	20	1000	60,00	14.02.2011	Filtration	UC-Digest	492	Mo 98(MR)	0,100	13,0	0,0060	6,25E-11	0,063
180	8	10	300	60,00	14.02.2011	Filtration	UC-Digest	493	Mo 98(MR)	0,010	7,7	0,0021	2,17E-11	0,022
181	8	2	100	60,00	14.02.2011	Filtration	UC-Digest	494	Mo 98(MR)	0,006	28,0	0,0037	3,84E-11	0,038
182	8	0,2	200	60,00	14.02.2011	Filtration	UC-Digest	495	Mo 98(MR)	0,014	16,5	0,0043	4,45E-11	0,045
183	9	140	2000	60,00	14.02.2011	Filtration	UC-Digest	496	Mo 98(MR)	0,570	6,7	0,0171	1,78E-10	0,178
184	9	20	1000	60,00	14.02.2011	Filtration	UC-Digest	497	Mo 98(MR)	0,053	4,3	0,0032	3,31E-11	0,033
185	9	10	150	60,00	14.02.2011	Filtration	UC-Digest	498	Mo 98(MR)	0,010	1,5	0,0040	4,16E-11	0,042
186	9	2	150	60,00	14.02.2011	Filtration	UC-Digest	499	Mo 98(MR)	0,002	15,2	0,0009	9,54E-12	0,010
187	9	0,2	150	60,00	14.02.2011	Filtration	UC-Digest	500	Mo 98(MR)	0,014	21,8	0,0056	5,81E-11	0,058
188	10	140	1500	60,00	14.02.2011	Filtration	UC-Digest	501	Mo 98(MR)	0,039	8,9	0,0016	1,64E-11	0,016
189	10	20	500	60,00	14.02.2011	Filtration	UC-Digest	502	Mo 98(MR)	0,025	13,0	0,0029	3,07E-11	0,031
190	10	10	130	60,00	14.02.2011	Filtration	UC-Digest	503	Mo 98(MR)	0,013	9,6	0,0059	6,13E-11	0,061

191	10	2	55	61,47	14.02.2011	Filtration	UC-Digest	504	Mo 98(MR)	0,020	10,4	0,0229	2,38E-10	0,238
192	10	0,2	55	60,49	14.02.2011	Filtration	UC-Digest	505	Mo 98(MR)	0,017	11,8	0,0190	1,98E-10	0,198

Table C10: Results sheet Direct samples; molybdenum

								Concentration				
								Uncorrected		Corrected		
Smpl	**Tank/Depth**	**Fract**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
1	10 m	P	23.01.2011	Depth	Direct	529	Mo 98(MR)	0,394	3,7	3,94E-03	4,11E-11	0,041
1	10 m	P	23.01.2011	Depth	Direct	529	Mo 98(MR)	0,398	1,3	3,98E-03	4,15E-11	0,042
3	10 m	D	23.01.2011	Depth	Direct	530	Mo 98(MR)	0,348	8,1	3,48E-03	3,63E-11	0,036
5	5	P	23.01.2011	Tank	Direct	531	Mo 98(MR)	0,405	5,3	4,05E-03	4,22E-11	0,042
7	5	D	23.01.2011	Tank	Direct	532	Mo 98(MR)	0,406	3,2	4,06E-03	4,24E-11	0,042
9	Brk	P	24.01.2011	Depth	Direct	533	Mo 98(MR)	0,314	4,9	3,14E-03	3,27E-11	0,033
11	Brk	D	24.01.2011	Depth	Direct	534	Mo 98(MR)	0,415	2,2	4,15E-03	4,33E-11	0,043
13	1	P	26.01.2011	Tank	Direct	535	Mo 98(MR)	0,353	5,5	3,53E-03	3,68E-11	0,037
15	1	D	26.01.2011	Tank	Direct	536	Mo 98(MR)	0,493	5,1	4,93E-03	5,14E-11	0,051
17	2	P	26.01.2011	Tank	Direct	537	Mo 98(MR)	0,465	0,9	4,65E-03	4,85E-11	0,048
19	2	D	26.01.2011	Tank	Direct	538	Mo 98(MR)	0,436	5,8	4,36E-03	4,55E-11	0,045
21	3	P	26.01.2011	Tank	Direct	539	Mo 98(MR)	0,476	4,9	4,76E-03	4,96E-11	0,050
23	3	D	26.01.2011	Tank	Direct	540	Mo 98(MR)	0,399	1,0	3,99E-03	4,16E-11	0,042
23	3	D	23.01.2011	Tank	Direct		Mo 98(MR)	0,401	9,4	4,01E-03	4,18E-11	0,042
25	4	P	26.01.2011	Tank	Direct	541	Mo 98(MR)	0,383	8,2	3,83E-03	3,99E-11	0,040
27	4	D	26.01.2011	Tank	Direct	542	Mo 98(MR)	0,408	6,7	4,08E-03	4,26E-11	0,043
29	5	P	26.01.2011	Tank	Direct	543	Mo 98(MR)	0,392	6,1	3,92E-03	4,09E-11	0,041
31	5	D	26.01.2011	Tank	Direct	544	Mo 98(MR)	0,538	6,6	5,38E-03	5,61E-11	0,056
33	6	P	27.01.2011	Tank	Direct	545	Mo 98(MR)	0,582	3,2	5,82E-03	6,07E-11	0,061

35	6	D	27.01.2011	Tank	Direct	546	Mo 98(MR)	0,471	5,0	4,71E-03	4,91E-11	0,049
37	7	P	27.01.2011	Tank	Direct	547	Mo 98(MR)	0,412	16,5	4,12E-03	4,30E-11	0,043
39	7	D	27.01.2011	Tank	Direct	548	Mo 98(MR)	0,387	4,7	3,87E-03	4,04E-11	0,040
41	8	P	27.01.2011	Tank	Direct	549	Mo 98(MR)	0,348	8,3	3,48E-03	3,63E-11	0,036
43	8	D	27.01.2011	Tank	Direct	550	Mo 98(MR)	0,534	1,4	5,34E-03	5,57E-11	0,056
45	9	P	27.01.2011	Tank	Direct	551	Mo 98(MR)	0,424	25,0	4,24E-03	4,42E-11	0,044
47	9	D	27.01.2011	Tank	Direct	552	Mo 98(MR)	0,486	19,1	4,86E-03	5,07E-11	0,051
49	10	P	27.01.2011	Tank	Direct	553	Mo 98(MR)	0,275	27,2	2,75E-03	2,87E-11	0,029
51	10	D	27.01.2011	Tank	Direct	554	Mo 98(MR)	0,690	7,8	6,90E-03	7,19E-11	0,072
53	1	P	29.01.2011	Tank	Direct	555	Mo 98(MR)	0,446	1,6	4,46E-03	4,65E-11	0,047
55	1	D	29.01.2011	Tank	Direct	556	Mo 98(MR)	0,381	9,7	3,81E-03	3,97E-11	0,040
57	2	P	29.01.2011	Tank	Direct	557	Mo 98(MR)	0,482	7,3	4,82E-03	5,02E-11	0,050
59	2	D	29.01.2011	Tank	Direct	558	Mo 98(MR)	0,406	19,8	4,06E-03	4,23E-11	0,042
61	3	P	29.01.2011	Tank	Direct	559	Mo 98(MR)	0,297	11,0	2,97E-03	3,09E-11	0,031
63	3	D	29.01.2011	Tank	Direct	560	Mo 98(MR)	0,480	9,1	4,80E-03	5,01E-11	0,050
65	4	P	29.01.2011	Tank	Direct	561	Mo 98(MR)	0,336	1,9	3,36E-03	3,50E-11	0,035
67	4	D	29.01.2011	Tank	Direct	562	Mo 98(MR)	0,547	8,9	5,47E-03	5,71E-11	0,057
69	5	P	29.01.2011	Tank	Direct	563	Mo 98(MR)	0,578	7,9	5,78E-03	6,03E-11	0,060
71	5	D	29.01.2011	Tank	Direct	564	Mo 98(MR)	0,491	2,3	4,91E-03	5,12E-11	0,051
73	6	P	30.01.2011	Tank	Direct	565	Mo 98(MR)	0,586	4,3	5,86E-03	6,11E-11	0,061
75	6	D	30.01.2011	Tank	Direct	566	Mo 98(MR)	0,575	4,6	5,75E-03	5,99E-11	0,060
77	7	P	30.01.2011	Tank	Direct	567	Mo 98(MR)	0,532	4,6	5,32E-03	5,55E-11	0,055
79	7	D	30.01.2011	Tank	Direct	568	Mo 98(MR)	0,527	9,0	5,27E-03	5,49E-11	0,055
81	8	P	30.01.2011	Tank	Direct	569	Mo 98(MR)	0,537	4,6	5,37E-03	5,60E-11	0,056
83	8	D	30.01.2011	Tank	Direct	570	Mo 98(MR)	0,638	3,1	6,38E-03	6,65E-11	0,067
85	9	P	30.01.2011	Tank	Direct	571	Mo 98(MR)	0,607	7,9	6,07E-03	6,33E-11	0,063
87	9	D	30.01.2011	Tank	Direct	572	Mo 98(MR)	0,669	9,4	6,69E-03	6,97E-11	0,070
89	10	P	30.01.2011	Tank	Direct	573	Mo 98(MR)	0,630	1,4	6,30E-03	6,57E-11	0,066
91	10	D	30.01.2011	Tank	Direct	574	Mo 98(MR)	0,463	8,7	4,63E-03	4,83E-11	0,048

93	1	P	01.02.2011	Tank	Direct	575	Mo 98(MR)	0,531	4,5	5,31E-03	5,53E-11	0,055
95	1	D	01.02.2011	Tank	Direct	576	Mo 98(MR)	0,528	1,7	5,28E-03	5,51E-11	0,055
97	2	P	01.02.2011	Tank	Direct	577	Mo 98(MR)	0,690	7,4	6,90E-03	7,20E-11	0,072
99	2	D	01.02.2011	Tank	Direct	578	Mo 98(MR)	0,639	2,8	6,39E-03	6,66E-11	0,067
101	3	P	01.02.2011	Tank	Direct	579	Mo 98(MR)	0,660	8,6	6,60E-03	6,88E-11	0,069
103	3	D	01.02.2011	Tank	Direct	580	Mo 98(MR)	0,759	6,4	7,59E-03	7,91E-11	0,079
105	4	P	01.02.2011	Tank	Direct	581	Mo 98(MR)	0,611	5,4	6,11E-03	6,37E-11	0,064
107	4	D	01.02.2011	Tank	Direct	582	Mo 98(MR)	0,639	0,7	6,39E-03	6,66E-11	0,067
109	5	P	01.02.2011	Tank	Direct	583	Mo 98(MR)	0,707	7,3	7,07E-03	7,37E-11	0,074
111	5	D	01.02.2011	Tank	Direct	584	Mo 98(MR)	0,661	6,1	6,61E-03	6,90E-11	0,069
113	6	P	02.02.2011	Tank	Direct	585	Mo 98(MR)	0,743	6,3	7,43E-03	7,75E-11	0,078
115	6	D	02.02.2011	Tank	Direct	586	Mo 98(MR)	0,835	4,0	8,35E-03	8,71E-11	0,087
117	7	P	02.02.2011	Tank	Direct	587	Mo 98(MR)	0,761	7,4	7,61E-03	7,93E-11	0,079
119	7	D	02.02.2011	Tank	Direct	588	Mo 98(MR)	0,679	6,2	6,79E-03	7,08E-11	0,071
121	8	P	02.02.2011	Tank	Direct	589	Mo 98(MR)	0,583	3,1	5,83E-03	6,08E-11	0,061
123	8	D	02.02.2011	Tank	Direct	590	Mo 98(MR)	0,636	5,7	6,36E-03	6,64E-11	0,066
125	9	P	02.02.2011	Tank	Direct	591	Mo 98(MR)	0,385	22,5	3,85E-03	4,01E-11	0,040
127	9	D	02.02.2011	Tank	Direct	592	Mo 98(MR)	0,713	1,9	7,13E-03	7,43E-11	0,074
129	10	P	02.02.2011	Tank	Direct	593	Mo 98(MR)	0,709	5,9	7,09E-03	7,39E-11	0,074
131	10	D	02.02.2011	Tank	Direct	594	Mo 98(MR)	0,785	4,2	7,85E-03	8,19E-11	0,082
133	1	P	04.02.2011	Tank	Direct	595	Mo 98(MR)	0,696	6,2	6,96E-03	7,26E-11	0,073
135	1	D	04.02.2011	Tank	Direct	596	Mo 98(MR)	0,307	10,2	3,07E-03	3,20E-11	0,032
137	2	P	04.02.2011	Tank	Direct	597	Mo 98(MR)	0,585	9,5	5,85E-03	6,10E-11	0,061
139	2	D	04.02.2011	Tank	Direct	598	Mo 98(MR)	0,624	0,8	6,24E-03	6,51E-11	0,065
141	3	P	04.02.2011	Tank	Direct	599	Mo 98(MR)	0,737	16,1	7,37E-03	7,68E-11	0,077
143	3	D	04.02.2011	Tank	Direct	600	Mo 98(MR)	0,768	6,6	7,68E-03	8,01E-11	0,080
145	4	P	04.02.2011	Tank	Direct	601	Mo 98(MR)	0,353	19,4	3,53E-03	3,69E-11	0,037
147	4	D	04.02.2011	Tank	Direct	602	Mo 98(MR)	0,759	12,8	7,59E-03	7,91E-11	0,079
149	5	P	04.02.2011	Tank	Direct	603	Mo 98(MR)	0,697	9,4	6,97E-03	7,27E-11	0,073

151	5	D	04.02.2011	Tank	Direct	604	Mo 98(MR)	0,231	24,7	2,31E-03	2,41E-11	0,024
153	6	P	05.02.2011	Tank	Direct	605	Mo 98(MR)	0,225	9,9	2,25E-03	2,35E-11	0,023
154	6	D	05.02.2011	Tank	Direct	606	Mo 98(MR)	0,621	2,1	6,21E-03	6,48E-11	0,065
155	7	P	05.02.2011	Tank	Direct	607	Mo 98(MR)	0,675	6,6	6,75E-03	7,04E-11	0,070
156	7	D	05.02.2011	Tank	Direct	608	Mo 98(MR)	0,206	13,6	2,06E-03	2,15E-11	0,022
157	8	P	05.02.2011	Tank	Direct	609	Mo 98(MR)	0,645	3,3	6,45E-03	6,73E-11	0,067
158	8	D	05.02.2011	Tank	Direct	610	Mo 98(MR)	0,581	17,6	5,81E-03	6,06E-11	0,061
159	9	P	05.02.2011	Tank	Direct	611	Mo 98(MR)	0,646	8,9	6,46E-03	6,74E-11	0,067
160	9	D	05.02.2011	Tank	Direct	612	Mo 98(MR)	0,675	8,1	6,75E-03	7,04E-11	0,070
161	10	P	05.02.2011	Tank	Direct	613	Mo 98(MR)	1,120	11,8	1,12E-02	1,17E-10	0,117
162	10	D	05.02.2011	Tank	Direct	614	Mo 98(MR)	0,549	6,0	5,49E-03	5,72E-11	0,057
163	1	P	07.02.2011	Tank	Direct	615	Mo 98(MR)	0,592	3,5	5,92E-03	6,17E-11	0,062
164	1	D	07.02.2011	Tank	Direct	616	Mo 98(MR)	0,552	6,3	5,52E-03	5,75E-11	0,058
165	2	P	07.02.2011	Tank	Direct	617	Mo 98(MR)	0,623	14,3	6,23E-03	6,50E-11	0,065
166	2	D	07.02.2011	Tank	Direct	618	Mo 98(MR)	0,815	5,0	8,15E-03	8,50E-11	0,085
167	3	P	07.02.2011	Tank	Direct	619	Mo 98(MR)	0,595	3,6	5,95E-03	6,20E-11	0,062
168	3	D	07.02.2011	Tank	Direct	620	Mo 98(MR)	0,734	9,9	7,34E-03	7,65E-11	0,076
169	4	P	07.02.2011	Tank	Direct	621	Mo 98(MR)	0,491	5,4	4,91E-03	5,12E-11	0,051
170	4	D	07.02.2011	Tank	Direct	622	Mo 98(MR)	0,325	11,5	3,25E-03	3,39E-11	0,034
171	5	P	07.02.2011	Tank	Direct	623	Mo 98(MR)	0,625	7,5	6,25E-03	6,52E-11	0,065
172	5	D	07.02.2011	Tank	Direct	624	Mo 98(MR)	0,587	2,0	5,87E-03	6,12E-11	0,061
173	6	P	08.02.2011	Tank	Direct	625	Mo 98(MR)	0,430	12,2	4,30E-03	4,48E-11	0,045
174	6	D	08.02.2011	Tank	Direct	626	Mo 98(MR)	0,442	5,4	4,42E-03	4,61E-11	0,046
175	7	P	08.02.2011	Tank	Direct	627	Mo 98(MR)	0,577	12,7	5,77E-03	6,02E-11	0,060
176	7	D	08.02.2011	Tank	Direct	628	Mo 98(MR)	0,394	11,9	3,94E-03	4,11E-11	0,041
177	8	P	08.02.2011	Tank	Direct	629	Mo 98(MR)	0,427	10,9	4,27E-03	4,45E-11	0,044
178	8	D	08.02.2011	Tank	Direct	630	Mo 98(MR)	0,492	13,9	4,92E-03	5,13E-11	0,051
179	9	P	08.02.2011	Tank	Direct	631	Mo 98(MR)	0,444	20,5	4,44E-03	4,63E-11	0,046
180	9	D	08.02.2011	Tank	Direct	632	Mo 98(MR)	0,611	8,6	6,11E-03	6,37E-11	0,064

181	10	P	08.02.2011	Tank	Direct	633	Mo 98(MR)	0,501	1,6	5,01E-03	5,22E-11	0,052
182	10	D	08.02.2011	Tank	Direct	634	Mo 98(MR)	0,497	3,2	4,97E-03	5,18E-11	0,052
183	1	P	10.02.2011	Tank	Direct	635	Mo 98(MR)	0,624	14,4	6,24E-03	6,51E-11	0,065
184	1	D	10.02.2011	Tank	Direct	636	Mo 98(MR)	0,536	7,6	5,36E-03	5,58E-11	0,056
185	2	P	10.02.2011	Tank	Direct	637	Mo 98(MR)	0,543	7,6	5,43E-03	5,66E-11	0,057
186	2	D	10.02.2011	Tank	Direct	638	Mo 98(MR)	0,492	10,7	4,92E-03	5,13E-11	0,051
187	3	P	10.02.2011	Tank	Direct	639	Mo 98(MR)	0,513	3,9	5,13E-03	5,35E-11	0,054
188	3	D	10.02.2011	Tank	Direct	640	Mo 98(MR)	0,682	4,7	6,82E-03	7,11E-11	0,071
189	4	P	10.02.2011	Tank	Direct	641	Mo 98(MR)	0,457	11,2	4,57E-03	4,77E-11	0,048
190	4	D	10.02.2011	Tank	Direct	642	Mo 98(MR)	0,633	3,9	6,33E-03	6,61E-11	0,066
191	5	P	10.02.2011	Tank	Direct	643	Mo 98(MR)	0,536	9,9	5,36E-03	5,59E-11	0,056
192	5	D	10.02.2011	Tank	Direct	644	Mo 98(MR)	0,622	15,6	6,22E-03	6,49E-11	0,065
193	6	P	11.02.2011	Tank	Direct	645	Mo 98(MR)	0,452	4,4	4,52E-03	4,71E-11	0,047
194	6	D	11.02.2011	Tank	Direct	646	Mo 98(MR)	0,567	8,2	5,67E-03	5,91E-11	0,059
195	7	P	11.02.2011	Tank	Direct	647	Mo 98(MR)	0,543	9,9	5,43E-03	5,66E-11	0,057
196	7	D	11.02.2011	Tank	Direct	648	Mo 98(MR)	0,631	4,1	6,31E-03	6,57E-11	0,066
197	8	P	11.02.2011	Tank	Direct	649	Mo 98(MR)	0,493	11,4	4,93E-03	5,14E-11	0,051
198	8	D	11.02.2011	Tank	Direct	650	Mo 98(MR)	0,497	7,1	4,97E-03	5,18E-11	0,052
199	9	P	11.02.2011	Tank	Direct	651	Mo 98(MR)	0,407	8,2	4,07E-03	4,25E-11	0,042
200	9	D	11.02.2011	Tank	Direct	652	Mo 98(MR)	0,571	7,6	5,71E-03	5,95E-11	0,059
201	10	P	11.02.2011	Tank	Direct	653	Mo 98(MR)	0,510	7,8	5,10E-03	5,32E-11	0,053
202	10	D	11.02.2011	Tank	Direct	654	Mo 98(MR)	0,544	15,9	5,44E-03	5,67E-11	0,057
203	1	P	13.02.2011	Tank	Direct	655	Mo 98(MR)	0,532	5,7	5,32E-03	5,54E-11	0,055
204	1	D	13.02.2011	Tank	Direct	656	Mo 98(MR)	0,366	6,7	3,66E-03	3,82E-11	0,038
205	2	P	13.02.2011	Tank	Direct	657	Mo 98(MR)	0,571	2,7	5,71E-03	5,95E-11	0,060
206	2	D	13.02.2011	Tank	Direct	658	Mo 98(MR)	0,658	1,1	6,58E-03	6,86E-11	0,069
207	3	P	13.02.2011	Tank	Direct	659	Mo 98(MR)	0,566	5,7	5,66E-03	5,91E-11	0,059
208	3	D	13.02.2011	Tank	Direct	660	Mo 98(MR)	0,674	0,8	6,74E-03	7,03E-11	0,070
209	4	P	13.02.2011	Tank	Direct	661	Mo 98(MR)	0,466	6,7	4,66E-03	4,86E-11	0,049

210	4	D	13.02.2011	Tank	Direct	662	Mo 98(MR)	0,559	2,9	5,59E-03	5,83E-11	0,058
211	5	P	13.02.2011	Tank	Direct	663	Mo 98(MR)	0,535	7,4	5,35E-03	5,57E-11	0,056
212	5	D	13.02.2011	Tank	Direct	664	Mo 98(MR)	0,638	5,9	6,38E-03	6,66E-11	0,067
213	6	P	14.02.2011	Tank	Direct	665	Mo 98(MR)	0,510	4,8	5,10E-03	5,32E-11	0,053
214	6	D	14.02.2011	Tank	Direct	666	Mo 98(MR)	0,510	11,6	5,10E-03	5,31E-11	0,053
215	7	P	14.02.2011	Tank	Direct	667	Mo 98(MR)	0,542	6,7	5,42E-03	5,65E-11	0,056
216	7	D	14.02.2011	Tank	Direct	668	Mo 98(MR)	0,589	9,7	5,89E-03	6,15E-11	0,061
217	8	P	14.02.2011	Tank	Direct	669	Mo 98(MR)	0,615	8,8	6,15E-03	6,41E-11	0,064
218	8	D	14.02.2011	Tank	Direct	670	Mo 98(MR)	0,499	8,1	4,99E-03	5,20E-11	0,052
219	9	P	14.02.2011	Tank	Direct	671	Mo 98(MR)	0,613	4,7	6,13E-03	6,39E-11	0,064
220	9	D	14.02.2011	Tank	Direct	672	Mo 98(MR)	0,487	4,4	4,87E-03	5,08E-11	0,051
221	10	P	14.02.2011	Tank	Direct	673	Mo 98(MR)	0,458	6,3	4,58E-03	4,78E-11	0,048
222	10	D	14.02.2011	Tank	Direct	674	Mo 98(MR)	0,474	8,6	4,74E-03	4,94E-11	0,049
	0 m	P		Depth Profile	Direct	675	Mo 98(MR)	-0,229	3,4	-2,29E-03	-2,39E-11	-0,024
	0 m	D		Depth Profile	Direct	676	Mo 98(MR)	-0,300	0,9	-3,00E-03	-3,12E-11	-0,031
	4 m	P		Depth Profile	Direct	677	Mo 98(MR)	0,538	7,3	5,38E-03	5,61E-11	0,056
	4 m	D		Depth Profile	Direct	678	Mo 98(MR)	0,582	11,2	5,82E-03	6,07E-11	0,061
	10 m	P		Depth Profile	Direct	679	Mo 98(MR)	0,608	5,4	6,08E-03	6,34E-11	0,063
	10 m	D		Depth Profile	Direct	680	Mo 98(MR)	0,720	9,2	7,20E-03	7,51E-11	0,075
	30 m	P		Depth Profile	Direct	681	Mo 98(MR)	0,570	5,1	5,70E-03	5,94E-11	0,059
	30 m	D		Depth Profile	Direct	682	Mo 98(MR)	0,665	16,1	6,65E-03	6,94E-11	0,069
	50 m	P		Depth Profile	Direct	683	Mo 98(MR)	0,711	18,1	7,11E-03	7,42E-11	0,074
	50 m	D		Depth Profile	Direct	684	Mo 98(MR)	0,670	5,7	6,70E-03	6,99E-11	0,070
	70 m	P		Depth Profile	Direct	685	Mo 98(MR)	0,482	9,1	4,82E-03	5,03E-11	0,050
	70 m	D		Depth Profile	Direct	686	Mo 98(MR)	0,658	8,0	6,58E-03	6,86E-11	0,069
A		P		River	Direct	687	Mo 98(MR)	-0,480	6,2	-4,80E-03	-5,00E-11	-0,050
A		D		River	Direct	688	Mo 98(MR)	-0,481	9,2	-4,81E-03	-5,01E-11	-0,050
B		P		River	Direct	689	Mo 98(MR)	-0,627	7,4	-6,27E-03	-6,54E-11	-0,065
B		D		River	Direct	690	Mo 98(MR)	-0,622	12,1	-6,22E-03	-6,49E-11	-0,065

C		P		River	Direct	691	Mo 98(MR)	-0,623	19,9	-6,23E-03	-6,50E-11	-0,065
C		D		River	Direct	692	Mo 98(MR)	-0,623	9,0	-6,23E-03	-6,49E-11	-0,065

Table C11: Results sheet Chelex samples; nickel

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-lnr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
1	10 m	P	159	23.01.2011	Depth	Chelex	1	Ni 60(MR)	4,43	7,5	0,139	2,38E-09	2,38
2	10 m	D	166	23.01.2011	Depth	Chelex	2	Ni 60(MR)	4,54	3,9	0,137	2,33E-09	2,33
3	5	P	153	23.01.2011	Tank	Chelex	3	Ni 60(MR)	4,70	2,7	0,153	2,61E-09	2,61
4	5	D	170	24.01.2011	Tank	Chelex	4	Ni 60(MR)	4,60	10,4	0,136	2,31E-09	2,31
5	Brk	P	151	24.01.2011	Depth	Chelex	5	Ni 60(MR)	4,32	5,0	0,143	2,44E-09	2,44
6	Brk	D	160	24.01.2011	Depth	Chelex	6	Ni 60(MR)	5,09	4,7	0,159	2,72E-09	2,72
7	1	P	165	26.01.2011	Tank	Chelex	7	Ni 60(MR)	15,86	1,4	0,480	8,17E-09	8,17
8	1	D	164	26.01.2011	Tank	Chelex	8	Ni 60(MR)	4,57	15,5	0,139	2,38E-09	2,38
9	2	P	167	26.01.2011	Tank	Chelex	9	Ni 60(MR)	7,18	7,2	0,214	3,65E-09	3,65
10	2	D	159	26.01.2011	Tank	Chelex	10	Ni 60(MR)	8,51	2,9	0,267	4,55E-09	4,55
11	3	P	149	26.01.2011	Tank	Chelex	11	Ni 60(MR)	6,98	4,1	0,234	3,98E-09	3,98
12	3	D	176	26.01.2011	Tank	Chelex	12	Ni 60(MR)	9,56	2,6	0,271	4,62E-09	4,62
13	4	P	143	26.01.2011	Tank	Chelex	13	Ni 60(MR)	9,86	2,3	0,344	5,86E-09	5,86
14	4	D	173	26.01.2011	Tank	Chelex	14	Ni 60(MR)	12,63	6,7	0,366	6,23E-09	6,23
15	5	P	143	26.01.2011	Tank	Chelex	15	Ni 60(MR)	14,02	8,6	0,491	8,37E-09	8,37
16	5	D	162	26.01.2011	Tank	Chelex	16	Ni 60(MR)	13,03	2,2	0,403	6,86E-09	6,86
17	6	P	161	27.01.2011	Tank	Chelex	17	Ni 60(MR)	4,22	5,7	0,131	2,24E-09	2,24
18	6	D	175	27.01.2011	Tank	Chelex	18	Ni 60(MR)	5,12	10,4	0,147	2,50E-09	2,50
19	7	P	176	27.01.2011	Tank	Chelex	19	Ni 60(MR)	4,31	4,8	0,123	2,09E-09	2,09
20	7	D	143	27.01.2011	Tank	Chelex	20	Ni 60(MR)	3,28	7,4	0,114	1,95E-09	1,95
21	8	P	159	27.01.2011	Tank	Chelex	21	Ni 60(MR)	3,84	0,7	0,121	2,05E-09	2,05

22	8	D	157	27.01.2011	Tank	Chelex	22	Ni 60(MR)	4,52	2,1	0,144	2,45E-09	2,45
23	9	P	183	27.01.2011	Tank	Chelex	23	Ni 60(MR)	4,60	5,6	0,126	2,14E-09	2,14
24	9	D	158	27.01.2011	Tank	Chelex	24	Ni 60(MR)	5,12	6,3	0,162	2,76E-09	2,76
25	10	P	176	27.01.2011	Tank	Chelex	25	Ni 60(MR)	5,13	3,0	0,146	2,49E-09	2,49
26	10	D	164	27.01.2011	Tank	Chelex	26	Ni 60(MR)	6,05	1,7	0,184	3,14E-09	3,14
27	1	P	184	29.01.2011	Tank	Chelex	27	Ni 60(MR)	3,77	0,9	0,103	1,75E-09	1,75
28	1	D	173	29.01.2011	Tank	Chelex	28	Ni 60(MR)	5,23	1,8	0,151	2,58E-09	2,58
29	2	P	176	29.01.2011	Tank	Chelex	29	Ni 60(MR)	4,67	2,6	0,133	2,26E-09	2,26
30	2	D	116	29.01.2011	Tank	Chelex	30	Ni 60(MR)	4,56	0,6	0,197	3,36E-09	3,36
31	3	P	180	29.01.2011	Tank	Chelex	31	Ni 60(MR)	10,49	2,2	0,291	4,96E-09	4,96
32	3	D	112	29.01.2011	Tank	Chelex	32	Ni 60(MR)	3,59	6,2	0,161	2,74E-09	2,74
33	4	P	159	29.01.2011	Tank	Chelex	33	Ni 60(MR)	12,21	2,4	0,385	6,56E-09	6,56
34	4	D	161	29.01.2011	Tank	Chelex	34	Ni 60(MR)	6,38	10,2	0,199	3,38E-09	3,38
35	5	P	160	29.01.2011	Tank	Chelex	35	Ni 60(MR)	3,38	7,8	0,106	1,81E-09	1,81
36	5	D	161	29.01.2011	Tank	Chelex	36	Ni 60(MR)	4,73	3,6	0,147	2,50E-09	2,50
37	6	P	117	30.01.2011	Tank	Chelex	37	Ni 60(MR)	3,57	3,0	0,152	2,60E-09	2,60
38	6	D	123	30.01.2011	Tank	Chelex	38	Ni 60(MR)	2,94	1,3	0,119	2,03E-09	2,03
39	7	P	125	30.01.2011	Tank	Chelex	39	Ni 60(MR)	2,87	2,6	0,115	1,96E-09	1,96
40	7	D	131	30.01.2011	Tank	Chelex	40	Ni 60(MR)	2,92	6,0	0,111	1,90E-09	1,90
41	8	P	111	30.01.2011	Tank	Chelex	41	Ni 60(MR)	3,11	1,9	0,140	2,39E-09	2,39
42	8	D	124	30.01.2011	Tank	Chelex	42	Ni 60(MR)	2,93	5,2	0,118	2,01E-09	2,01
43	9	P	125	30.01.2011	Tank	Chelex	43	Ni 60(MR)	2,75	3,4	0,110	1,87E-09	1,87
44	9	D	128	30.01.2011	Tank	Chelex	44	Ni 60(MR)	3,09	1,9	0,121	2,06E-09	2,06
45	10	P	122	30.01.2011	Tank	Chelex	45	Ni 60(MR)	3,39	3,7	0,139	2,37E-09	2,37
46	10	D	126	30.01.2011	Tank	Chelex	46	Ni 60(MR)	2,58	3,9	0,102	1,74E-09	1,74
47	1	P	161	04.02.2011	Tank	Chelex	47	Ni 60(MR)	5,20	3,2	0,161	2,74E-09	2,74
48	1	D	120	04.02.2011	Tank	Chelex	48	Ni 60(MR)	4,60	4,9	0,191	3,26E-09	3,26
49	2	P	112	04.02.2011	Tank	Chelex	49	Ni 60(MR)	3,24	2,5	0,144	2,46E-09	2,46
50	2	D	114	04.02.2011	Tank	Chelex	50	Ni 60(MR)	4,44	3,7	0,194	3,31E-09	3,31
51	3	P	116	04.02.2011	Tank	Chelex	51	Ni 60(MR)	4,81	1,1	0,207	3,52E-09	3,52
52	3	D	116	04.02.2011	Tank	Chelex	52	Ni 60(MR)	2,34	7,6	0,101	1,72E-09	1,72
53	4	P	152	04.02.2011	Tank	Chelex	53	Ni 60(MR)	5,07	6,3	0,166	2,83E-09	2,83
53	4	P	152	04.02.2011	Tank	Chelex	53	Ni 60(MR)	5,55	1,0	0,182	3,10E-09	3,10
54	4	D	150	04.02.2011	Tank	Chelex	54	Ni 60(MR)	4,84	3,7	0,162	2,75E-09	2,75

55	5	P	169	04.02.2011	Tank	Chelex	55	Ni 60(MR)	7,65	1,5	0,226	3,85E-09	3,85
56	5	D	140	04.02.2011	Tank	Chelex	56	Ni 60(MR)	3,88	0,8	0,139	2,36E-09	2,36
57	6	P	182	05.02.2011	Tank	Chelex	57	Ni 60(MR)	5,49	1,0	0,151	2,57E-09	2,57
58	6	D	174	05.02.2011	Tank	Chelex	58	Ni 60(MR)	1,38	4,9	0,040	6,76E-10	0,68
59	7	P	155	05.02.2011	Tank	Chelex	59	Ni 60(MR)	4,99	3,2	0,161	2,74E-09	2,74
60	7	D	160	05.02.2011	Tank	Chelex	60	Ni 60(MR)	7,80	2,8	0,244	4,15E-09	4,15
61	8	P	152	05.02.2011	Tank	Chelex	61	Ni 60(MR)	3,22	1,0	0,106	1,81E-09	1,81
62	8	D	155	05.02.2011	Tank	Chelex	62	Ni 60(MR)	3,39	4,2	0,109	1,86E-09	1,86
63	9	P	173	05.02.2011	Tank	Chelex	63	Ni 60(MR)	2,48	0,8	0,072	1,22E-09	1,22
64	9	D	161	05.02.2011	Tank	Chelex	64	Ni 60(MR)	3,41	4,0	0,106	1,81E-09	1,81
65	10	P	144	05.02.2011	Tank	Chelex	65	Ni 60(MR)	4,47	1,9	0,156	2,65E-09	2,65
66	10	D	166	05.02.2011	Tank	Chelex	66	Ni 60(MR)	3,76	3,2	0,113	1,93E-09	1,93
67	1	P	119	13.02.2011	Tank	Chelex	67	Ni 60(MR)	3,32	3,3	0,139	2,37E-09	2,37
68	1	D	112	13.02.2011	Tank	Chelex	68	Ni 60(MR)	3,86	4,6	0,172	2,94E-09	2,94
69	2	P	126	13.02.2011	Tank	Chelex	69	Ni 60(MR)	3,95	1,4	0,156	2,66E-09	2,66
70	2	D	117	13.02.2011	Tank	Chelex	70	Ni 60(MR)	3,13	4,2	0,134	2,28E-09	2,28
71	3	P	117	13.02.2011	Tank	Chelex	71	Ni 60(MR)	3,96	2,1	0,169	2,87E-09	2,87
72	3	D	121	13.02.2011	Tank	Chelex	72	Ni 60(MR)	1,93	2,3	0,079	1,35E-09	1,35
73	4	P	121	13.02.2011	Tank	Chelex	73	Ni 60(MR)	2,41	2,4	0,100	1,70E-09	1,70
74	4	D	121	13.02.2011	Tank	Chelex	74	Ni 60(MR)	2,00	4,0	0,083	1,41E-09	1,41
75	5	P	101	13.02.2011	Tank	Chelex	75	Ni 60(MR)	2,32	1,8	0,115	1,96E-09	1,96
76	5	D	108	13.02.2011	Tank	Chelex	76	Ni 60(MR)	2,55	1,6	0,118	2,01E-09	2,01
77	6	P	120	14.02.2011	Tank	Chelex	77	Ni 60(MR)	0,52	4,8	0,022	3,73E-10	0,37
78	6	D	107	14.02.2011	Tank	Chelex	78	Ni 60(MR)	3,87	4,0	0,182	3,10E-09	3,10
79	7	P	117	14.02.2011	Tank	Chelex	79	Ni 60(MR)	2,38	0,9	0,102	1,73E-09	1,73
80	7	D	95	14.02.2011	Tank	Chelex	80	Ni 60(MR)	2,63	3,3	0,139	2,37E-09	2,37
81	8	P	112	14.02.2011	Tank	Chelex	81	Ni 60(MR)	3,43	3,2	0,153	2,61E-09	2,61
82	8	D	112	14.02.2011	Tank	Chelex	82	Ni 60(MR)	3,16	1,3	0,141	2,40E-09	2,40
83	9	P	102	14.02.2011	Tank	Chelex	83	Ni 60(MR)	3,62	1,2	0,178	3,03E-09	3,03
84	9	D	120	14.02.2011	Tank	Chelex	84	Ni 60(MR)	2,04	2,6	0,085	1,45E-09	1,45
85	10	P	117	14.02.2011	Tank	Chelex	85	Ni 60(MR)	2,25	3,4	0,096	1,64E-09	1,64
86	10	D	116	14.02.2011	Tank	Chelex	86	Ni 60(MR)	2,33	4,9	0,101	1,71E-09	1,71
A	10	P	120		Depth Profile	Chelex	87	Ni 60(MR)	4,52	0,6	0,188	3,21E-09	3,21
B	10	D	120		Depth Profile	Chelex	88	Ni 60(MR)	5,01	0,7	0,209	3,55E-09	3,55

C	0	P	122		Depth Profile	Chelex	89	Ni 60(MR)	1,36	4,7	0,056	9,51E-10	0,95
D	0	D	115		Depth Profile	Chelex	90	Ni 60(MR)	1,34	3,9	0,058	9,93E-10	0,99
E	4	P	120		Depth Profile	Chelex	91	Ni 60(MR)	4,05	2,9	0,169	2,88E-09	2,88
F	4	D	126		Depth Profile	Chelex	92	Ni 60(MR)	4,42	2,7	0,175	2,99E-09	2,99
G	50	P	103		Depth Profile	Chelex	93	Ni 60(MR)	4,68	4,1	0,227	3,87E-09	3,87
H	50	D	125		Depth Profile	Chelex	94	Ni 60(MR)	6,03	2,5	0,241	4,11E-09	4,11
I	30	P	125		Depth Profile	Chelex	95	Ni 60(MR)	5,81	2,9	0,233	3,96E-09	3,96
J	30	D	120		Depth Profile	Chelex	96	Ni 60(MR)	6,28	2,2	0,262	4,46E-09	4,46
K	70	P	100		Depth Profile	Chelex	97	Ni 60(MR)	5,71	3,1	0,285	4,86E-09	4,86
L	70	D	120		Depth Profile	Chelex	98	Ni 60(MR)	5,40	5,2	0,225	3,84E-09	3,84
M	A	P	28		River	Chelex	99	Ni 60(MR)	1,88	5,3	0,336	5,72E-09	5,72
N	B	P	50		River	Chelex	100	Ni 60(MR)	1,42	7,0	0,142	2,43E-09	2,43
O	C	P	48		River	Chelex	101	Ni 60(MR)	1,59	3,3	0,165	2,81E-09	2,81
P	A	D	45		River	Chelex	102	Ni 60(MR)	2,20	1,6	0,244	4,16E-09	4,16
Q	B	D	45		River	Chelex	103	Ni 60(MR)	1,13	4,0	0,126	2,14E-09	2,14
R	C	D	45		River	Chelex	104	Ni 60(MR)	1,37	5,8	0,152	2,59E-09	2,59

Table C12: Results sheet DGT samples; nickel

										Concentration					
										Uncorrected		Corrected			
Smpl	Tank/Depth	Fract	Vol (mL)	Time (sec)	Date	Type of sample	Method	Project-Inr	Element	µg.L^{-1}	RSD %	µg.L^{-1}	M (ng) DGT	Mol.L^{-1}	nM
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	132	Ni 60(MR)	2,10	6,5	0,46	13,15	7,92E-09	7,92
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	133	Ni 60(MR)	2,13	5,2	0,47	13,34	8,03E-09	8,03
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	134	Ni 60(MR)	4,25	1,7	0,79	26,58	1,35E-08	13,47
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	135	Ni 60(MR)	1,93	0,5	0,36	12,04	6,10E-09	6,10
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	136	Ni 60(MR)	2,31	0,5	0,32	14,42	5,48E-09	5,48
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	137	Ni 60(MR)	1,65	5,0	0,23	10,31	3,92E-09	3,92
2	5	D	1700	214740	23.01.2011	Tank	DGT	138	Ni 60(MR)	1,46	4,1	0,32	9,10	5,48E-09	5,48
2	5	D	1700	214740	23.01.2011	Tank	DGT	139	Ni 60(MR)	1,42	3,1	0,31	8,85	5,33E-09	5,33
2	5	D	1700	255240	23.01.2011	Tank	DGT	140	Ni 60(MR)	2,76	1,5	0,51	17,25	8,74E-09	8,74
2	5	D	1700	255240	23.01.2011	Tank	DGT	141	Ni 60(MR)	3,05	4,0	0,57	19,07	9,66E-09	9,66

2	5	D	1700	340140	23.01.2011	Tank	DGT	142	Ni 60(MR)	2,34	1,1	0,33	14,65	5,57E-09	5,57
2	5	D	1700	340140	23.01.2011	Tank	DGT	143	Ni 60(MR)	2,38	4,7	0,33	14,88	5,66E-09	5,66
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	144	Ni 60(MR)	1,49	1,7	0,40	9,33	6,82E-09	6,82
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	145	Ni 60(MR)	1,38	7,0	0,37	8,61	6,29E-09	6,29
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	146	Ni 60(MR)	1,61	2,7	0,28	10,08	4,69E-09	4,69
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	147	Ni 60(MR)	1,89	2,4	0,32	11,83	5,51E-09	5,51
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	148	Ni 60(MR)	1,83	4,0	0,31	11,42	5,31E-09	5,31
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	149	Ni 60(MR)	1,66	2,4	0,28	10,37	4,83E-09	4,83
4	5	P	1360	176880	23.01.2011	Tank	DGT	150	Ni 60(MR)	6,64	3,4	1,78	41,47	3,03E-08	30,33
4	5	P	1360	176880	23.01.2011	Tank	DGT	151	Ni 60(MR)	7,18	2,5	1,93	44,90	3,28E-08	32,84
4	5	P	1360	277800	23.01.2011	Tank	DGT	152	Ni 60(MR)	7,69	2,2	1,31	48,03	2,24E-08	22,37
4	5	P	1360	277800	23.01.2011	Tank	DGT	153	Ni 60(MR)	6,81	4,6	1,16	42,54	1,98E-08	19,81
4	5	P	1360	277800	23.01.2011	Tank	DGT	154	Ni 60(MR)	7,49	5,1	1,28	46,81	2,18E-08	21,80
4	5	P	1360	277800	23.01.2011	Tank	DGT	155	Ni 60(MR)	7,25	2,3	1,24	45,34	2,11E-08	21,11
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	156	Ni 60(MR)	7,01	1,3	1,94	43,79	3,30E-08	32,96
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	157	Ni 60(MR)	7,89	3,0	2,18	49,30	3,71E-08	37,11
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	158	Ni 60(MR)	6,52	2,8	1,20	40,77	2,05E-08	20,50
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	159	Ni 60(MR)	6,58	2,0	1,21	41,14	2,07E-08	20,69
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	160	Ni 60(MR)	7,12	2,1	1,06	44,52	1,81E-08	18,14
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	161	Ni 60(MR)	10,15	3,8	1,52	63,45	2,59E-08	25,85
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	162	Ni 60(MR)	1,73	6,9	0,48	10,84	8,16E-09	8,16
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	163	Ni 60(MR)	1,57	4,5	0,43	9,80	7,38E-09	7,38
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	164	Ni 60(MR)	1,69	3,6	0,31	10,58	5,32E-09	5,32
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	165	Ni 60(MR)	1,23	8,4	0,23	7,70	3,87E-09	3,87
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	166	Ni 60(MR)	1,86	4,4	0,28	11,59	4,71E-09	4,71
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	167	Ni 60(MR)	1,42	4,3	0,21	8,88	3,61E-09	3,61
7	1	P	2360	250200	26.01.2011	Tank	DGT	168	Ni 60(MR)	3,00	1,1	0,57	18,74	9,69E-09	9,69
7	1	P	2360	250200	26.01.2011	Tank	DGT	169	Ni 60(MR)	2,62	1,5	0,50	16,40	8,48E-09	8,48
7	1	P	2360	250200	26.01.2011	Tank	DGT	170	Ni 60(MR)	5,22	3,3	0,99	32,65	1,69E-08	16,88
8	2	P	2050	250200	26.01.2011	Tank	DGT	171	Ni 60(MR)	1,61	2,7	0,31	10,07	5,21E-09	5,21
8	2	P	2050	250200	26.01.2011	Tank	DGT	172	Ni 60(MR)	4,25	6,2	0,81	26,58	1,37E-08	13,74
8	2	P	2050	250200	26.01.2011	Tank	DGT	173	Ni 60(MR)	1,37	4,5	0,26	8,57	4,43E-09	4,43
9	3	P	1345	250200	26.01.2011	Tank	DGT	174	Ni 60(MR)	2,10	2,2	0,40	13,12	6,78E-09	6,78
9	3	P	1345	250200	26.01.2011	Tank	DGT	175	Ni 60(MR)	0,94	5,8	0,18	5,86	3,03E-09	3,03

9	3	P	1345	250200	26.01.2011	Tank	DGT	176	Ni 60(MR)	1,91	2,1	0,36	11,92	6,16E-09	6,16
10	4	P	1460	250200	26.01.2011	Tank	DGT	177	Ni 60(MR)	1,41	5,6	0,27	8,83	4,57E-09	4,57
10	4	P	1460	250200	26.01.2011	Tank	DGT	178	Ni 60(MR)	1,22	3,0	0,23	7,64	3,95E-09	3,95
10	4	P	1460	250200	26.01.2011	Tank	DGT	179	Ni 60(MR)	1,12	4,0	0,21	6,99	3,61E-09	3,61
11	5	P	1470	250200	26.01.2011	Tank	DGT	180	Ni 60(MR)	1,95	3,9	0,37	12,17	6,29E-09	6,29
11	5	P	1470	250200	26.01.2011	Tank	DGT	181	Ni 60(MR)	1,36	1,4	0,26	8,47	4,38E-09	4,38
11	5	P	1470	250200	26.01.2011	Tank	DGT	182	Ni 60(MR)	1,39	4,3	0,26	8,70	4,50E-09	4,50
12	6	P	2000	252000	27.01.2011	Tank	DGT	183	Ni 60(MR)	0,98	4,6	0,19	6,15	3,16E-09	3,16
12	6	P	2000	252000	27.01.2011	Tank	DGT	184	Ni 60(MR)	1,02	3,9	0,19	6,35	3,26E-09	3,26
12	6	P	2000	252000	27.01.2011	Tank	DGT	185	Ni 60(MR)	1,11	5,3	0,21	6,92	3,55E-09	3,55
13	7	P	2000	252000	27.01.2011	Tank	DGT	186	Ni 60(MR)	1,11	3,5	0,21	6,97	3,58E-09	3,58
13	7	P	2000	252000	27.01.2011	Tank	DGT	187	Ni 60(MR)	1,19	0,9	0,22	7,46	3,83E-09	3,83
13	7	P	2000	252000	27.01.2011	Tank	DGT	188	Ni 60(MR)	0,99	7,4	0,19	6,20	3,18E-09	3,18
14	8	P	1500	252000	27.01.2011	Tank	DGT	189	Ni 60(MR)	1,29	8,8	0,24	8,08	4,15E-09	4,15
14	8	P	1500	252000	27.01.2011	Tank	DGT	190	Ni 60(MR)	5,21	1,7	0,98	32,58	1,67E-08	16,72
14	8	P	1500	252000	27.01.2011	Tank	DGT	191	Ni 60(MR)	1,29	2,0	0,24	8,04	4,13E-09	4,13
15	9	P	1500	252000	27.01.2011	Tank	DGT	192	Ni 60(MR)	1,18	2,6	0,22	7,36	3,78E-09	3,78
15	9	P	1500	252000	27.01.2011	Tank	DGT	193	Ni 60(MR)	1,18	2,4	0,22	7,37	3,78E-09	3,78
15	9	P	1500	252000	27.01.2011	Tank	DGT	194	Ni 60(MR)	1,22	4,7	0,23	7,61	3,91E-09	3,91
16	10	P	2000	283800	27.01.2011	Tank	DGT	195	Ni 60(MR)	1,28	2,3	0,21	8,00	3,64E-09	3,64
16	10	P	2000	283800	27.01.2011	Tank	DGT	196	Ni 60(MR)	1,35	2,1	0,23	8,45	3,85E-09	3,85
16	10	P	2000	283800	27.01.2011	Tank	DGT	197	Ni 60(MR)	1,32	1,2	0,22	8,23	3,75E-09	3,75
17	4	P	2000	405120	29.01.2011	Tank	DGT	198	Ni 60(MR)	1,45	7,7	0,17	9,03	2,88E-09	2,88
17	4	P	2000	405120	29.01.2011	Tank	DGT	199	Ni 60(MR)	1,27	5,5	0,15	7,92	2,53E-09	2,53
18	5	P	2000	405120	29.01.2011	Tank	DGT	200	Ni 60(MR)	3,43	1,1	0,40	21,43	6,84E-09	6,84
18	5	P	2000	405120	29.01.2011	Tank	DGT	201	Ni 60(MR)	1,20	3,8	0,14	7,47	2,39E-09	2,39
19	9	P	1500	313140	30.01.2011	Tank	DGT	202	Ni 60(MR)	0,90	4,2	0,14	5,65	2,33E-09	2,33
19	9	P	1500	313140	30.01.2011	Tank	DGT	203	Ni 60(MR)	1,99	7,4	0,30	12,46	5,15E-09	5,15
20	10	P	1500	312900	30.01.2011	Tank	DGT	204	Ni 60(MR)	0,55	7,3	0,08	3,42	1,42E-09	1,42
20	10	P	1500	312900	30.01.2011	Tank	DGT	205	Ni 60(MR)	4,82	0,9	0,73	30,11	1,24E-08	12,45
21	1	P	2000	253200	04.02.2011	Tank	DGT	206	Ni 60(MR)	1,27	3,2	0,24	7,94	4,06E-09	4,06
21	1	P	2000	253200	04.02.2011	Tank	DGT	207	Ni 60(MR)	1,02	1,7	0,19	6,39	3,26E-09	3,26
21	1	P	2000	253200	04.02.2011	Tank	DGT	208	Ni 60(MR)	1,39	6,9	0,26	8,70	4,44E-09	4,44
22	2	P	2000	252600	04.02.2011	Tank	DGT	209	Ni 60(MR)	1,05	4,4	0,20	6,56	3,36E-09	3,36

22	2	P	2000	252600	04.02.2011	Tank	DGT	210	Ni 60(MR)	1,18	4,1	0,22	7,40	3,79E-09	3,79
22	2	P	2000	252600	04.02.2011	Tank	DGT	211	Ni 60(MR)	0,90	7,3	0,17	5,64	2,89E-09	2,89
23	3	P	2000	252420	04.02.2011	Tank	DGT	212	Ni 60(MR)	2,05	5,3	0,39	12,84	6,58E-09	6,58
23	3	P	2000	252420	04.02.2011	Tank	DGT	213	Ni 60(MR)	2,06	0,6	0,39	12,87	6,60E-09	6,60
23	3	P	2000	252420	04.02.2011	Tank	DGT	214	Ni 60(MR)	1,48	0,8	0,28	9,25	4,74E-09	4,74
24	4	P	1500	252180	04.02.2011	Tank	DGT	215	Ni 60(MR)	2,45	0,8	0,46	15,33	7,87E-09	7,87
24	4	P	1500	252180	04.02.2011	Tank	DGT	216	Ni 60(MR)	2,12	2,4	0,40	13,26	6,80E-09	6,80
24	4	P	1500	252180	04.02.2011	Tank	DGT	217	Ni 60(MR)	2,88	2,1	0,54	18,00	9,23E-09	9,23
25	5	P	1500	252000	04.02.2011	Tank	DGT	218	Ni 60(MR)	1,41	2,8	0,27	8,84	4,54E-09	4,54
25	5	P	1500	252000	04.02.2011	Tank	DGT	219	Ni 60(MR)	1,81	2,6	0,34	11,29	5,79E-09	5,79
25	5	P	1500	252000	04.02.2011	Tank	DGT	220	Ni 60(MR)	1,48	2,2	0,28	9,24	4,74E-09	4,74
26	6	P	1500	426300	05.02.2011	Tank	DGT	221	Ni 60(MR)	2,37	2,4	0,26	14,81	4,49E-09	4,49
26	6	P	1500	426300	05.02.2011	Tank	DGT	222	Ni 60(MR)	3,52	3,4	0,39	21,98	6,67E-09	6,67
26	6	P	1500	426300	05.02.2011	Tank	DGT	223	Ni 60(MR)	3,26	1,3	0,36	20,38	6,18E-09	6,18
27	7	P	1500	426300	05.02.2011	Tank	DGT	224	Ni 60(MR)	2,86	0,7	0,32	17,89	5,43E-09	5,43
27	7	P	1500	426300	05.02.2011	Tank	DGT	225	Ni 60(MR)	2,85	3,5	0,32	17,83	5,41E-09	5,41
27	7	P	1500	426300	05.02.2011	Tank	DGT	226	Ni 60(MR)	3,12	3,5	0,35	19,48	5,91E-09	5,91
28	8	P	1500	426300	05.02.2011	Tank	DGT	227	Ni 60(MR)	3,00	3,7	0,33	18,73	5,68E-09	5,68
28	8	P	1500	426300	05.02.2011	Tank	DGT	228	Ni 60(MR)	2,81	1,7	0,31	17,59	5,34E-09	5,34
28	8	P	1500	426300	05.02.2011	Tank	DGT	229	Ni 60(MR)	2,60	4,5	0,29	16,28	4,94E-09	4,94
29	9	P	1500	426300	05.02.2011	Tank	DGT	230	Ni 60(MR)	2,22	1,7	0,25	13,89	4,22E-09	4,22
29	9	P	1500	426300	05.02.2011	Tank	DGT	231	Ni 60(MR)	2,44	1,8	0,27	15,27	4,63E-09	4,63
29	9	P	1500	426300	05.02.2011	Tank	DGT	232	Ni 60(MR)	2,52	1,1	0,28	15,75	4,78E-09	4,78
30	10	P	1500	426300	05.02.2011	Tank	DGT	233	Ni 60(MR)	2,29	4,0	0,25	14,29	4,34E-09	4,34
30	10	P	1500	426300	05.02.2011	Tank	DGT	234	Ni 60(MR)	2,16	3,8	0,24	13,51	4,10E-09	4,10
30	10	P	1500	426300	05.02.2011	Tank	DGT	235	Ni 60(MR)	2,19	1,9	0,24	13,70	4,16E-09	4,16
31	1	P	1500	259860	13.02.2011	Tank	DGT	236	Ni 60(MR)	2,41	3,1	0,44	15,08	7,50E-09	7,50
31	1	P	1500	259860	13.02.2011	Tank	DGT	237	Ni 60(MR)	2,51	2,8	0,46	15,70	7,81E-09	7,81
31	1	P	1500	259860	13.02.2011	Tank	DGT	238	Ni 60(MR)	2,57	4,4	0,47	16,08	8,00E-09	8,00
32	2	P	1500	259860	13.02.2011	Tank	DGT	239	Ni 60(MR)	2,40	3,5	0,44	15,01	7,47E-09	7,47
32	2	P	1500	259860	13.02.2011	Tank	DGT	240	Ni 60(MR)	2,34	5,0	0,43	14,64	7,29E-09	7,29
32	2	P	1500	259860	13.02.2011	Tank	DGT	241	Ni 60(MR)	2,47	7,8	0,45	15,46	7,70E-09	7,70
33	3	P	2000	259860	13.02.2011	Tank	DGT	242	Ni 60(MR)	2,20	6,4	0,40	13,74	6,84E-09	6,84
33	3	P	2000	259860	13.02.2011	Tank	DGT	243	Ni 60(MR)	2,24	0,7	0,41	13,97	6,95E-09	6,95

33	3	P	2000	259860	13.02.2011	Tank	DGT	244	Ni 60(MR)	2,20	5,6	0,40	13,77	6,86E-09	6,86
34	4	P	2000	259860	13.02.2011	Tank	DGT	245	Ni 60(MR)	2,39	3,1	0,44	14,97	7,45E-09	7,45
34	4	P	2000	259860	13.02.2011	Tank	DGT	246	Ni 60(MR)	2,02	3,0	0,37	12,63	6,29E-09	6,29
34	4	P	2000	259860	13.02.2011	Tank	DGT	247	Ni 60(MR)	2,08	6,1	0,38	13,01	6,48E-09	6,48
35	5	P	2000	259860	13.02.2011	Tank	DGT	248	Ni 60(MR)	2,08	2,6	0,38	13,03	6,49E-09	6,49
35	5	P	2000	259860	13.02.2011	Tank	DGT	249	Ni 60(MR)	2,05	0,9	0,38	12,84	6,39E-09	6,39
35	5	P	2000	259860	13.02.2011	Tank	DGT	250	Ni 60(MR)	2,03	3,5	0,37	12,69	6,32E-09	6,32
36	6	P	1500	256560	14.02.2011	Tank	DGT	251	Ni 60(MR)	2,46	1,4	0,45	15,35	7,74E-09	7,74
36	6	P	1500	256560	14.02.2011	Tank	DGT	252	Ni 60(MR)	2,94	5,2	0,54	18,39	9,27E-09	9,27
36	6	P	1500	256560	14.02.2011	Tank	DGT	253	Ni 60(MR)	2,51	6,3	0,46	15,69	7,91E-09	7,91
37	7	P	1500	256560	14.02.2011	Tank	DGT	254	Ni 60(MR)	2,61	2,7	0,48	16,32	8,23E-09	8,23
37	7	P	1500	256560	14.02.2011	Tank	DGT	255	Ni 60(MR)	2,88	6,8	0,53	18,02	9,09E-09	9,09
37	7	P	1500	256560	14.02.2011	Tank	DGT	256	Ni 60(MR)	2,73	3,2	0,51	17,09	8,61E-09	8,61
38	8	P	1500	256560	14.02.2011	Tank	DGT	257	Ni 60(MR)	2,61	2,7	0,48	16,31	8,22E-09	8,22
38	8	P	1500	256560	14.02.2011	Tank	DGT	258	Ni 60(MR)	2,17	3,7	0,40	13,55	6,83E-09	6,83
38	8	P	1500	256560	14.02.2011	Tank	DGT	259	Ni 60(MR)	1,61	7,5	0,30	10,09	5,09E-09	5,09
39	9	P	2000	255060	14.02.2011	Tank	DGT	260	Ni 60(MR)	1,70	8,5	0,32	10,65	5,40E-09	5,40
39	9	P	2000	255060	14.02.2011	Tank	DGT	261	Ni 60(MR)	1,66	2,1	0,31	10,39	5,27E-09	5,27
39	9	P	2000	255060	14.02.2011	Tank	DGT	262	Ni 60(MR)	1,57	1,0	0,29	9,79	4,96E-09	4,96
40	10	P	2000	255060	14.02.2011	Tank	DGT	263	Ni 60(MR)	1,54	1,8	0,29	9,62	4,88E-09	4,88
40	10	P	2000	255060	14.02.2011	Tank	DGT	264	Ni 60(MR)	1,38	2,7	0,26	8,62	4,37E-09	4,37
40	10	P	2000	255060	14.02.2011	Tank	DGT	265	Ni 60(MR)	1,41	5,3	0,26	8,79	4,46E-09	4,46
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	266	Ni 60(MR)	1,66	3,6	0,24	10,40	4,02E-09	4,02
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	267	Ni 60(MR)	1,74	1,6	0,25	10,85	4,19E-09	4,19
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	268	Ni 60(MR)	1,60	10,1	0,23	10,03	3,87E-09	3,87
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	269	Ni 60(MR)	2,31	1,5	0,33	14,46	5,59E-09	5,59
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	270	Ni 60(MR)	2,44	5,7	0,35	15,28	5,90E-09	5,90
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	271	Ni 60(MR)	2,21	2,4	0,31	13,78	5,32E-09	5,32
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	272	Ni 60(MR)	2,58	3,4	0,36	16,12	6,13E-09	6,13
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	273	Ni 60(MR)	2,68	0,7	0,37	16,76	6,37E-09	6,37
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	274	Ni 60(MR)	2,73	1,8	0,38	17,03	6,48E-09	6,48
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	275	Ni 60(MR)	2,81	4,8	0,39	17,56	6,68E-09	6,68
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	276	Ni 60(MR)	4,32	1,1	0,60	27,02	1,03E-08	10,27
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	277	Ni 60(MR)	4,28	4,6	0,60	26,73	1,02E-08	10,16

70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	278	Ni 60(MR)	4,16	1,7	0,58	26,01	9,89E-09	9,89
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	279	Ni 60(MR)	3,93	3,5	0,55	24,55	9,34E-09	9,34
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	280	Ni 60(MR)	4,06	1,6	0,57	25,36	9,64E-09	9,64
A			920	329400	09.02.2011	River	DGT	281	Ni 60(MR)	3,20	3,1	0,46	20,03	7,86E-09	7,86
A			920	329400	09.02.2011	River	DGT	282	Ni 60(MR)	3,17	7,0	0,46	19,80	7,77E-09	7,77
A			920	329400	09.02.2011	River	DGT	283	Ni 60(MR)	3,07	2,1	0,44	19,18	7,53E-09	7,53
B			750	325800	09.02.2011	River	DGT	284	Ni 60(MR)	10,12	3,4	1,47	63,25	2,51E-08	25,11
B			750	325800	09.02.2011	River	DGT	285	Ni 60(MR)	10,39	2,4	1,51	64,95	2,58E-08	25,79
B			750	325800	09.02.2011	River	DGT	286	Ni 60(MR)	9,56	2,6	1,39	59,75	2,37E-08	23,72

Table C13: Results sheet Total filtration samples; nickel

									Concentration				
									Uncorrected		Corrected		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**$\mu g.L^{-1}$**	**RSD %**	**$\mu g.L^{-1}$**	**$Mol.L^{-1}$**	**nM**
4	1	0,2	800	26.01.2011	Filtration	UC-Digest	317	Ni 60(MR)	0,21	3,9	0,0155	2,64E-10	0,264
5	2	0,2	800	26.01.2011	Filtration	UC-Digest	318	Ni 60(MR)	0,25	14,6	0,0191	3,26E-10	0,326
6	3	0,2	600	26.01.2011	Filtration	UC-Digest	319	Ni 60(MR)	0,33	3,7	0,0329	5,61E-10	0,561
7	4	0,2	600	26.01.2011	Filtration	UC-Digest	320	Ni 60(MR)	0,35	8,0	0,0348	5,93E-10	0,593
8	5	0,2	600	26.01.2011	Filtration	UC-Digest	321	Ni 60(MR)	0,19	10,6	0,0194	3,30E-10	0,330
9	6	0,2	600	27.01.2011	Filtration	UC-Digest	322	Ni 60(MR)	0,13	11,7	0,0132	2,25E-10	0,225
10	7	0,2	600	27.01.2011	Filtration	UC-Digest	323	Ni 60(MR)	0,12	7,5	0,0116	1,98E-10	0,198
11	8	0,2	600	27.01.2011	Filtration	UC-Digest	324	Ni 60(MR)	0,16	4,1	0,0160	2,73E-10	0,273
12	9	0,2	600	27.01.2011	Filtration	UC-Digest	325	Ni 60(MR)	0,12	1,1	0,0126	2,15E-10	0,215
13	10	0,2	600	27.01.2011	Filtration	UC-Digest	326	Ni 60(MR)	0,13	16,8	0,0130	2,22E-10	0,222
63	1	0,2	600	01.02.2011	Filtration	UC-Digest	376	Ni 60(MR)	-	-	-	-	-
64	2	0,2	600	01.02.2011	Filtration	UC-Digest	377	Ni 60(MR)	0,12	1,3	0,0120	2,04E-10	0,204
65	3	0,2	600	01.02.2011	Filtration	UC-Digest	378	Ni 60(MR)	0,21	1,0	0,0214	3,65E-10	0,365
66	4	0,2	600	01.02.2011	Filtration	UC-Digest	379	Ni 60(MR)	0,44	8,8	0,0443	7,55E-10	0,755
67	5	0,2	400	01.02.2011	Filtration	UC-Digest	517	Ni 60(MR)	0,23	9,8	0,0341	5,80E-10	0,580

68	6	0,2	600	02.02.2011	Filtration	UC-Digest	381	Ni 60(MR)	0,10	13,8	0,0101	1,72E-10	0,172
69	7	0,2	600	02.02.2011	Filtration	UC-Digest	382	Ni 60(MR)	0,24	2,2	0,0239	4,07E-10	0,407
70	8	0,2	600	02.02.2011	Filtration	UC-Digest	383	Ni 60(MR)	0,15	10,6	0,0146	2,48E-10	0,248
71	9	0,2	400	02.02.2011	Filtration	UC-Digest	384	Ni 60(MR)	0,19	4,6	0,0282	4,80E-10	0,480
72	10	0,2	400	02.02.2011	Filtration	UC-Digest	385	Ni 60(MR)	0,19	4,4	0,0280	4,77E-10	0,477
123	1	0,2	500	07.02.2011	Filtration	UC-Digest	436	Ni 60(MR)	0,12	3,9	0,0143	2,43E-10	0,243
124	2	0,2	500	07.02.2011	Filtration	UC-Digest	437	Ni 60(MR)	0,09	4,1	0,0103	1,76E-10	0,176
125	3	0,2	200	07.02.2011	Filtration	UC-Digest	438	Ni 60(MR)	0,20	17,0	0,0587	1,00E-09	1,000
126	4	0,2	200	07.02.2011	Filtration	UC-Digest	439	Ni 60(MR)	0,23	2,1	0,0681	1,16E-09	1,160
127	5	0,2	200	07.02.2011	Filtration	UC-Digest	440	Ni 60(MR)	0,13	4,1	0,0380	6,47E-10	0,647
128	6	0,2	500	08.02.2011	Filtration	UC-Digest	441	Ni 60(MR)	0,11	6,0	0,0127	2,16E-10	0,216
129	7	0,2	500	08.02.2011	Filtration	UC-Digest	442	Ni 60(MR)	0,11	2,2	0,0132	2,24E-10	0,224
130	8	0,2	300	08.02.2011	Filtration	UC-Digest	443	Ni 60(MR)	0,10	8,7	0,0190	3,24E-10	0,324
131	9	0,2	200	08.02.2011	Filtration	UC-Digest	444	Ni 60(MR)	0,13	6,9	0,0397	6,77E-10	0,677
132	10	0,2	200	08.02.2011	Filtration	UC-Digest	445	Ni 60(MR)	0,12	12,1	0,0348	5,93E-10	0,593
133	1	0,2	500	10.02.2011	Filtration	UC-Digest	446	Ni 60(MR)	0,07	3,6	0,0088	1,50E-10	0,150
134	2	0,2	500	10.02.2011	Filtration	UC-Digest	447	Ni 60(MR)	0,11	7,1	0,0127	2,17E-10	0,217
135	3	0,2	200	10.02.2011	Filtration	UC-Digest	448	Ni 60(MR)	0,10	14,9	0,0305	5,19E-10	0,519
136	4	0,2	200	10.02.2011	Filtration	UC-Digest	449	Ni 60(MR)	0,21	1,9	0,0617	1,05E-09	1,051
137	5	0,2	200	10.02.2011	Filtration	UC-Digest	450	Ni 60(MR)	0,08	8,4	0,0228	3,88E-10	0,388
138	6	0,2	500	11.02.2011	Filtration	UC-Digest	451	Ni 60(MR)	0,01	7,4	0,0018	3,00E-11	0,030
139	7	0,2	500	11.02.2011	Filtration	UC-Digest	452	Ni 60(MR)	0,07	5,9	0,0080	1,36E-10	0,136
140	8	0,2	200	11.02.2011	Filtration	UC-Digest	453	Ni 60(MR)	0,11	0,9	0,0329	5,60E-10	0,560
141	9	0,2	200	11.02.2011	Filtration	UC-Digest	454	Ni 60(MR)	0,13	3,2	0,0402	6,85E-10	0,685
142	10	0,2	200	11.02.2011	Filtration	UC-Digest	455	Ni 60(MR)	0,13	3,3	0,0377	6,42E-10	0,642

Table C14: Results sheet size fractionation; nickel

									Concentration				
									Uncorrected		Corrected		
Smpl	Tank/Depth	Fract	Vol (mL)	Date	Type of sample	Method	Project-Inr	Element	µg.L^{-1}	RSD %	µg.L^{-1}	Mol.L^{-1}	nM
13	1	140	-	29.01.2011	Filtration	UC-Digest	326	Ni 60(MR)	-	-	-	-	-
14	1	20	1960	29.01.2011	Filtration	UC-Digest	327	Ni 60(MR)	0,224	5,3	0,0069	1,17E-10	0,117
15	1	10	600	29.01.2011	Filtration	UC-Digest	328	Ni 60(MR)	0,121	8,9	0,0121	2,06E-10	0,206
16	1	2	600	29.01.2011	Filtration	UC-Digest	329	Ni 60(MR)	0,132	16,9	0,0132	2,25E-10	0,225
17	1	0,2	450	29.01.2011	Filtration	UC-Digest	330	Ni 60(MR)	0,123	5,9	0,0164	2,79E-10	0,279
18	2	140	2100	29.01.2011	Filtration	UC-Digest	331	Ni 60(MR)	0,235	5,6	0,0067	1,14E-10	0,114
19	2	20	2100	29.01.2011	Filtration	UC-Digest	332	Ni 60(MR)	0,171	7,6	0,0049	8,32E-11	0,083
20	2	10	600	29.01.2011	Filtration	UC-Digest	333	Ni 60(MR)	0,044	14,5	0,0044	7,44E-11	0,074
21	2	2	550	29.01.2011	Filtration	UC-Digest	334	Ni 60(MR)	0,081	8,9	0,0088	1,50E-10	0,150
22	2	0,2	500	29.01.2011	Filtration	UC-Digest	335	Ni 60(MR)	0,185	9,8	0,0222	3,78E-10	0,378
23	3	140	2000	29.01.2011	Filtration	UC-Digest	336	Ni 60(MR)	0,095	11,6	0,0028	4,85E-11	0,049
24	3	20	-	29.01.2011	Filtration	UC-Digest	337	Ni 60(MR)	-	-	-	-	-
25	3	10	600	29.01.2011	Filtration	UC-Digest	338	Ni 60(MR)	0,038	10,0	0,0038	6,42E-11	0,064
26	3	2	600	29.01.2011	Filtration	UC-Digest	339	Ni 60(MR)	-	-	-	-	-
27	3	0,2	450	29.01.2011	Filtration	UC-Digest	340	Ni 60(MR)	0,118	15,1	0,0158	2,68E-10	0,268
28	4	140	2000	29.01.2011	Filtration	UC-Digest	341	Ni 60(MR)	0,184	5,2	0,0055	9,38E-11	0,094
29	4	20	2000	29.01.2011	Filtration	UC-Digest	342	Ni 60(MR)	0,213	13,9	0,0064	1,09E-10	0,109
30	4	10	600	29.01.2011	Filtration	UC-Digest	343	Ni 60(MR)	0,038	15,5	0,0038	6,42E-11	0,064
31	4	2	600	29.01.2011	Filtration	UC-Digest	344	Ni 60(MR)	0,085	9,9	0,0085	1,45E-10	0,145
32	4	0,2	450	29.01.2011	Filtration	UC-Digest	345	Ni 60(MR)	0,155	2,9	0,0207	3,53E-10	0,353
33	5	140	2000	29.01.2011	Filtration	UC-Digest	346	Ni 60(MR)	0,317	16,3	0,0095	1,62E-10	0,162
34	5	20	2000	29.01.2011	Filtration	UC-Digest	347	Ni 60(MR)	0,398	18,4	0,0119	2,03E-10	0,203
35	5	10	600	29.01.2011	Filtration	UC-Digest	348	Ni 60(MR)	0,300	13,0	0,0300	5,11E-10	0,511
36	5	2	600	29.01.2011	Filtration	UC-Digest	349	Ni 60(MR)	0,189	4,4	0,0189	3,22E-10	0,322
37	5	0,2	450	29.01.2011	Filtration	UC-Digest	350	Ni 60(MR)	0,271	12,9	0,0361	6,16E-10	0,616
38	6	140	2000	30.01.2011	Filtration	UC-Digest	351	Ni 60(MR)	0,118	7,2	0,0035	6,03E-11	0,060
39	6	20	2000	30.01.2011	Filtration	UC-Digest	352	Ni 60(MR)	0,343	12,6	0,0103	1,75E-10	0,175
40	6	10	550	30.01.2011	Filtration	UC-Digest	353	Ni 60(MR)	0,155	8,0	0,0169	2,87E-10	0,287

41	6	2	550	30.01.2011	Filtration	UC-Digest	354	Ni 60(MR)	0,014	17,4	0,0015	2,53E-11	0,025
42	6	0,2	450	30.01.2011	Filtration	UC-Digest	355	Ni 60(MR)	0,453	16,4	0,0604	1,03E-09	1,029
43	7	140	2000	30.01.2011	Filtration	UC-Digest	356	Ni 60(MR)	0,360	8,9	0,0108	1,84E-10	0,184
44	7	20	2000	30.01.2011	Filtration	UC-Digest	357	Ni 60(MR)	0,513	13,8	0,0154	2,62E-10	0,262
45	7	10	350	30.01.2011	Filtration	UC-Digest	358	Ni 60(MR)	0,194	10,8	0,0333	5,67E-10	0,567
46	7	2	350	30.01.2011	Filtration	UC-Digest	359	Ni 60(MR)	0,092	4,3	0,0158	2,69E-10	0,269
47	7	0,2	350	30.01.2011	Filtration	UC-Digest	360	Ni 60(MR)	0,182	5,5	0,0312	5,31E-10	0,531
48	8	140	2000	30.01.2011	Filtration	UC-Digest	361	Ni 60(MR)	0,378	4,5	0,0113	1,93E-10	0,193
49	8	20	2000	30.01.2011	Filtration	UC-Digest	362	Ni 60(MR)	0,447	5,0	0,0134	2,28E-10	0,228
50	8	10	600	30.01.2011	Filtration	UC-Digest	363	Ni 60(MR)	0,158	5,8	0,0160	2,72E-10	0,272
51	8	2	400	30.01.2011	Filtration	UC-Digest	364	Ni 60(MR)	0,136	4,0	0,0204	3,47E-10	0,347
52	8	0,2	400	30.01.2011	Filtration	UC-Digest	516	Ni 60(MR)	0,211	3,3	0,0317	5,40E-10	0,540
53	9	140	2000	30.01.2011	Filtration	UC-Digest	366	Ni 60(MR)	0,196	4,3	0,0059	1,00E-10	0,100
54	9	20	2000	30.01.2011	Filtration	UC-Digest	367	Ni 60(MR)	0,215	7,0	0,0064	1,10E-10	0,110
55	9	10	600	30.01.2011	Filtration	UC-Digest	368	Ni 60(MR)	0,100	7,8	0,0100	1,70E-10	0,170
56	9	2	400	30.01.2011	Filtration	UC-Digest	369	Ni 60(MR)	0,156	10,6	0,0234	3,99E-10	0,399
57	9	0,2	400	30.01.2011	Filtration	UC-Digest	370	Ni 60(MR)	0,270	0,5	0,0406	6,91E-10	0,691
58	10	140	2000	30.01.2011	Filtration	UC-Digest	371	Ni 60(MR)	109,754	1,1	3,2926	5,61E-08	56,083
59	10	20	2000	30.01.2011	Filtration	UC-Digest	372	Ni 60(MR)	0,267	4,3	0,0080	1,37E-10	0,137
60	10	10	600	30.01.2011	Filtration	UC-Digest	373	Ni 60(MR)	0,109	5,0	0,0110	1,88E-10	0,188
61	10	2	375	30.01.2011	Filtration	UC-Digest	374	Ni 60(MR)	0,104	13,0	0,0167	2,84E-10	0,284
62	10	0,2	375	30.01.2011	Filtration	UC-Digest	375	Ni 60(MR)	0,097	12,9	0,0156	2,65E-10	0,265
73	1	140	2000	04.02.2011	Filtration	UC-Digest	386	Ni 60(MR)	0,080	5,5	0,0024	4,06E-11	0,041
74	1	20	2000	04.02.2011	Filtration	UC-Digest	387	Ni 60(MR)	0,129	1,5	0,0039	6,57E-11	0,066
75	1	10	600	04.02.2011	Filtration	UC-Digest	388	Ni 60(MR)	-0,002	7,1	-0,0002	-3,96E-12	-0,004
76	1	2	600	04.02.2011	Filtration	UC-Digest	389	Ni 60(MR)	0,114	5,8	0,0114	1,95E-10	0,195
77	1	0,2	600	04.02.2011	Filtration	UC-Digest	390	Ni 60(MR)	0,165	9,7	0,0165	2,82E-10	0,282
78	2	140	2000	04.02.2011	Filtration	UC-Digest	391	Ni 60(MR)	0,109	11,4	0,0033	5,54E-11	0,055
79	2	20	2000	04.02.2011	Filtration	UC-Digest	392	Ni 60(MR)	0,270	6,1	0,0081	1,38E-10	0,138
80	2	10	600	04.02.2011	Filtration	UC-Digest	393	Ni 60(MR)	0,250	6,0	0,0250	4,26E-10	0,426
81	2	2	550	04.02.2011	Filtration	UC-Digest	394	Ni 60(MR)	0,075	6,8	0,0081	1,38E-10	0,138
82	2	0,2	500	04.02.2011	Filtration	UC-Digest	395	Ni 60(MR)	0,022	3,5	0,0026	4,47E-11	0,045
83	3	140	2000	04.02.2011	Filtration	UC-Digest	396	Ni 60(MR)	0,143	5,0	0,0043	7,31E-11	0,073
84	3	20	2000	04.02.2011	Filtration	UC-Digest	397	Ni 60(MR)	0,397	3,7	0,0119	2,03E-10	0,203

85	3	10	2000	04.02.2011	Filtration	UC-Digest	398	Ni 60(MR)	0,095	6,6	0,0029	4,87E-11	0,049
86	3	2	300	04.02.2011	Filtration	UC-Digest	399	Ni 60(MR)	0,039	6,2	0,0078	1,32E-10	0,132
87	3	0,2	300	04.02.2011	Filtration	UC-Digest	400	Ni 60(MR)	0,004	5,6	0,0008	1,44E-11	0,014
88	4	140	2000	04.02.2011	Filtration	UC-Digest	401	Ni 60(MR)	1,381	2,5	0,0414	7,06E-10	0,706
89	4	20	1000	04.02.2011	Filtration	UC-Digest	402	Ni 60(MR)	2,018	0,6	0,1211	2,06E-09	2,062
90	4	10	350	04.02.2011	Filtration	UC-Digest	403	Ni 60(MR)	0,696	3,4	0,1192	2,03E-09	2,031
91	4	2	300	04.02.2011	Filtration	UC-Digest	404	Ni 60(MR)	0,192	5,9	0,0383	6,52E-10	0,652
92	4	0,2	300	04.02.2011	Filtration	UC-Digest	405	Ni 60(MR)	1,053	1,2	0,2107	3,59E-09	3,588
93	5	140	1000	04.02.2011	Filtration	UC-Digest	406	Ni 60(MR)	0,972	2,4	0,0583	9,94E-10	0,994
94	5	20	1000	04.02.2011	Filtration	UC-Digest	407	Ni 60(MR)	0,969	7,3	0,0581	9,90E-10	0,990
95	5	10	250	04.02.2011	Filtration	UC-Digest	408	Ni 60(MR)	0,615	1,9	0,1477	2,51E-09	2,515
96	5	2	200	04.02.2011	Filtration	UC-Digest	409	Ni 60(MR)	1,035	5,3	0,3105	5,29E-09	5,289
97	5	0,2	200	04.02.2011	Filtration	UC-Digest	410	Ni 60(MR)	0,351	4,0	0,1054	1,80E-09	1,796
98	6	140	2000	05.02.2011	Filtration	UC-Digest	411	Ni 60(MR)	0,081	6,0	0,0024	4,14E-11	0,041
99	6	20	2000	05.02.2011	Filtration	UC-Digest	412	Ni 60(MR)	0,206	1,8	0,0062	1,05E-10	0,105
100	6	10	600	05.02.2011	Filtration	UC-Digest	413	Ni 60(MR)	-0,049	50,0	-0,0049	-8,32E-11	-0,083
101	6	2	400	05.02.2011	Filtration	UC-Digest	414	Ni 60(MR)	0,102	13,5	0,0153	2,60E-10	0,260
102	6	0,2	200	05.02.2011	Filtration	UC-Digest	415	Ni 60(MR)	0,133	5,1	0,0399	6,80E-10	0,680
103	7	140	2000	05.02.2011	Filtration	UC-Digest	416	Ni 60(MR)	0,267	7,6	0,0080	1,37E-10	0,137
104	7	20	1000	05.02.2011	Filtration	UC-Digest	417	Ni 60(MR)	0,109	6,0	0,0066	1,12E-10	0,112
105	7	10	400	05.02.2011	Filtration	UC-Digest	418	Ni 60(MR)	0,057	6,1	0,0087	1,49E-10	0,149
106	7	2	300	05.02.2011	Filtration	UC-Digest	419	Ni 60(MR)	0,106	3,8	0,0212	3,62E-10	0,362
107	7	0,2	200	05.02.2011	Filtration	UC-Digest	420	Ni 60(MR)	0,176	2,9	0,0527	8,97E-10	0,897
108	8	140	2000	05.02.2011	Filtration	UC-Digest	421	Ni 60(MR)	0,283	4,9	0,0085	1,45E-10	0,145
109	8	20	1000	05.02.2011	Filtration	UC-Digest	422	Ni 60(MR)	0,395	1,5	0,0237	4,03E-10	0,403
110	8	10	350	05.02.2011	Filtration	UC-Digest	423	Ni 60(MR)	0,305	4,0	0,0523	8,90E-10	0,890
111	8	2	200	05.02.2011	Filtration	UC-Digest	424	Ni 60(MR)	0,122	12,0	0,0366	6,23E-10	0,623
112	8	0,2	200	05.02.2011	Filtration	UC-Digest	425	Ni 60(MR)	0,099	4,2	0,0297	5,06E-10	0,506
113	9	140	2000	05.02.2011	Filtration	UC-Digest	426	Ni 60(MR)	0,657	3,4	0,0197	3,36E-10	0,336
114	9	20	1000	05.02.2011	Filtration	UC-Digest	427	Ni 60(MR)	0,336	6,5	0,0202	3,43E-10	0,343
115	9	10	350	05.02.2011	Filtration	UC-Digest	428	Ni 60(MR)	0,037	7,7	0,0063	1,07E-10	0,107
116	9	2	200	05.02.2011	Filtration	UC-Digest	429	Ni 60(MR)	0,014	6,2	0,0043	7,40E-11	0,074
117	9	0,2	200	05.02.2011	Filtration	UC-Digest	430	Ni 60(MR)	0,033	3,1	0,0098	1,67E-10	0,167
118	10	140	1000	05.02.2011	Filtration	UC-Digest	431	Ni 60(MR)	0,618	4,0	0,0380	6,46E-10	0,646

119	10	20	500	05.02.2011	Filtration	UC-Digest	432	Ni 60(MR)	0,266	6,1	0,0319	5,43E-10	0,543
120	10	10	350	05.02.2011	Filtration	UC-Digest	433	Ni 60(MR)	0,084	6,1	0,0145	2,46E-10	0,246
121	10	2	200	05.02.2011	Filtration	UC-Digest	434	Ni 60(MR)	0,094	9,0	0,0283	4,82E-10	0,482
122	10	0,2	120	05.02.2011	Filtration	UC-Digest	435	Ni 60(MR)	0,040	4,6	0,0201	3,42E-10	0,342
143	1	140	2000	13.02.2011	Filtration	UC-Digest	456	Ni 60(MR)	0,013	10,1	0,0004	6,85E-12	0,007
144	1	20	2000	13.02.2011	Filtration	UC-Digest	457	Ni 60(MR)	0,101	7,1	0,0030	5,18E-11	0,052
145	1	10	600	13.02.2011	Filtration	UC-Digest	458	Ni 60(MR)	0,017	16,8	0,0017	2,95E-11	0,030
146	1	2	400	13.02.2011	Filtration	UC-Digest	459	Ni 60(MR)	0,040	8,9	0,0059	1,01E-10	0,101
147	1	0,2	400	13.02.2011	Filtration	UC-Digest	460	Ni 60(MR)	0,058	8,5	0,0087	1,49E-10	0,149
148	2	140	2000	13.02.2011	Filtration	UC-Digest	461	Ni 60(MR)	0,164	3,5	0,0049	8,39E-11	0,084
149	2	20	2000	13.02.2011	Filtration	UC-Digest	462	Ni 60(MR)	0,195	2,3	0,0058	9,95E-11	0,099
150	2	10	400	13.02.2011	Filtration	UC-Digest	463	Ni 60(MR)	0,016	7,3	0,0023	3,99E-11	0,040
151	2	2	300	13.02.2011	Filtration	UC-Digest	464	Ni 60(MR)	0,026	10,7	0,0052	8,88E-11	0,089
152	2	0,2	200	13.02.2011	Filtration	UC-Digest	465	Ni 60(MR)	0,013	11,9	0,0039	6,64E-11	0,066
153	3	140	2000	13.02.2011	Filtration	UC-Digest	466	Ni 60(MR)	0,727	0,7	0,0218	3,72E-10	0,372
154	3	20	1000	13.02.2011	Filtration	UC-Digest	467	Ni 60(MR)	0,333	6,6	0,0200	3,40E-10	0,340
155	3	10	250	13.02.2011	Filtration	UC-Digest	468	Ni 60(MR)	0,048	10,2	0,0116	1,97E-10	0,197
156	3	2	150	13.02.2011	Filtration	UC-Digest	469	Ni 60(MR)	0,038	9,8	0,0153	2,61E-10	0,261
157	3	0,2	150	13.02.2011	Filtration	UC-Digest	470	Ni 60(MR)	0,003	17,2	0,0010	1,72E-11	0,017
158	4	140	2000	13.02.2011	Filtration	UC-Digest	471	Ni 60(MR)	0,583	2,6	0,0175	2,98E-10	0,298
159	4	20	1000	13.02.2011	Filtration	UC-Digest	472	Ni 60(MR)	0,177	5,5	0,0106	1,81E-10	0,181
160	4	10	250	13.02.2011	Filtration	UC-Digest	473	Ni 60(MR)	0,003	2,8	0,0007	1,20E-11	0,012
161	4	2	250	13.02.2011	Filtration	UC-Digest	474	Ni 60(MR)	0,017	7,8	0,0042	7,12E-11	0,071
162	4	0,2	200	13.02.2011	Filtration	UC-Digest	475	Ni 60(MR)	0,082	5,4	0,0247	4,20E-10	0,420
163	5	140	2000	13.02.2011	Filtration	UC-Digest	476	Ni 60(MR)	0,183	3,0	0,0055	9,34E-11	0,093
164	5	20	500	13.02.2011	Filtration	UC-Digest	477	Ni 60(MR)	0,172	8,0	0,0210	3,57E-10	0,357
165	5	10	200	13.02.2011	Filtration	UC-Digest	478	Ni 60(MR)	0,003	20,1	0,0010	1,72E-11	0,017
166	5	2	200	13.02.2011	Filtration	UC-Digest	479	Ni 60(MR)	0,009	7,5	0,0027	4,61E-11	0,046
167	5	0,2	200	13.02.2011	Filtration	UC-Digest	480	Ni 60(MR)	0,033	14,4	0,0100	1,71E-10	0,171
168	6	140	2000	14.02.2011	Filtration	UC-Digest	481	Ni 60(MR)	0,000	10,8	0,0000	-6,31E-14	0,000
169	6	20	1000	14.02.2011	Filtration	UC-Digest	482	Ni 60(MR)	0,019	6,5	0,0011	1,90E-11	0,019
170	6	10	500	14.02.2011	Filtration	UC-Digest	483	Ni 60(MR)	0,019	5,2	0,0023	3,89E-11	0,039
171	6	2	300	14.02.2011	Filtration	UC-Digest	484	Ni 60(MR)	0,010	9,9	0,0020	3,37E-11	0,034
172	6	0,2	300	14.02.2011	Filtration	UC-Digest	485	Ni 60(MR)	0,004	6,7	0,0008	1,44E-11	0,014

173	7	140	2000	14.02.2011	Filtration	UC-Digest	486	Ni 60(MR)	0,041	9,6	0,0012	2,11E-11	0,021
174	7	20	1000	14.02.2011	Filtration	UC-Digest	487	Ni 60(MR)	0,072	3,8	0,0043	7,32E-11	0,073
175	7	10	395	14.02.2011	Filtration	UC-Digest	488	Ni 60(MR)	0,080	2,3	0,0122	2,08E-10	0,208
176	7	2	200	14.02.2011	Filtration	UC-Digest	489	Ni 60(MR)	0,028	9,9	0,0083	1,42E-10	0,142
177	7	0,2	200	14.02.2011	Filtration	UC-Digest	490	Ni 60(MR)	0,086	6,7	0,0259	4,42E-10	0,442
178	8	140	2000	14.02.2011	Filtration	UC-Digest	491	Ni 60(MR)	0,177	2,9	0,0053	9,04E-11	0,090
179	8	20	1000	14.02.2011	Filtration	UC-Digest	492	Ni 60(MR)	0,309	3,5	0,0185	3,16E-10	0,316
180	8	10	300	14.02.2011	Filtration	UC-Digest	493	Ni 60(MR)	0,036	13,6	0,0071	1,21E-10	0,121
181	8	2	100	14.02.2011	Filtration	UC-Digest	494	Ni 60(MR)	0,018	18,5	0,0109	1,85E-10	0,185
182	8	0,2	200	14.02.2011	Filtration	UC-Digest	495	Ni 60(MR)	0,073	8,6	0,0220	3,75E-10	0,375
183	9	140	2000	14.02.2011	Filtration	UC-Digest	496	Ni 60(MR)	0,970	2,9	0,0291	4,95E-10	0,495
184	9	20	1000	14.02.2011	Filtration	UC-Digest	497	Ni 60(MR)	0,299	8,8	0,0180	3,06E-10	0,306
185	9	10	150	14.02.2011	Filtration	UC-Digest	498	Ni 60(MR)	0,043	8,2	0,0172	2,92E-10	0,292
186	9	2	150	14.02.2011	Filtration	UC-Digest	499	Ni 60(MR)	-	-	-	-	-
187	9	0,2	150	14.02.2011	Filtration	UC-Digest	500	Ni 60(MR)	0,022	10,7	0,0086	1,47E-10	0,147
188	10	140	1500	14.02.2011	Filtration	UC-Digest	501	Ni 60(MR)	0,080	0,5	0,0032	5,45E-11	0,054
189	10	20	500	14.02.2011	Filtration	UC-Digest	502	Ni 60(MR)	0,208	9,8	0,0249	4,25E-10	0,425
190	10	10	130	14.02.2011	Filtration	UC-Digest	503	Ni 60(MR)	0,031	8,8	0,0142	2,42E-10	0,242
191	10	2	55	14.02.2011	Filtration	UC-Digest	504	Ni 60(MR)	0,023	16,9	0,0257	4,37E-10	0,437
192	10	0,2	55	14.02.2011	Filtration	UC-Digest	505	Ni 60(MR)	0,197	6,9	0,2164	3,69E-09	3,685

Table C15: Results sheet Direct samples; nickel

								Concentration				
								Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
1	10 m	P	23.01.2011	Depth	Direct	529	Ni 60(MR)	0,250	2,4	2,50E-03	4,27E-11	0,043
1	10 m	P	23.01.2011	Depth	Direct	529	Ni 60(MR)	0,276	7,3	2,76E-03	4,70E-11	0,047
3	10 m	D	23.01.2011	Depth	Direct	530	Ni 60(MR)	0,292	5,0	2,92E-03	4,97E-11	0,050

5	5	P	23.01.2011	Tank	Direct	531	Ni 60(MR)	0,254	5,1	2,54E-03	4,33E-11	0,043
7	5	D	23.01.2011	Tank	Direct	532	Ni 60(MR)	0,258	8,4	2,58E-03	4,39E-11	0,044
9	Brk	P	24.01.2011	Depth	Direct	533	Ni 60(MR)	0,259	2,0	2,59E-03	4,42E-11	0,044
11	Brk	D	24.01.2011	Depth	Direct	534	Ni 60(MR)	0,273	7,1	2,73E-03	4,65E-11	0,046
13	1	P	26.01.2011	Tank	Direct	535	Ni 60(MR)	0,257	11,9	2,57E-03	4,38E-11	0,044
15	1	D	26.01.2011	Tank	Direct	536	Ni 60(MR)	0,249	6,3	2,49E-03	4,24E-11	0,042
17	2	P	26.01.2011	Tank	Direct	537	Ni 60(MR)	0,398	7,8	3,98E-03	6,78E-11	0,068
19	2	D	26.01.2011	Tank	Direct	538	Ni 60(MR)	0,238	1,1	2,38E-03	4,06E-11	0,041
21	3	P	26.01.2011	Tank	Direct	539	Ni 60(MR)	0,842	4,8	8,42E-03	1,44E-10	0,144
23	3	D	26.01.2011	Tank	Direct	540	Ni 60(MR)	0,644	7,3	6,44E-03	1,10E-10	0,110
23	3	D	23.01.2011	Tank	Direct		Ni 60(MR)	0,723	6,2	7,23E-03	1,23E-10	0,123
25	4	P	26.01.2011	Tank	Direct	541	Ni 60(MR)	0,280	5,1	2,80E-03	4,78E-11	0,048
27	4	D	26.01.2011	Tank	Direct	542	Ni 60(MR)	0,289	14,1	2,89E-03	4,93E-11	0,049
29	5	P	26.01.2011	Tank	Direct	543	Ni 60(MR)	0,363	9,3	3,63E-03	6,19E-11	0,062
31	5	D	26.01.2011	Tank	Direct	544	Ni 60(MR)	1,556	7,9	1,56E-02	2,65E-10	0,265
33	6	P	27.01.2011	Tank	Direct	545	Ni 60(MR)	0,483	9,7	4,83E-03	8,22E-11	0,082
35	6	D	27.01.2011	Tank	Direct	546	Ni 60(MR)	0,477	7,5	4,77E-03	8,13E-11	0,081
37	7	P	27.01.2011	Tank	Direct	547	Ni 60(MR)	0,577	4,4	5,77E-03	9,82E-11	0,098
39	7	D	27.01.2011	Tank	Direct	548	Ni 60(MR)	0,475	2,4	4,75E-03	8,09E-11	0,081
41	8	P	27.01.2011	Tank	Direct	549	Ni 60(MR)	0,496	4,3	4,96E-03	8,44E-11	0,084
43	8	D	27.01.2011	Tank	Direct	550	Ni 60(MR)	0,453	9,7	4,53E-03	7,71E-11	0,077
45	9	P	27.01.2011	Tank	Direct	551	Ni 60(MR)	0,462	10,8	4,62E-03	7,88E-11	0,079
47	9	D	27.01.2011	Tank	Direct	552	Ni 60(MR)	0,472	8,4	4,72E-03	8,05E-11	0,080
49	10	P	27.01.2011	Tank	Direct	553	Ni 60(MR)	0,460	14,0	4,60E-03	7,83E-11	0,078
51	10	D	27.01.2011	Tank	Direct	554	Ni 60(MR)	0,837	8,2	8,37E-03	1,43E-10	0,143
53	1	P	29.01.2011	Tank	Direct	555	Ni 60(MR)	0,832	11,2	8,32E-03	1,42E-10	0,142
55	1	D	29.01.2011	Tank	Direct	556	Ni 60(MR)	0,832	8,3	8,32E-03	1,42E-10	0,142
57	2	P	29.01.2011	Tank	Direct	557	Ni 60(MR)	0,886	6,3	8,86E-03	1,51E-10	0,151
59	2	D	29.01.2011	Tank	Direct	558	Ni 60(MR)	0,819	14,4	8,19E-03	1,39E-10	0,139

61	3	P	29.01.2011	Tank	Direct	559	Ni 60(MR)	0,828	2,7	8,28E-03	1,41E-10	0,141
63	3	D	29.01.2011	Tank	Direct	560	Ni 60(MR)	0,887	8,2	8,87E-03	1,51E-10	0,151
65	4	P	29.01.2011	Tank	Direct	561	Ni 60(MR)	0,926	6,0	9,26E-03	1,58E-10	0,158
67	4	D	29.01.2011	Tank	Direct	562	Ni 60(MR)	1,062	4,4	1,06E-02	1,81E-10	0,181
69	5	P	29.01.2011	Tank	Direct	563	Ni 60(MR)	0,888	9,2	8,88E-03	1,51E-10	0,151
71	5	D	29.01.2011	Tank	Direct	564	Ni 60(MR)	0,906	8,8	9,06E-03	1,54E-10	0,154
73	6	P	30.01.2011	Tank	Direct	565	Ni 60(MR)	0,991	0,9	9,91E-03	1,69E-10	0,169
75	6	D	30.01.2011	Tank	Direct	566	Ni 60(MR)	0,896	2,1	8,96E-03	1,53E-10	0,153
77	7	P	30.01.2011	Tank	Direct	567	Ni 60(MR)	0,992	1,5	9,92E-03	1,69E-10	0,169
79	7	D	30.01.2011	Tank	Direct	568	Ni 60(MR)	0,924	6,8	9,24E-03	1,57E-10	0,157
81	8	P	30.01.2011	Tank	Direct	569	Ni 60(MR)	0,924	8,5	9,24E-03	1,57E-10	0,157
83	8	D	30.01.2011	Tank	Direct	570	Ni 60(MR)	0,988	3,6	9,88E-03	1,68E-10	0,168
85	9	P	30.01.2011	Tank	Direct	571	Ni 60(MR)	0,976	5,9	9,76E-03	1,66E-10	0,166
87	9	D	30.01.2011	Tank	Direct	572	Ni 60(MR)	0,970	5,8	9,70E-03	1,65E-10	0,165
89	10	P	30.01.2011	Tank	Direct	573	Ni 60(MR)	0,968	10,9	9,68E-03	1,65E-10	0,165
91	10	D	30.01.2011	Tank	Direct	574	Ni 60(MR)	0,878	10,2	8,78E-03	1,50E-10	0,150
93	1	P	01.02.2011	Tank	Direct	575	Ni 60(MR)	0,943	1,4	9,43E-03	1,61E-10	0,161
95	1	D	01.02.2011	Tank	Direct	576	Ni 60(MR)	1,006	3,0	1,01E-02	1,71E-10	0,171
97	2	P	01.02.2011	Tank	Direct	577	Ni 60(MR)	0,997	3,4	9,97E-03	1,70E-10	0,170
99	2	D	01.02.2011	Tank	Direct	578	Ni 60(MR)	1,033	3,1	1,03E-02	1,76E-10	0,176
101	3	P	01.02.2011	Tank	Direct	579	Ni 60(MR)	0,942	6,0	9,42E-03	1,61E-10	0,161
103	3	D	01.02.2011	Tank	Direct	580	Ni 60(MR)	0,971	3,8	9,71E-03	1,65E-10	0,165
105	4	P	01.02.2011	Tank	Direct	581	Ni 60(MR)	1,002	1,6	1,00E-02	1,71E-10	0,171
107	4	D	01.02.2011	Tank	Direct	582	Ni 60(MR)	1,066	2,2	1,07E-02	1,82E-10	0,182
109	5	P	01.02.2011	Tank	Direct	583	Ni 60(MR)	1,017	8,7	1,02E-02	1,73E-10	0,173
111	5	D	01.02.2011	Tank	Direct	584	Ni 60(MR)	1,012	14,2	1,01E-02	1,72E-10	0,172
113	6	P	02.02.2011	Tank	Direct	585	Ni 60(MR)	1,067	2,3	1,07E-02	1,82E-10	0,182
115	6	D	02.02.2011	Tank	Direct	586	Ni 60(MR)	1,013	4,6	1,01E-02	1,73E-10	0,173
117	7	P	02.02.2011	Tank	Direct	587	Ni 60(MR)	1,019	1,5	1,02E-02	1,74E-10	0,174

119	7	D	02.02.2011	Tank	Direct	588	Ni 60(MR)	1,013	5,1	1,01E-02	1,73E-10	0,173
121	8	P	02.02.2011	Tank	Direct	589	Ni 60(MR)	0,797	3,5	7,97E-03	1,36E-10	0,136
123	8	D	02.02.2011	Tank	Direct	590	Ni 60(MR)	0,850	6,7	8,50E-03	1,45E-10	0,145
125	9	P	02.02.2011	Tank	Direct	591	Ni 60(MR)	0,595	2,3	5,95E-03	1,01E-10	0,101
127	9	D	02.02.2011	Tank	Direct	592	Ni 60(MR)	0,758	7,6	7,58E-03	1,29E-10	0,129
129	10	P	02.02.2011	Tank	Direct	593	Ni 60(MR)	0,819	1,4	8,19E-03	1,40E-10	0,140
131	10	D	02.02.2011	Tank	Direct	594	Ni 60(MR)	0,840	4,0	8,40E-03	1,43E-10	0,143
133	1	P	04.02.2011	Tank	Direct	595	Ni 60(MR)	0,770	4,9	7,70E-03	1,31E-10	0,131
135	1	D	04.02.2011	Tank	Direct	596	Ni 60(MR)	0,559	4,5	5,59E-03	9,53E-11	0,095
137	2	P	04.02.2011	Tank	Direct	597	Ni 60(MR)	0,810	1,3	8,10E-03	1,38E-10	0,138
139	2	D	04.02.2011	Tank	Direct	598	Ni 60(MR)	0,758	8,6	7,58E-03	1,29E-10	0,129
141	3	P	04.02.2011	Tank	Direct	599	Ni 60(MR)	0,735	5,0	7,35E-03	1,25E-10	0,125
143	3	D	04.02.2011	Tank	Direct	600	Ni 60(MR)	0,824	3,6	8,24E-03	1,40E-10	0,140
145	4	P	04.02.2011	Tank	Direct	601	Ni 60(MR)	0,547	10,6	5,47E-03	9,31E-11	0,093
147	4	D	04.02.2011	Tank	Direct	602	Ni 60(MR)	7,478	3,2	7,48E-02	1,27E-09	1,274
149	5	P	04.02.2011	Tank	Direct	603	Ni 60(MR)	1,180	8,4	1,18E-02	2,01E-10	0,201
151	5	D	04.02.2011	Tank	Direct	604	Ni 60(MR)	0,457	7,5	4,57E-03	7,79E-11	0,078
153	6	P	05.02.2011	Tank	Direct	605	Ni 60(MR)	0,709	10,0	7,09E-03	1,21E-10	0,121
154	6	D	05.02.2011	Tank	Direct	606	Ni 60(MR)	0,933	7,6	9,33E-03	1,59E-10	0,159
155	7	P	05.02.2011	Tank	Direct	607	Ni 60(MR)	0,819	11,4	8,19E-03	1,40E-10	0,140
156	7	D	05.02.2011	Tank	Direct	608	Ni 60(MR)	0,459	2,5	4,59E-03	7,82E-11	0,078
157	8	P	05.02.2011	Tank	Direct	609	Ni 60(MR)	0,693	7,9	6,93E-03	1,18E-10	0,118
158	8	D	05.02.2011	Tank	Direct	610	Ni 60(MR)	0,721	3,6	7,21E-03	1,23E-10	0,123
159	9	P	05.02.2011	Tank	Direct	611	Ni 60(MR)	0,791	10,9	7,91E-03	1,35E-10	0,135
160	9	D	05.02.2011	Tank	Direct	612	Ni 60(MR)	0,746	2,7	7,46E-03	1,27E-10	0,127
161	10	P	05.02.2011	Tank	Direct	613	Ni 60(MR)	11,574	4,3	1,16E-01	1,97E-09	1,972
162	10	D	05.02.2011	Tank	Direct	614	Ni 60(MR)	0,676	4,4	6,76E-03	1,15E-10	0,115
163	1	P	07.02.2011	Tank	Direct	615	Ni 60(MR)	0,682	5,6	6,82E-03	1,16E-10	0,116
164	1	D	07.02.2011	Tank	Direct	616	Ni 60(MR)	0,713	6,3	7,13E-03	1,22E-10	0,122

165	2	P	07.02.2011	Tank	Direct	617	Ni 60(MR)	0,825	0,9	8,25E-03	1,41E-10	0,141
166	2	D	07.02.2011	Tank	Direct	618	Ni 60(MR)	1,890	4,3	1,89E-02	3,22E-10	0,322
167	3	P	07.02.2011	Tank	Direct	619	Ni 60(MR)	0,645	10,0	6,45E-03	1,10E-10	0,110
168	3	D	07.02.2011	Tank	Direct	620	Ni 60(MR)	2,403	3,0	2,40E-02	4,09E-10	0,409
169	4	P	07.02.2011	Tank	Direct	621	Ni 60(MR)	0,645	3,5	6,45E-03	1,10E-10	0,110
170	4	D	07.02.2011	Tank	Direct	622	Ni 60(MR)	0,561	16,3	5,61E-03	9,55E-11	0,096
171	5	P	07.02.2011	Tank	Direct	623	Ni 60(MR)	1,167	7,6	1,17E-02	1,99E-10	0,199
172	5	D	07.02.2011	Tank	Direct	624	Ni 60(MR)	0,687	3,2	6,87E-03	1,17E-10	0,117
173	6	P	08.02.2011	Tank	Direct	625	Ni 60(MR)	0,596	8,0	5,96E-03	1,02E-10	0,102
174	6	D	08.02.2011	Tank	Direct	626	Ni 60(MR)	0,652	3,7	6,52E-03	1,11E-10	0,111
175	7	P	08.02.2011	Tank	Direct	627	Ni 60(MR)	0,556	8,0	5,56E-03	9,47E-11	0,095
176	7	D	08.02.2011	Tank	Direct	628	Ni 60(MR)	0,632	14,8	6,32E-03	1,08E-10	0,108
177	8	P	08.02.2011	Tank	Direct	629	Ni 60(MR)	0,615	12,7	6,15E-03	1,05E-10	0,105
178	8	D	08.02.2011	Tank	Direct	630	Ni 60(MR)	0,619	3,3	6,19E-03	1,05E-10	0,105
179	9	P	08.02.2011	Tank	Direct	631	Ni 60(MR)	0,587	12,1	5,87E-03	1,00E-10	0,100
180	9	D	08.02.2011	Tank	Direct	632	Ni 60(MR)	0,653	14,2	6,53E-03	1,11E-10	0,111
181	10	P	08.02.2011	Tank	Direct	633	Ni 60(MR)	0,574	0,9	5,74E-03	9,78E-11	0,098
182	10	D	08.02.2011	Tank	Direct	634	Ni 60(MR)	0,671	9,2	6,71E-03	1,14E-10	0,114
183	1	P	10.02.2011	Tank	Direct	635	Ni 60(MR)	0,632	7,2	6,32E-03	1,08E-10	0,108
184	1	D	10.02.2011	Tank	Direct	636	Ni 60(MR)	0,695	3,1	6,95E-03	1,18E-10	0,118
185	2	P	10.02.2011	Tank	Direct	637	Ni 60(MR)	0,672	10,6	6,72E-03	1,14E-10	0,114
186	2	D	10.02.2011	Tank	Direct	638	Ni 60(MR)	0,603	12,9	6,03E-03	1,03E-10	0,103
187	3	P	10.02.2011	Tank	Direct	639	Ni 60(MR)	0,639	3,3	6,39E-03	1,09E-10	0,109
188	3	D	10.02.2011	Tank	Direct	640	Ni 60(MR)	0,615	8,7	6,15E-03	1,05E-10	0,105
189	4	P	10.02.2011	Tank	Direct	641	Ni 60(MR)	0,692	5,0	6,92E-03	1,18E-10	0,118
190	4	D	10.02.2011	Tank	Direct	642	Ni 60(MR)	0,623	6,2	6,23E-03	1,06E-10	0,106
191	5	P	10.02.2011	Tank	Direct	643	Ni 60(MR)	0,673	9,1	6,73E-03	1,15E-10	0,115
192	5	D	10.02.2011	Tank	Direct	644	Ni 60(MR)	0,615	3,7	6,15E-03	1,05E-10	0,105
193	6	P	11.02.2011	Tank	Direct	645	Ni 60(MR)	0,624	8,1	6,24E-03	1,06E-10	0,106

194	6	D	11.02.2011	Tank	Direct	646	Ni 60(MR)	0,588	1,0	5,88E-03	1,00E-10	0,100
195	7	P	11.02.2011	Tank	Direct	647	Ni 60(MR)	0,635	4,2	6,35E-03	1,08E-10	0,108
196	7	D	11.02.2011	Tank	Direct	648	Ni 60(MR)	0,630	18,9	6,30E-03	1,07E-10	0,107
197	8	P	11.02.2011	Tank	Direct	649	Ni 60(MR)	1,610	8,2	1,61E-02	2,74E-10	0,274
198	8	D	11.02.2011	Tank	Direct	650	Ni 60(MR)	0,622	13,6	6,22E-03	1,06E-10	0,106
199	9	P	11.02.2011	Tank	Direct	651	Ni 60(MR)	0,597	4,2	5,97E-03	1,02E-10	0,102
200	9	D	11.02.2011	Tank	Direct	652	Ni 60(MR)	0,604	5,5	6,04E-03	1,03E-10	0,103
201	10	P	11.02.2011	Tank	Direct	653	Ni 60(MR)	0,585	8,4	5,85E-03	9,96E-11	0,100
202	10	D	11.02.2011	Tank	Direct	654	Ni 60(MR)	0,578	8,7	5,78E-03	9,84E-11	0,098
203	1	P	13.02.2011	Tank	Direct	655	Ni 60(MR)	0,671	2,5	6,71E-03	1,14E-10	0,114
204	1	D	13.02.2011	Tank	Direct	656	Ni 60(MR)	0,645	6,7	6,45E-03	1,10E-10	0,110
205	2	P	13.02.2011	Tank	Direct	657	Ni 60(MR)	0,772	9,1	7,72E-03	1,31E-10	0,131
206	2	D	13.02.2011	Tank	Direct	658	Ni 60(MR)	0,811	5,0	8,11E-03	1,38E-10	0,138
207	3	P	13.02.2011	Tank	Direct	659	Ni 60(MR)	0,822	7,5	8,22E-03	1,40E-10	0,140
208	3	D	13.02.2011	Tank	Direct	660	Ni 60(MR)	0,750	4,8	7,50E-03	1,28E-10	0,128
209	4	P	13.02.2011	Tank	Direct	661	Ni 60(MR)	0,773	7,3	7,73E-03	1,32E-10	0,132
210	4	D	13.02.2011	Tank	Direct	662	Ni 60(MR)	0,711	6,1	7,11E-03	1,21E-10	0,121
211	5	P	13.02.2011	Tank	Direct	663	Ni 60(MR)	0,817	14,2	8,17E-03	1,39E-10	0,139
212	5	D	13.02.2011	Tank	Direct	664	Ni 60(MR)	0,676	14,1	6,76E-03	1,15E-10	0,115
213	6	P	14.02.2011	Tank	Direct	665	Ni 60(MR)	0,714	13,0	7,14E-03	1,22E-10	0,122
214	6	D	14.02.2011	Tank	Direct	666	Ni 60(MR)	0,733	7,4	7,33E-03	1,25E-10	0,125
215	7	P	14.02.2011	Tank	Direct	667	Ni 60(MR)	0,795	6,6	7,95E-03	1,35E-10	0,135
216	7	D	14.02.2011	Tank	Direct	668	Ni 60(MR)	0,815	7,1	8,15E-03	1,39E-10	0,139
217	8	P	14.02.2011	Tank	Direct	669	Ni 60(MR)	0,767	9,7	7,67E-03	1,31E-10	0,131
218	8	D	14.02.2011	Tank	Direct	670	Ni 60(MR)	0,763	5,4	7,63E-03	1,30E-10	0,130
219	9	P	14.02.2011	Tank	Direct	671	Ni 60(MR)	0,945	7,5	9,45E-03	1,61E-10	0,161
220	9	D	14.02.2011	Tank	Direct	672	Ni 60(MR)	0,734	11,0	7,34E-03	1,25E-10	0,125
221	10	P	14.02.2011	Tank	Direct	673	Ni 60(MR)	0,751	10,0	7,51E-03	1,28E-10	0,128
222	10	D	14.02.2011	Tank	Direct	674	Ni 60(MR)	0,758	1,7	7,58E-03	1,29E-10	0,129

	0 m	P		Depth Profile	Direct	675	Ni 60(MR)	5,861	4,9	5,86E-02	9,99E-10	0,999
	0 m	D		Depth Profile	Direct	676	Ni 60(MR)	0,832	5,0	8,32E-03	1,42E-10	0,142
	4 m	P		Depth Profile	Direct	677	Ni 60(MR)	0,725	8,9	7,25E-03	1,24E-10	0,124
	4 m	D		Depth Profile	Direct	678	Ni 60(MR)	0,788	12,2	7,88E-03	1,34E-10	0,134
	10 m	P		Depth Profile	Direct	679	Ni 60(MR)	0,749	8,4	7,49E-03	1,28E-10	0,128
	10 m	D		Depth Profile	Direct	680	Ni 60(MR)	0,804	6,9	8,04E-03	1,37E-10	0,137
	30 m	P		Depth Profile	Direct	681	Ni 60(MR)	0,759	6,3	7,59E-03	1,29E-10	0,129
	30 m	D		Depth Profile	Direct	682	Ni 60(MR)	0,742	1,7	7,42E-03	1,26E-10	0,126
	50 m	P		Depth Profile	Direct	683	Ni 60(MR)	0,777	6,4	7,77E-03	1,32E-10	0,132
	50 m	D		Depth Profile	Direct	684	Ni 60(MR)	0,812	8,4	8,12E-03	1,38E-10	0,138
	70 m	P		Depth Profile	Direct	685	Ni 60(MR)	0,787	8,3	7,87E-03	1,34E-10	0,134
	70 m	D		Depth Profile	Direct	686	Ni 60(MR)	0,733	15,7	7,33E-03	1,25E-10	0,125
A		P		River	Direct	687	Ni 60(MR)	0,761	6,1	7,61E-03	1,30E-10	0,130
A		D		River	Direct	688	Ni 60(MR)	0,767	3,8	7,67E-03	1,31E-10	0,131
B		P		River	Direct	689	Ni 60(MR)	0,727	2,7	7,27E-03	1,24E-10	0,124
B		D		River	Direct	690	Ni 60(MR)	0,750	8,0	7,50E-03	1,28E-10	0,128
C		P		River	Direct	691	Ni 60(MR)	0,682	6,3	6,82E-03	1,16E-10	0,116
C		D		River	Direct	692	Ni 60(MR)	0,694	12,0	6,94E-03	1,18E-10	0,118

Table C16: Results sheet Chelex samples; copper

									Concentration				
									Uncorrected		Corrected		
Smpl	Tank/Depth	Fract	Vol (mL)	Date	Type of sample	Method	Project-Inr	Element	$\mu g.L^{-1}$	RSD %	$\mu g.L^{-1}$	$Mol.L^{-1}$	nM
1	10 m	P	159	23.01.2011	Depth	Chelex	1	Cu 63(MR)	3,08	2,3	0,097	1,53E-09	1,53
2	10 m	D	166	23.01.2011	Depth	Chelex	2	Cu 63(MR)	3,04	4,2	0,092	1,44E-09	1,44
3	5	P	153	23.01.2011	Tank	Chelex	3	Cu 63(MR)	2,96	2,1	0,096	1,52E-09	1,52

4	5	D	170	24.01.2011	Tank	Chelex	4	Cu 63(MR)	2,50	9,0	0,074	1,16E-09	1,16
5	Brk	P	151	24.01.2011	Depth	Chelex	5	Cu 63(MR)	2,44	2,1	0,081	1,27E-09	1,27
6	Brk	D	160	24.01.2011	Depth	Chelex	6	Cu 63(MR)	4,59	2,6	0,144	2,26E-09	2,26
7	1	P	165	26.01.2011	Tank	Chelex	7	Cu 63(MR)	4,75	3,9	0,144	2,26E-09	2,26
8	1	D	164	26.01.2011	Tank	Chelex	8	Cu 63(MR)	1,81	17,7	0,055	8,69E-10	0,87
9	2	P	167	26.01.2011	Tank	Chelex	9	Cu 63(MR)	3,37	2,9	0,101	1,58E-09	1,58
10	2	D	159	26.01.2011	Tank	Chelex	10	Cu 63(MR)	4,53	2,2	0,142	2,23E-09	2,23
11	3	P	149	26.01.2011	Tank	Chelex	11	Cu 63(MR)	4,51	8,2	0,151	2,38E-09	2,38
12	3	D	176	26.01.2011	Tank	Chelex	12	Cu 63(MR)	3,04	7,5	0,086	1,36E-09	1,36
13	4	P	143	26.01.2011	Tank	Chelex	13	Cu 63(MR)	3,38	0,7	0,118	1,85E-09	1,85
14	4	D	173	26.01.2011	Tank	Chelex	14	Cu 63(MR)	4,43	8,7	0,128	2,02E-09	2,02
15	5	P	143	26.01.2011	Tank	Chelex	15	Cu 63(MR)	9,17	3,0	0,321	5,05E-09	5,05
16	5	D	162	26.01.2011	Tank	Chelex	16	Cu 63(MR)	4,07	4,0	0,126	1,98E-09	1,98
17	6	P	161	27.01.2011	Tank	Chelex	17	Cu 63(MR)	2,84	3,6	0,088	1,39E-09	1,39
18	6	D	175	27.01.2011	Tank	Chelex	18	Cu 63(MR)	4,12	2,6	0,118	1,85E-09	1,85
19	7	P	176	27.01.2011	Tank	Chelex	19	Cu 63(MR)	3,89	2,8	0,111	1,74E-09	1,74
20	7	D	143	27.01.2011	Tank	Chelex	20	Cu 63(MR)	1,71	3,2	0,060	9,41E-10	0,94
21	8	P	159	27.01.2011	Tank	Chelex	21	Cu 63(MR)	2,35	7,8	0,074	1,16E-09	1,16
22	8	D	157	27.01.2011	Tank	Chelex	22	Cu 63(MR)	2,33	0,7	0,074	1,17E-09	1,17
23	9	P	183	27.01.2011	Tank	Chelex	23	Cu 63(MR)	2,70	2,8	0,074	1,16E-09	1,16
24	9	D	158	27.01.2011	Tank	Chelex	24	Cu 63(MR)	3,05	3,1	0,096	1,51E-09	1,51
25	10	P	176	27.01.2011	Tank	Chelex	25	Cu 63(MR)	2,51	7,9	0,071	1,12E-09	1,12
26	10	D	164	27.01.2011	Tank	Chelex	26	Cu 63(MR)	2,19	4,3	0,067	1,05E-09	1,05
27	1	P	184	29.01.2011	Tank	Chelex	27	Cu 63(MR)	2,11	7,7	0,057	9,03E-10	0,90
28	1	D	173	29.01.2011	Tank	Chelex	28	Cu 63(MR)	2,54	1,2	0,073	1,15E-09	1,15
29	2	P	176	29.01.2011	Tank	Chelex	29	Cu 63(MR)	2,58	6,1	0,073	1,15E-09	1,15
30	2	D	116	29.01.2011	Tank	Chelex	30	Cu 63(MR)	3,20	4,4	0,138	2,18E-09	2,18
31	3	P	180	29.01.2011	Tank	Chelex	31	Cu 63(MR)	2,48	4,1	0,069	1,08E-09	1,08
32	3	D	112	29.01.2011	Tank	Chelex	32	Cu 63(MR)	2,22	3,0	0,100	1,57E-09	1,57
33	4	P	159	29.01.2011	Tank	Chelex	33	Cu 63(MR)	2,51	3,0	0,079	1,24E-09	1,24
34	4	D	161	29.01.2011	Tank	Chelex	34	Cu 63(MR)	3,84	5,7	0,119	1,88E-09	1,88
35	5	P	160	29.01.2011	Tank	Chelex	35	Cu 63(MR)	1,69	5,8	0,053	8,33E-10	0,83
36	5	D	161	29.01.2011	Tank	Chelex	36	Cu 63(MR)	2,13	3,0	0,066	1,04E-09	1,04
37	6	P	117	30.01.2011	Tank	Chelex	37	Cu 63(MR)	1,44	8,4	0,061	9,66E-10	0,97

38	6	D	123	30.01.2011	Tank	Chelex	38	Cu 63(MR)	1,13	8,3	0,046	7,18E-10	0,72
39	7	P	125	30.01.2011	Tank	Chelex	39	Cu 63(MR)	1,70	7,0	0,068	1,07E-09	1,07
40	7	D	131	30.01.2011	Tank	Chelex	40	Cu 63(MR)	1,68	3,4	0,064	1,01E-09	1,01
41	8	P	111	30.01.2011	Tank	Chelex	41	Cu 63(MR)	2,64	2,0	0,119	1,88E-09	1,88
42	8	D	124	30.01.2011	Tank	Chelex	42	Cu 63(MR)	1,91	3,5	0,077	1,21E-09	1,21
43	9	P	125	30.01.2011	Tank	Chelex	43	Cu 63(MR)	1,99	3,0	0,080	1,25E-09	1,25
44	9	D	128	30.01.2011	Tank	Chelex	44	Cu 63(MR)	2,69	1,9	0,106	1,66E-09	1,66
45	10	P	122	30.01.2011	Tank	Chelex	45	Cu 63(MR)	2,60	5,1	0,107	1,68E-09	1,68
46	10	D	126	30.01.2011	Tank	Chelex	46	Cu 63(MR)	1,67	2,0	0,066	1,04E-09	1,04
47	1	P	161	04.02.2011	Tank	Chelex	47	Cu 63(MR)	2,61	4,9	0,081	1,27E-09	1,27
48	1	D	120	04.02.2011	Tank	Chelex	48	Cu 63(MR)	2,24	3,6	0,093	1,47E-09	1,47
49	2	P	112	04.02.2011	Tank	Chelex	49	Cu 63(MR)	1,76	3,1	0,078	1,23E-09	1,23
50	2	D	114	04.02.2011	Tank	Chelex	50	Cu 63(MR)	2,30	5,8	0,101	1,58E-09	1,58
51	3	P	116	04.02.2011	Tank	Chelex	51	Cu 63(MR)	4,99	7,4	0,215	3,38E-09	3,38
52	3	D	116	04.02.2011	Tank	Chelex	52	Cu 63(MR)	2,49	6,9	0,107	1,69E-09	1,69
53	4	P	152	04.02.2011	Tank	Chelex	53	Cu 63(MR)	3,58	2,4	0,117	1,84E-09	1,84
53	4	P	152	04.02.2011	Tank	Chelex	53	Cu 63(MR)	3,52	2,1	0,116	1,82E-09	1,82
54	4	D	150	04.02.2011	Tank	Chelex	54	Cu 63(MR)	2,13	0,6	0,071	1,12E-09	1,12
55	5	P	169	04.02.2011	Tank	Chelex	55	Cu 63(MR)	2,95	2,3	0,087	1,37E-09	1,37
56	5	D	140	04.02.2011	Tank	Chelex	56	Cu 63(MR)	1,13	2,1	0,040	6,33E-10	0,63
57	6	P	182	05.02.2011	Tank	Chelex	57	Cu 63(MR)	2,51	2,9	0,069	1,09E-09	1,09
58	6	D	174	05.02.2011	Tank	Chelex	58	Cu 63(MR)	-0,53	5,3	-0,015	-2,40E-10	-0,24
59	7	P	155	05.02.2011	Tank	Chelex	59	Cu 63(MR)	2,31	3,6	0,074	1,17E-09	1,17
60	7	D	160	05.02.2011	Tank	Chelex	60	Cu 63(MR)	3,67	1,2	0,115	1,80E-09	1,80
61	8	P	152	05.02.2011	Tank	Chelex	61	Cu 63(MR)	2,01	0,8	0,066	1,04E-09	1,04
62	8	D	155	05.02.2011	Tank	Chelex	62	Cu 63(MR)	1,90	3,0	0,061	9,67E-10	0,97
63	9	P	173	05.02.2011	Tank	Chelex	63	Cu 63(MR)	1,64	1,6	0,048	7,47E-10	0,75
64	9	D	161	05.02.2011	Tank	Chelex	64	Cu 63(MR)	2,44	2,4	0,076	1,19E-09	1,19
65	10	P	144	05.02.2011	Tank	Chelex	65	Cu 63(MR)	3,49	0,7	0,121	1,91E-09	1,91
66	10	D	166	05.02.2011	Tank	Chelex	66	Cu 63(MR)	1,86	3,9	0,056	8,83E-10	0,88
67	1	P	119	13.02.2011	Tank	Chelex	67	Cu 63(MR)	2,34	1,4	0,098	1,54E-09	1,54
68	1	D	112	13.02.2011	Tank	Chelex	68	Cu 63(MR)	2,75	3,1	0,123	1,93E-09	1,93
69	2	P	126	13.02.2011	Tank	Chelex	69	Cu 63(MR)	3,23	1,7	0,128	2,01E-09	2,01
70	2	D	117	13.02.2011	Tank	Chelex	70	Cu 63(MR)	1,99	2,9	0,085	1,34E-09	1,34

71	3	P	117	13.02.2011	Tank	Chelex	71	Cu 63(MR)	3,02	2,2	0,129	2,02E-09	2,02
72	3	D	121	13.02.2011	Tank	Chelex	72	Cu 63(MR)	1,36	1,4	0,056	8,79E-10	0,88
73	4	P	121	13.02.2011	Tank	Chelex	73	Cu 63(MR)	1,77	1,2	0,073	1,15E-09	1,15
74	4	D	121	13.02.2011	Tank	Chelex	74	Cu 63(MR)	1,23	3,1	0,051	7,99E-10	0,80
75	5	P	101	13.02.2011	Tank	Chelex	75	Cu 63(MR)	1,49	3,9	0,073	1,15E-09	1,15
76	5	D	108	13.02.2011	Tank	Chelex	76	Cu 63(MR)	1,77	3,3	0,082	1,28E-09	1,28
77	6	P	120	14.02.2011	Tank	Chelex	77	Cu 63(MR)	-0,55	2,2	-0,023	-3,60E-10	-0,36
78	6	D	107	14.02.2011	Tank	Chelex	78	Cu 63(MR)	6,63	2,7	0,311	4,89E-09	4,89
79	7	P	117	14.02.2011	Tank	Chelex	79	Cu 63(MR)	1,38	2,1	0,059	9,31E-10	0,93
80	7	D	95	14.02.2011	Tank	Chelex	80	Cu 63(MR)	1,90	2,2	0,101	1,58E-09	1,58
81	8	P	112	14.02.2011	Tank	Chelex	81	Cu 63(MR)	3,85	2,0	0,172	2,71E-09	2,71
82	8	D	112	14.02.2011	Tank	Chelex	82	Cu 63(MR)	3,70	3,5	0,165	2,59E-09	2,59
83	9	P	102	14.02.2011	Tank	Chelex	83	Cu 63(MR)	6,02	2,1	0,296	4,65E-09	4,65
84	9	D	120	14.02.2011	Tank	Chelex	84	Cu 63(MR)	3,72	5,1	0,155	2,44E-09	2,44
85	10	P	117	14.02.2011	Tank	Chelex	85	Cu 63(MR)	2,11	1,0	0,090	1,42E-09	1,42
86	10	D	116	14.02.2011	Tank	Chelex	86	Cu 63(MR)	2,05	2,9	0,088	1,39E-09	1,39
A	10	P	120		Depth Profile	Chelex	87	Cu 63(MR)	3,91	1,4	0,163	2,56E-09	2,56
B	10	D	120		Depth Profile	Chelex	88	Cu 63(MR)	3,21	1,7	0,134	2,10E-09	2,10
C	0	P	122		Depth Profile	Chelex	89	Cu 63(MR)	0,45	7,5	0,019	2,91E-10	0,29
D	0	D	115		Depth Profile	Chelex	90	Cu 63(MR)	0,69	4,0	0,030	4,73E-10	0,47
E	4	P	120		Depth Profile	Chelex	91	Cu 63(MR)	4,45	3,5	0,185	2,92E-09	2,92
F	4	D	126		Depth Profile	Chelex	92	Cu 63(MR)	3,19	0,9	0,127	1,99E-09	1,99
G	50	P	103		Depth Profile	Chelex	93	Cu 63(MR)	3,54	3,9	0,172	2,70E-09	2,70
H	50	D	125		Depth Profile	Chelex	94	Cu 63(MR)	3,68	7,6	0,147	2,31E-09	2,31
I	30	P	125		Depth Profile	Chelex	95	Cu 63(MR)	3,21	3,2	0,128	2,02E-09	2,02
J	30	D	120		Depth Profile	Chelex	96	Cu 63(MR)	3,28	2,5	0,137	2,15E-09	2,15
K	70	P	100		Depth Profile	Chelex	97	Cu 63(MR)	1,69	3,4	0,084	1,33E-09	1,33
L	70	D	120		Depth Profile	Chelex	98	Cu 63(MR)	1,93	1,6	0,080	1,26E-09	1,26
M	A	P	28		River	Chelex	99	Cu 63(MR)	0,54	5,7	0,096	1,52E-09	1,52
N	B	P	50		River	Chelex	100	Cu 63(MR)	3,23	3,8	0,323	5,07E-09	5,07
O	C	P	48		River	Chelex	101	Cu 63(MR)	0,40	3,5	0,042	6,53E-10	0,65
P	A	D	45		River	Chelex	102	Cu 63(MR)	0,51	4,0	0,056	8,88E-10	0,89
Q	B	D	45		River	Chelex	103	Cu 63(MR)	0,15	4,4	0,017	2,67E-10	0,27
R	C	D	45		River	Chelex	104	Cu 63(MR)	0,27	4,4	0,030	4,77E-10	0,48

Table C17: Results sheet DGT samples; copper

										Concentration					
										Uncorrected		Corrected			
Smpl	Tank/Depth	Fract	Vol (mL)	Time (sec)	Date	Type of sample	Method	Project-Inr	Element	$\mu g.L^{-1}$	RSD %	$\mu g.L^{-1}$	M (ng) DGT	$Mol.L^{-1}$	nM
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	132	Cu 63(MR)	1,36	4,1	0,30	8,48	4,72E-09	4,72
1	10 m	D	1450	214740	23.01.2011	Depth	DGT	133	Cu 63(MR)	1,89	15,2	0,42	11,82	6,57E-09	6,57
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	134	Cu 63(MR)	5,36	2,6	1,00	33,50	1,57E-08	15,67
1	10 m	D	1450	255240	23.01.2011	Depth	DGT	135	Cu 63(MR)	1,19	5,1	0,22	7,42	3,47E-09	3,47
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	136	Cu 63(MR)	1,53	5,9	0,21	9,56	3,36E-09	3,36
1	10 m	D	1450	340140	23.01.2011	Depth	DGT	137	Cu 63(MR)	1,61	3,1	0,22	10,04	3,52E-09	3,52
2	5	D	1700	214740	23.01.2011	Tank	DGT	138	Cu 63(MR)	0,79	6,1	0,18	4,97	2,76E-09	2,76
2	5	D	1700	214740	23.01.2011	Tank	DGT	139	Cu 63(MR)	0,70	3,2	0,16	4,39	2,44E-09	2,44
2	5	D	1700	255240	23.01.2011	Tank	DGT	140	Cu 63(MR)	1,88	2,9	0,35	11,75	5,50E-09	5,50
2	5	D	1700	255240	23.01.2011	Tank	DGT	141	Cu 63(MR)	3,39	2,8	0,63	21,19	9,91E-09	9,91
2	5	D	1700	340140	23.01.2011	Tank	DGT	142	Cu 63(MR)	1,58	3,0	0,22	9,88	3,47E-09	3,47
2	5	D	1700	340140	23.01.2011	Tank	DGT	143	Cu 63(MR)	1,25	6,0	0,17	7,78	2,73E-09	2,73
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	144	Cu 63(MR)	0,54	2,3	0,14	3,37	2,27E-09	2,27
3	10 m	P	1260	177000	23.01.2011	Depth	DGT	145	Cu 63(MR)	0,43	1,1	0,12	2,71	1,83E-09	1,83
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	146	Cu 63(MR)	0,52	6,0	0,09	3,23	1,39E-09	1,39
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	147	Cu 63(MR)	0,67	2,3	0,12	4,22	1,81E-09	1,81
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	148	Cu 63(MR)	0,72	4,6	0,12	4,52	1,94E-09	1,94
3	10 m	P	1260	277920	23.01.2011	Depth	DGT	149	Cu 63(MR)	0,50	4,9	0,08	3,10	1,33E-09	1,33
4	5	P	1360	176880	23.01.2011	Tank	DGT	150	Cu 63(MR)	0,34	1,1	0,09	2,11	1,42E-09	1,42
4	5	P	1360	176880	23.01.2011	Tank	DGT	151	Cu 63(MR)	1,11	4,3	0,30	6,93	4,68E-09	4,68
4	5	P	1360	277800	23.01.2011	Tank	DGT	152	Cu 63(MR)	0,79	6,3	0,13	4,91	2,11E-09	2,11
4	5	P	1360	277800	23.01.2011	Tank	DGT	153	Cu 63(MR)	0,52	9,5	0,09	3,24	1,39E-09	1,39
4	5	P	1360	277800	23.01.2011	Tank	DGT	154	Cu 63(MR)	0,97	4,3	0,17	6,09	2,62E-09	2,62
4	5	P	1360	277800	23.01.2011	Tank	DGT	155	Cu 63(MR)	0,75	4,9	0,13	4,69	2,02E-09	2,02
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	156	Cu 63(MR)	0,37	3,4	0,10	2,28	1,59E-09	1,59
5	Brk	P	2060	171840	24.01.2011	Depth	DGT	157	Cu 63(MR)	3,28	4,2	0,91	20,52	1,43E-08	14,26
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	158	Cu 63(MR)	0,81	2,7	0,15	5,07	2,36E-09	2,36
5	Brk	P	2060	257220	24.01.2011	Depth	DGT	159	Cu 63(MR)	1,93	6,5	0,36	12,07	5,60E-09	5,60

5	Brk	P	2060	317520	24.01.2011	Depth	DGT	160	Cu 63(MR)	1,20	4,6	0,18	7,49	2,82E-09	2,82
5	Brk	P	2060	317520	24.01.2011	Depth	DGT	161	Cu 63(MR)	6,73	0,3	1,01	42,09	1,58E-08	15,83
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	162	Cu 63(MR)	1,67	7,7	0,46	10,43	7,25E-09	7,25
6	Brk	D	1850	171840	24.01.2011	Depth	DGT	163	Cu 63(MR)	1,16	5,0	0,32	7,25	5,04E-09	5,04
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	164	Cu 63(MR)	1,22	3,0	0,22	7,60	3,53E-09	3,53
6	Brk	D	1850	257220	24.01.2011	Depth	DGT	165	Cu 63(MR)	0,47	2,8	0,09	2,92	1,35E-09	1,35
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	166	Cu 63(MR)	1,02	6,0	0,15	6,39	2,40E-09	2,40
6	Brk	D	1850	318120	24.01.2011	Depth	DGT	167	Cu 63(MR)	0,71	4,1	0,11	4,41	1,66E-09	1,66
7	1	P	2360	250200	26.01.2011	Tank	DGT	168	Cu 63(MR)	3,33	4,5	0,63	20,82	9,93E-09	9,93
7	1	P	2360	250200	26.01.2011	Tank	DGT	169	Cu 63(MR)	2,89	6,9	0,55	18,07	8,63E-09	8,63
7	1	P	2360	250200	26.01.2011	Tank	DGT	170	Cu 63(MR)	7,61	2,9	1,44	47,57	2,27E-08	22,71
8	2	P	2050	250200	26.01.2011	Tank	DGT	171	Cu 63(MR)	1,69	1,9	0,32	10,58	5,05E-09	5,05
8	2	P	2050	250200	26.01.2011	Tank	DGT	172	Cu 63(MR)	1,87	5,8	0,35	11,69	5,58E-09	5,58
8	2	P	2050	250200	26.01.2011	Tank	DGT	173	Cu 63(MR)	0,97	2,3	0,18	6,07	2,90E-09	2,90
9	3	P	1345	250200	26.01.2011	Tank	DGT	174	Cu 63(MR)	2,22	3,1	0,42	13,86	6,61E-09	6,61
9	3	P	1345	250200	26.01.2011	Tank	DGT	175	Cu 63(MR)	0,54	5,5	0,10	3,34	1,60E-09	1,60
9	3	P	1345	250200	26.01.2011	Tank	DGT	176	Cu 63(MR)	1,38	4,5	0,26	8,62	4,12E-09	4,12
10	4	P	1460	250200	26.01.2011	Tank	DGT	177	Cu 63(MR)	0,54	3,6	0,10	3,39	1,62E-09	1,62
10	4	P	1460	250200	26.01.2011	Tank	DGT	178	Cu 63(MR)	0,42	7,1	0,08	2,63	1,26E-09	1,26
10	4	P	1460	250200	26.01.2011	Tank	DGT	179	Cu 63(MR)	0,30	2,8	0,06	1,89	9,04E-10	0,90
11	5	P	1470	250200	26.01.2011	Tank	DGT	180	Cu 63(MR)	2,05	2,5	0,39	12,80	6,11E-09	6,11
11	5	P	1470	250200	26.01.2011	Tank	DGT	181	Cu 63(MR)	1,55	3,5	0,29	9,69	4,63E-09	4,63
11	5	P	1470	250200	26.01.2011	Tank	DGT	182	Cu 63(MR)	1,46	1,6	0,28	9,11	4,35E-09	4,35
12	6	P	2000	252000	27.01.2011	Tank	DGT	183	Cu 63(MR)	0,35	4,6	0,07	2,16	1,02E-09	1,02
12	6	P	2000	252000	27.01.2011	Tank	DGT	184	Cu 63(MR)	0,36	4,1	0,07	2,23	1,05E-09	1,05
12	6	P	2000	252000	27.01.2011	Tank	DGT	185	Cu 63(MR)	0,38	0,8	0,07	2,39	1,13E-09	1,13
13	7	P	2000	252000	27.01.2011	Tank	DGT	186	Cu 63(MR)	0,53	3,9	0,10	3,29	1,56E-09	1,56
13	7	P	2000	252000	27.01.2011	Tank	DGT	187	Cu 63(MR)	0,63	3,7	0,12	3,94	1,87E-09	1,87
13	7	P	2000	252000	27.01.2011	Tank	DGT	188	Cu 63(MR)	0,43	5,0	0,08	2,72	1,29E-09	1,29
14	8	P	1500	252000	27.01.2011	Tank	DGT	189	Cu 63(MR)	0,22	4,5	0,04	1,38	6,55E-10	0,65
14	8	P	1500	252000	27.01.2011	Tank	DGT	190	Cu 63(MR)	4,28	0,9	0,81	26,75	1,27E-08	12,68
14	8	P	1500	252000	27.01.2011	Tank	DGT	191	Cu 63(MR)	0,29	4,4	0,06	1,84	8,72E-10	0,87
15	9	P	1500	252000	27.01.2011	Tank	DGT	192	Cu 63(MR)	0,25	3,9	0,05	1,53	7,27E-10	0,73
15	9	P	1500	252000	27.01.2011	Tank	DGT	193	Cu 63(MR)	0,21	3,1	0,04	1,34	6,33E-10	0,63

15	9	P	1500	252000	27.01.2011	Tank	DGT	194	Cu 63(MR)	0,22	1,0	0,04	1,37	6,50E-10	0,65
16	10	P	2000	283800	27.01.2011	Tank	DGT	195	Cu 63(MR)	0,19	4,9	0,03	1,20	5,06E-10	0,51
16	10	P	2000	283800	27.01.2011	Tank	DGT	196	Cu 63(MR)	0,41	5,6	0,07	2,58	1,09E-09	1,09
16	10	P	2000	283800	27.01.2011	Tank	DGT	197	Cu 63(MR)	0,24	4,3	0,04	1,49	6,26E-10	0,63
17	4	P	2000	405120	29.01.2011	Tank	DGT	198	Cu 63(MR)	0,54	5,2	0,06	3,39	1,00E-09	1,00
17	4	P	2000	405120	29.01.2011	Tank	DGT	199	Cu 63(MR)	1,13	4,1	0,13	7,03	2,07E-09	2,07
18	5	P	2000	405120	29.01.2011	Tank	DGT	200	Cu 63(MR)	1,82	3,3	0,21	11,39	3,36E-09	3,36
18	5	P	2000	405120	29.01.2011	Tank	DGT	201	Cu 63(MR)	0,72	3,4	0,08	4,50	1,33E-09	1,33
19	9	P	1500	313140	30.01.2011	Tank	DGT	202	Cu 63(MR)	0,28	4,0	0,04	1,76	6,70E-10	0,67
19	9	P	1500	313140	30.01.2011	Tank	DGT	203	Cu 63(MR)	1,73	2,2	0,26	10,82	4,13E-09	4,13
20	10	P	1500	312900	30.01.2011	Tank	DGT	204	Cu 63(MR)	0,26	3,7	0,04	1,61	6,15E-10	0,61
20	10	P	1500	312900	30.01.2011	Tank	DGT	205	Cu 63(MR)	3,91	5,8	0,59	24,44	9,33E-09	9,33
21	1	P	2000	253200	04.02.2011	Tank	DGT	206	Cu 63(MR)	0,47	3,2	0,09	2,93	1,38E-09	1,38
21	1	P	2000	253200	04.02.2011	Tank	DGT	207	Cu 63(MR)	0,53	2,6	0,10	3,33	1,57E-09	1,57
21	1	P	2000	253200	04.02.2011	Tank	DGT	208	Cu 63(MR)	0,52	3,3	0,10	3,23	1,52E-09	1,52
22	2	P	2000	252600	04.02.2011	Tank	DGT	209	Cu 63(MR)	0,44	1,3	0,08	2,74	1,30E-09	1,30
22	2	P	2000	252600	04.02.2011	Tank	DGT	210	Cu 63(MR)	0,72	3,1	0,13	4,47	2,12E-09	2,12
22	2	P	2000	252600	04.02.2011	Tank	DGT	211	Cu 63(MR)	0,38	2,3	0,07	2,37	1,12E-09	1,12
23	3	P	2000	252420	04.02.2011	Tank	DGT	212	Cu 63(MR)	0,98	0,6	0,18	6,13	2,90E-09	2,90
23	3	P	2000	252420	04.02.2011	Tank	DGT	213	Cu 63(MR)	0,49	8,1	0,09	3,04	1,44E-09	1,44
23	3	P	2000	252420	04.02.2011	Tank	DGT	214	Cu 63(MR)	0,48	8,3	0,09	2,98	1,41E-09	1,41
24	4	P	1500	252180	04.02.2011	Tank	DGT	215	Cu 63(MR)	1,01	2,6	0,19	6,32	2,99E-09	2,99
24	4	P	1500	252180	04.02.2011	Tank	DGT	216	Cu 63(MR)	1,09	4,3	0,21	6,82	3,23E-09	3,23
24	4	P	1500	252180	04.02.2011	Tank	DGT	217	Cu 63(MR)	2,59	2,4	0,49	16,20	7,67E-09	7,67
25	5	P	1500	252000	04.02.2011	Tank	DGT	218	Cu 63(MR)	0,27	5,1	0,05	1,69	7,99E-10	0,80
25	5	P	1500	252000	04.02.2011	Tank	DGT	219	Cu 63(MR)	0,56	5,1	0,11	3,50	1,66E-09	1,66
25	5	P	1500	252000	04.02.2011	Tank	DGT	220	Cu 63(MR)	0,36	1,8	0,07	2,28	1,08E-09	1,08
26	6	P	1500	426300	05.02.2011	Tank	DGT	221	Cu 63(MR)	0,61	2,2	0,07	3,84	1,08E-09	1,08
26	6	P	1500	426300	05.02.2011	Tank	DGT	222	Cu 63(MR)	0,91	4,5	0,10	5,69	1,59E-09	1,59
26	6	P	1500	426300	05.02.2011	Tank	DGT	223	Cu 63(MR)	0,65	3,8	0,07	4,07	1,14E-09	1,14
27	7	P	1500	426300	05.02.2011	Tank	DGT	224	Cu 63(MR)	0,58	3,8	0,06	3,64	1,02E-09	1,02
27	7	P	1500	426300	05.02.2011	Tank	DGT	225	Cu 63(MR)	0,52	2,0	0,06	3,26	9,14E-10	0,91
27	7	P	1500	426300	05.02.2011	Tank	DGT	226	Cu 63(MR)	0,60	3,1	0,07	3,73	1,05E-09	1,05
28	8	P	1500	426300	05.02.2011	Tank	DGT	227	Cu 63(MR)	0,88	4,3	0,10	5,49	1,54E-09	1,54

28	8	P	1500	426300	05.02.2011	Tank	DGT	228	Cu 63(MR)	0,49	3,6	0,06	3,09	8,65E-10	0,87
28	8	P	1500	426300	05.02.2011	Tank	DGT	229	Cu 63(MR)	0,54	6,1	0,06	3,38	9,47E-10	0,95
29	9	P	1500	426300	05.02.2011	Tank	DGT	230	Cu 63(MR)	0,48	4,3	0,05	3,00	8,40E-10	0,84
29	9	P	1500	426300	05.02.2011	Tank	DGT	231	Cu 63(MR)	0,77	1,5	0,09	4,79	1,34E-09	1,34
29	9	P	1500	426300	05.02.2011	Tank	DGT	232	Cu 63(MR)	0,55	3,1	0,06	3,43	9,61E-10	0,96
30	10	P	1500	426300	05.02.2011	Tank	DGT	233	Cu 63(MR)	0,49	1,8	0,05	3,07	8,61E-10	0,86
30	10	P	1500	426300	05.02.2011	Tank	DGT	234	Cu 63(MR)	0,43	4,7	0,05	2,67	7,49E-10	0,75
30	10	P	1500	426300	05.02.2011	Tank	DGT	235	Cu 63(MR)	0,32	0,8	0,04	1,99	5,57E-10	0,56
31	1	P	1500	259860	13.02.2011	Tank	DGT	236	Cu 63(MR)	0,39	2,8	0,07	2,42	1,11E-09	1,11
31	1	P	1500	259860	13.02.2011	Tank	DGT	237	Cu 63(MR)	0,34	5,4	0,06	2,16	9,91E-10	0,99
31	1	P	1500	259860	13.02.2011	Tank	DGT	238	Cu 63(MR)	0,37	4,5	0,07	2,29	1,05E-09	1,05
32	2	P	1500	259860	13.02.2011	Tank	DGT	239	Cu 63(MR)	0,28	11,6	0,05	1,73	7,96E-10	0,80
32	2	P	1500	259860	13.02.2011	Tank	DGT	240	Cu 63(MR)	0,28	3,5	0,05	1,74	7,99E-10	0,80
32	2	P	1500	259860	13.02.2011	Tank	DGT	241	Cu 63(MR)	0,33	1,3	0,06	2,05	9,42E-10	0,94
33	3	P	2000	259860	13.02.2011	Tank	DGT	242	Cu 63(MR)	0,27	4,3	0,05	1,69	7,78E-10	0,78
33	3	P	2000	259860	13.02.2011	Tank	DGT	243	Cu 63(MR)	0,27	4,5	0,05	1,70	7,81E-10	0,78
33	3	P	2000	259860	13.02.2011	Tank	DGT	244	Cu 63(MR)	0,24	4,0	0,04	1,51	6,92E-10	0,69
34	4	P	2000	259860	13.02.2011	Tank	DGT	245	Cu 63(MR)	0,26	4,3	0,05	1,60	7,37E-10	0,74
34	4	P	2000	259860	13.02.2011	Tank	DGT	246	Cu 63(MR)	0,19	3,5	0,03	1,20	5,49E-10	0,55
34	4	P	2000	259860	13.02.2011	Tank	DGT	247	Cu 63(MR)	0,20	2,4	0,04	1,22	5,61E-10	0,56
35	5	P	2000	259860	13.02.2011	Tank	DGT	248	Cu 63(MR)	0,25	3,4	0,05	1,59	7,32E-10	0,73
35	5	P	2000	259860	13.02.2011	Tank	DGT	249	Cu 63(MR)	0,20	6,6	0,04	1,26	5,79E-10	0,58
35	5	P	2000	259860	13.02.2011	Tank	DGT	250	Cu 63(MR)	0,19	3,1	0,03	1,18	5,44E-10	0,54
36	6	P	1500	256560	14.02.2011	Tank	DGT	251	Cu 63(MR)	0,27	5,9	0,05	1,67	7,78E-10	0,78
36	6	P	1500	256560	14.02.2011	Tank	DGT	252	Cu 63(MR)	0,42	1,7	0,08	2,60	1,21E-09	1,21
36	6	P	1500	256560	14.02.2011	Tank	DGT	253	Cu 63(MR)	0,33	4,4	0,06	2,04	9,51E-10	0,95
37	7	P	1500	256560	14.02.2011	Tank	DGT	254	Cu 63(MR)	0,25	2,7	0,05	1,56	7,28E-10	0,73
37	7	P	1500	256560	14.02.2011	Tank	DGT	255	Cu 63(MR)	0,38	4,2	0,07	2,39	1,11E-09	1,11
37	7	P	1500	256560	14.02.2011	Tank	DGT	256	Cu 63(MR)	0,42	0,5	0,08	2,65	1,23E-09	1,23
38	8	P	1500	256560	14.02.2011	Tank	DGT	257	Cu 63(MR)	0,50	5,8	0,09	3,10	1,44E-09	1,44
38	8	P	1500	256560	14.02.2011	Tank	DGT	258	Cu 63(MR)	0,64	2,2	0,12	4,00	1,86E-09	1,86
38	8	P	1500	256560	14.02.2011	Tank	DGT	259	Cu 63(MR)	0,22	3,0	0,04	1,37	6,39E-10	0,64
39	9	P	2000	255060	14.02.2011	Tank	DGT	260	Cu 63(MR)	0,30	1,4	0,06	1,90	8,90E-10	0,89
39	9	P	2000	255060	14.02.2011	Tank	DGT	261	Cu 63(MR)	0,23	3,9	0,04	1,43	6,71E-10	0,67

39	9	P	2000	255060	14.02.2011	Tank	DGT	262	Cu 63(MR)	0,24	3,9	0,04	1,51	7,06E-10	0,71
40	10	P	2000	255060	14.02.2011	Tank	DGT	263	Cu 63(MR)	0,08	5,6	0,02	0,51	2,40E-10	0,24
40	10	P	2000	255060	14.02.2011	Tank	DGT	264	Cu 63(MR)	0,23	9,1	0,04	1,47	6,87E-10	0,69
40	10	P	2000	255060	14.02.2011	Tank	DGT	265	Cu 63(MR)	-0,01	11,0	0,00	-0,09	-4,00E-11	-0,04
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	266	Cu 63(MR)	0,36	4,5	0,05	2,23	7,95E-10	0,79
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	267	Cu 63(MR)	0,06	2,2	0,01	0,37	1,32E-10	0,13
0	0 m	P	1002	334800	09.02.2011	Depth Profile	DGT	268	Cu 63(MR)	0,17	3,4	0,02	1,06	3,80E-10	0,38
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	269	Cu 63(MR)	0,14	4,8	0,02	0,90	3,22E-10	0,32
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	270	Cu 63(MR)	0,19	8,7	0,03	1,19	4,23E-10	0,42
10	10 m	P	1120	334800	09.02.2011	Depth Profile	DGT	271	Cu 63(MR)	0,16	4,4	0,02	0,98	3,48E-10	0,35
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	272	Cu 63(MR)	0,18	2,1	0,03	1,13	3,96E-10	0,40
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	273	Cu 63(MR)	0,14	3,4	0,02	0,90	3,16E-10	0,32
30	30 m	P	1622	340200	09.02.2011	Depth Profile	DGT	274	Cu 63(MR)	0,18	2,2	0,03	1,15	4,04E-10	0,40
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	275	Cu 63(MR)	0,28	1,0	0,04	1,73	6,08E-10	0,61
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	276	Cu 63(MR)	0,29	3,8	0,04	1,82	6,39E-10	0,64
50	50 m	P	1705	340200	09.02.2011	Depth Profile	DGT	277	Cu 63(MR)	0,27	6,2	0,04	1,69	5,94E-10	0,59
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	278	Cu 63(MR)	0,15	4,8	0,02	0,92	3,23E-10	0,32
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	279	Cu 63(MR)	0,09	3,7	0,01	0,57	2,00E-10	0,20
70	70 m	P	1614	340200	09.02.2011	Depth Profile	DGT	280	Cu 63(MR)	0,15	4,6	0,02	0,95	3,34E-10	0,33
A			920	329400	09.02.2011	River	DGT	281	Cu 63(MR)	0,05	9,2	0,01	0,31	1,13E-10	0,11
A			920	329400	09.02.2011	River	DGT	282	Cu 63(MR)	0,11	1,1	0,02	0,66	2,40E-10	0,24
A			920	329400	09.02.2011	River	DGT	283	Cu 63(MR)	0,04	5,8	0,01	0,26	9,27E-11	0,09
B			750	325800	09.02.2011	River	DGT	284	Cu 63(MR)	0,05	9,5	0,01	0,33	1,22E-10	0,12
B			750	325800	09.02.2011	River	DGT	285	Cu 63(MR)	0,04	5,7	0,01	0,24	8,65E-11	0,09
B			750	325800	09.02.2011	River	DGT	286	Cu 63(MR)	0,02	4,8	0,00	0,13	4,80E-11	0,05

Table C18: Results sheet Total filtration samples; copper

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
4	1	0,2	800	26.01.2011	Filtration	UC-Digest	317	Cu 63(MR)	0,71	3,2	0,0529	8,32E-10	0,832
5	2	0,2	800	26.01.2011	Filtration	UC-Digest	318	Cu 63(MR)	0,85	5,8	0,0639	1,01E-09	1,006
6	3	0,2	600	26.01.2011	Filtration	UC-Digest	319	Cu 63(MR)	0,44	0,8	0,0440	6,92E-10	0,692
7	4	0,2	600	26.01.2011	Filtration	UC-Digest	320	Cu 63(MR)	0,65	4,3	0,0647	1,02E-09	1,019
8	5	0,2	600	26.01.2011	Filtration	UC-Digest	321	Cu 63(MR)	0,31	4,5	0,0310	4,88E-10	0,488
9	6	0,2	600	27.01.2011	Filtration	UC-Digest	322	Cu 63(MR)	0,32	9,3	0,0325	5,11E-10	0,511
10	7	0,2	600	27.01.2011	Filtration	UC-Digest	323	Cu 63(MR)	0,28	7,3	0,0282	4,43E-10	0,443
11	8	0,2	600	27.01.2011	Filtration	UC-Digest	324	Cu 63(MR)	0,48	3,9	0,0480	7,56E-10	0,756
12	9	0,2	600	27.01.2011	Filtration	UC-Digest	325	Cu 63(MR)	0,60	7,4	0,0610	9,60E-10	0,960
13	10	0,2	600	27.01.2011	Filtration	UC-Digest	326	Cu 63(MR)	0,36	3,7	0,0367	5,78E-10	0,578
63	1	0,2	600	01.02.2011	Filtration	UC-Digest	376	Cu 63(MR)	-	-	-	-	-
64	2	0,2	600	01.02.2011	Filtration	UC-Digest	377	Cu 63(MR)	0,37	4,5	0,0377	5,93E-10	0,593
65	3	0,2	600	01.02.2011	Filtration	UC-Digest	378	Cu 63(MR)	0,47	6,0	0,0472	7,44E-10	0,744
66	4	0,2	600	01.02.2011	Filtration	UC-Digest	379	Cu 63(MR)	1,54	3,0	0,1543	2,43E-09	2,428
67	5	0,2	400	01.02.2011	Filtration	UC-Digest	517	Cu 63(MR)	0,49	5,4	0,0739	1,16E-09	1,163
68	6	0,2	600	02.02.2011	Filtration	UC-Digest	381	Cu 63(MR)	0,32	1,7	0,0321	5,05E-10	0,505
69	7	0,2	600	02.02.2011	Filtration	UC-Digest	382	Cu 63(MR)	0,43	5,0	0,0432	6,80E-10	0,680
70	8	0,2	600	02.02.2011	Filtration	UC-Digest	383	Cu 63(MR)	0,36	2,3	0,0358	5,63E-10	0,563
71	9	0,2	400	02.02.2011	Filtration	UC-Digest	384	Cu 63(MR)	0,49	3,1	0,0736	1,16E-09	1,159
72	10	0,2	400	02.02.2011	Filtration	UC-Digest	385	Cu 63(MR)	0,51	3,1	0,0766	1,21E-09	1,206
123	1	0,2	500	07.02.2011	Filtration	UC-Digest	436	Cu 63(MR)	0,23	4,9	0,0272	4,27E-10	0,427
124	2	0,2	500	07.02.2011	Filtration	UC-Digest	437	Cu 63(MR)	0,29	3,5	0,0354	5,57E-10	0,557
125	3	0,2	200	07.02.2011	Filtration	UC-Digest	438	Cu 63(MR)	0,34	1,9	0,1034	1,63E-09	1,628
126	4	0,2	200	07.02.2011	Filtration	UC-Digest	439	Cu 63(MR)	0,43	2,6	0,1299	2,04E-09	2,045
127	5	0,2	200	07.02.2011	Filtration	UC-Digest	440	Cu 63(MR)	0,26	1,4	0,0778	1,22E-09	1,225
128	6	0,2	500	08.02.2011	Filtration	UC-Digest	441	Cu 63(MR)	0,22	2,7	0,0264	4,15E-10	0,415
129	7	0,2	500	08.02.2011	Filtration	UC-Digest	442	Cu 63(MR)	0,55	4,7	0,0660	1,04E-09	1,039
130	8	0,2	300	08.02.2011	Filtration	UC-Digest	443	Cu 63(MR)	0,28	9,7	0,0568	8,94E-10	0,894

131	9	0,2	200	08.02.2011	Filtration	UC-Digest	444	Cu 63(MR)	0,29	3,3	0,0858	1,35E-09	1,350
132	10	0,2	200	08.02.2011	Filtration	UC-Digest	445	Cu 63(MR)	0,24	2,5	0,0730	1,15E-09	1,149
133	1	0,2	500	10.02.2011	Filtration	UC-Digest	446	Cu 63(MR)	0,56	2,1	0,0678	1,07E-09	1,067
134	2	0,2	500	10.02.2011	Filtration	UC-Digest	447	Cu 63(MR)	0,36	3,4	0,0428	6,74E-10	0,674
135	3	0,2	200	10.02.2011	Filtration	UC-Digest	448	Cu 63(MR)	0,26	2,4	0,0793	1,25E-09	1,248
136	4	0,2	200	10.02.2011	Filtration	UC-Digest	449	Cu 63(MR)	0,31	5,3	0,0916	1,44E-09	1,441
137	5	0,2	200	10.02.2011	Filtration	UC-Digest	450	Cu 63(MR)	0,20	5,1	0,0602	9,47E-10	0,947
138	6	0,2	500	11.02.2011	Filtration	UC-Digest	451	Cu 63(MR)	0,30	3,1	0,0364	5,72E-10	0,572
139	7	0,2	500	11.02.2011	Filtration	UC-Digest	452	Cu 63(MR)	0,32	5,6	0,0389	6,13E-10	0,613
140	8	0,2	200	11.02.2011	Filtration	UC-Digest	453	Cu 63(MR)	0,28	3,0	0,0838	1,32E-09	1,319
141	9	0,2	200	11.02.2011	Filtration	UC-Digest	454	Cu 63(MR)	0,28	4,4	0,0826	1,30E-09	1,300
142	10	0,2	200	11.02.2011	Filtration	UC-Digest	455	Cu 63(MR)	0,20	5,8	0,0608	9,57E-10	0,957

Table C19: Results sheet Size fractionation; copper

									Concentration				
									Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Vol (mL)**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**µg.L^{-1}**	**RSD %**	**µg.L^{-1}**	**Mol.L^{-1}**	**nM**
13	1	140	-	29.01.2011	Filtration	UC-Digest	326	Cu 63(MR)	-	-	-	-	-
14	1	20	1960	29.01.2011	Filtration	UC-Digest	327	Cu 63(MR)	0,75	3,6	0,0231	3,63E-10	0,363
15	1	10	600	29.01.2011	Filtration	UC-Digest	328	Cu 63(MR)	0,18	5,3	0,0185	2,90E-10	0,290
16	1	2	600	29.01.2011	Filtration	UC-Digest	329	Cu 63(MR)	0,17	7,6	0,0170	2,67E-10	0,267
17	1	0,2	450	29.01.2011	Filtration	UC-Digest	330	Cu 63(MR)	0,64	2,4	0,0851	1,34E-09	1,339
18	2	140	2100	29.01.2011	Filtration	UC-Digest	331	Cu 63(MR)	0,31	1,5	0,0087	1,37E-10	0,137
19	2	20	2100	29.01.2011	Filtration	UC-Digest	332	Cu 63(MR)	0,47	4,5	0,0134	2,11E-10	0,211
20	2	10	600	29.01.2011	Filtration	UC-Digest	333	Cu 63(MR)	0,09	12,8	0,0095	1,49E-10	0,149
21	2	2	550	29.01.2011	Filtration	UC-Digest	334	Cu 63(MR)	0,27	6,7	0,0290	4,57E-10	0,457
22	2	0,2	500	29.01.2011	Filtration	UC-Digest	335	Cu 63(MR)	0,66	1,0	0,0788	1,24E-09	1,241
23	3	140	2000	29.01.2011	Filtration	UC-Digest	336	Cu 63(MR)	0,23	2,9	0,0069	1,09E-10	0,109
24	3	20	-	29.01.2011	Filtration	UC-Digest	337	Cu 63(MR)	-	-	-	-	-

25	3	10	600	29.01.2011	Filtration	UC-Digest	338	Cu 63(MR)	0,12	6,9	0,0125	1,96E-10	0,196
26	3	2	600	29.01.2011	Filtration	UC-Digest	339	Cu 63(MR)			0,0000	0,00E+00	0,000
27	3	0,2	450	29.01.2011	Filtration	UC-Digest	340	Cu 63(MR)	0,23	3,7	0,0303	4,76E-10	0,476
28	4	140	2000	29.01.2011	Filtration	UC-Digest	341	Cu 63(MR)	0,30	7,4	0,0090	1,41E-10	0,141
29	4	20	2000	29.01.2011	Filtration	UC-Digest	342	Cu 63(MR)	0,69	2,1	0,0208	3,27E-10	0,327
30	4	10	600	29.01.2011	Filtration	UC-Digest	343	Cu 63(MR)	0,06	5,5	0,0057	8,99E-11	0,090
31	4	2	600	29.01.2011	Filtration	UC-Digest	344	Cu 63(MR)	0,13	8,8	0,0126	1,99E-10	0,199
32	4	0,2	450	29.01.2011	Filtration	UC-Digest	345	Cu 63(MR)	0,70	4,2	0,0936	1,47E-09	1,473
33	5	140	2000	29.01.2011	Filtration	UC-Digest	346	Cu 63(MR)	1,00	14,2	0,0301	4,73E-10	0,473
34	5	20	2000	29.01.2011	Filtration	UC-Digest	347	Cu 63(MR)	0,76	7,2	0,0227	3,57E-10	0,357
35	5	10	600	29.01.2011	Filtration	UC-Digest	348	Cu 63(MR)	0,09	16,8	0,0092	1,45E-10	0,145
36	5	2	600	29.01.2011	Filtration	UC-Digest	349	Cu 63(MR)	0,22	2,6	0,0222	3,49E-10	0,349
37	5	0,2	450	29.01.2011	Filtration	UC-Digest	350	Cu 63(MR)	0,33	0,8	0,0440	6,93E-10	0,693
38	6	140	2000	30.01.2011	Filtration	UC-Digest	351	Cu 63(MR)	0,28	12,8	0,0084	1,32E-10	0,132
39	6	20	2000	30.01.2011	Filtration	UC-Digest	352	Cu 63(MR)	0,38	6,1	0,0114	1,79E-10	0,179
40	6	10	550	30.01.2011	Filtration	UC-Digest	353	Cu 63(MR)	0,14	3,5	0,0155	2,44E-10	0,244
41	6	2	550	30.01.2011	Filtration	UC-Digest	354	Cu 63(MR)	0,06	23,1	0,0067	1,05E-10	0,105
42	6	0,2	450	30.01.2011	Filtration	UC-Digest	355	Cu 63(MR)	0,37	5,7	0,0491	7,73E-10	0,773
43	7	140	2000	30.01.2011	Filtration	UC-Digest	356	Cu 63(MR)	0,34	7,4	0,0102	1,60E-10	0,160
44	7	20	2000	30.01.2011	Filtration	UC-Digest	357	Cu 63(MR)	1,05	7,3	0,0316	4,97E-10	0,497
45	7	10	350	30.01.2011	Filtration	UC-Digest	358	Cu 63(MR)	0,22	9,2	0,0383	6,03E-10	0,603
46	7	2	350	30.01.2011	Filtration	UC-Digest	359	Cu 63(MR)	0,11	6,9	0,0190	2,98E-10	0,298
47	7	0,2	350	30.01.2011	Filtration	UC-Digest	360	Cu 63(MR)	0,28	10,3	0,0486	7,64E-10	0,764
48	8	140	2000	30.01.2011	Filtration	UC-Digest	361	Cu 63(MR)	0,78	0,8	0,0234	3,69E-10	0,369
49	8	20	2000	30.01.2011	Filtration	UC-Digest	362	Cu 63(MR)	1,12	2,4	0,0336	5,29E-10	0,529
50	8	10	600	30.01.2011	Filtration	UC-Digest	363	Cu 63(MR)	0,47	2,6	0,0472	7,43E-10	0,743
51	8	2	400	30.01.2011	Filtration	UC-Digest	364	Cu 63(MR)	0,21	3,7	0,0319	5,01E-10	0,501
52	8	0,2	400	30.01.2011	Filtration	UC-Digest	516	Cu 63(MR)	0,46	2,5	0,0685	1,08E-09	1,078
53	9	140	2000	30.01.2011	Filtration	UC-Digest	366	Cu 63(MR)	1,31	1,0	0,0394	6,20E-10	0,620
54	9	20	2000	30.01.2011	Filtration	UC-Digest	367	Cu 63(MR)	0,76	2,3	0,0228	3,59E-10	0,359
55	9	10	600	30.01.2011	Filtration	UC-Digest	368	Cu 63(MR)	0,17	8,9	0,0175	2,75E-10	0,275
56	9	2	400	30.01.2011	Filtration	UC-Digest	369	Cu 63(MR)	0,34	7,2	0,0510	8,03E-10	0,803
57	9	0,2	400	30.01.2011	Filtration	UC-Digest	370	Cu 63(MR)	0,49	2,3	0,0732	1,15E-09	1,152
58	10	140	2000	30.01.2011	Filtration	UC-Digest	371	Cu 63(MR)	0,05	8,0	0,0014	2,28E-11	0,023

59	10	20	2000	30.01.2011	Filtration	UC-Digest	372	Cu 63(MR)	0,63	1,7	0,0190	3,00E-10	0,300
60	10	10	600	30.01.2011	Filtration	UC-Digest	373	Cu 63(MR)	0,11	7,4	0,0110	1,73E-10	0,173
61	10	2	375	30.01.2011	Filtration	UC-Digest	374	Cu 63(MR)	0,16	5,2	0,0253	3,99E-10	0,399
62	10	0,2	375	30.01.2011	Filtration	UC-Digest	375	Cu 63(MR)	0,23	14,4	0,0370	5,82E-10	0,582
73	1	140	2000	04.02.2011	Filtration	UC-Digest	386	Cu 63(MR)	0,20	4,7	0,0061	9,61E-11	0,096
74	1	20	2000	04.02.2011	Filtration	UC-Digest	387	Cu 63(MR)	0,49	1,9	0,0146	2,30E-10	0,230
75	1	10	600	04.02.2011	Filtration	UC-Digest	388	Cu 63(MR)	0,04	14,2	0,0041	6,45E-11	0,065
76	1	2	600	04.02.2011	Filtration	UC-Digest	389	Cu 63(MR)	0,25	4,6	0,0248	3,91E-10	0,391
77	1	0,2	600	04.02.2011	Filtration	UC-Digest	390	Cu 63(MR)	0,11	3,9	0,0112	1,76E-10	0,176
78	2	140	2000	04.02.2011	Filtration	UC-Digest	391	Cu 63(MR)	0,25	1,5	0,0075	1,19E-10	0,119
79	2	20	2000	04.02.2011	Filtration	UC-Digest	392	Cu 63(MR)	0,38	2,0	0,0113	1,78E-10	0,178
80	2	10	600	04.02.2011	Filtration	UC-Digest	393	Cu 63(MR)	0,31	3,7	0,0313	4,93E-10	0,493
81	2	2	550	04.02.2011	Filtration	UC-Digest	394	Cu 63(MR)	0,74	2,2	0,0806	1,27E-09	1,269
82	2	0,2	500	04.02.2011	Filtration	UC-Digest	395	Cu 63(MR)	0,14	2,4	0,0164	2,58E-10	0,258
83	3	140	2000	04.02.2011	Filtration	UC-Digest	396	Cu 63(MR)	1,20	2,0	0,0360	5,66E-10	0,566
84	3	20	2000	04.02.2011	Filtration	UC-Digest	397	Cu 63(MR)	1,62	5,1	0,0487	7,66E-10	0,766
85	3	10	2000	04.02.2011	Filtration	UC-Digest	398	Cu 63(MR)	0,19	4,7	0,0057	9,00E-11	0,090
86	3	2	300	04.02.2011	Filtration	UC-Digest	399	Cu 63(MR)	0,13	8,7	0,0255	4,01E-10	0,401
87	3	0,2	300	04.02.2011	Filtration	UC-Digest	400	Cu 63(MR)	0,11	7,3	0,0224	3,53E-10	0,353
88	4	140	2000	04.02.2011	Filtration	UC-Digest	401	Cu 63(MR)	1,58	2,4	0,0475	7,47E-10	0,747
89	4	20	1000	04.02.2011	Filtration	UC-Digest	402	Cu 63(MR)	0,98	1,9	0,0587	9,24E-10	0,924
90	4	10	350	04.02.2011	Filtration	UC-Digest	403	Cu 63(MR)	0,21	1,2	0,0362	5,70E-10	0,570
91	4	2	300	04.02.2011	Filtration	UC-Digest	404	Cu 63(MR)	0,23	1,5	0,0457	7,19E-10	0,719
92	4	0,2	300	04.02.2011	Filtration	UC-Digest	405	Cu 63(MR)	0,23	3,2	0,0469	7,38E-10	0,738
93	5	140	1000	04.02.2011	Filtration	UC-Digest	406	Cu 63(MR)	0,81	4,3	0,0487	7,66E-10	0,766
94	5	20	1000	04.02.2011	Filtration	UC-Digest	407	Cu 63(MR)	0,54	2,9	0,0322	5,07E-10	0,507
95	5	10	250	04.02.2011	Filtration	UC-Digest	408	Cu 63(MR)	0,35	3,4	0,0851	1,34E-09	1,340
96	5	2	200	04.02.2011	Filtration	UC-Digest	409	Cu 63(MR)	0,74	4,6	0,2231	3,51E-09	3,511
97	5	0,2	200	04.02.2011	Filtration	UC-Digest	410	Cu 63(MR)	0,31	6,7	0,0935	1,47E-09	1,471
98	6	140	2000	05.02.2011	Filtration	UC-Digest	411	Cu 63(MR)	0,23	2,0	0,0068	1,08E-10	0,108
99	6	20	2000	05.02.2011	Filtration	UC-Digest	412	Cu 63(MR)	0,93	0,1	0,0278	4,38E-10	0,438
100	6	10	600	05.02.2011	Filtration	UC-Digest	413	Cu 63(MR)	0,00	22,9	0,0002	3,61E-12	0,004
101	6	2	400	05.02.2011	Filtration	UC-Digest	414	Cu 63(MR)	0,16	3,1	0,0247	3,89E-10	0,389
102	6	0,2	200	05.02.2011	Filtration	UC-Digest	415	Cu 63(MR)	0,43	2,2	0,1292	2,03E-09	2,033

103	7	140	2000	05.02.2011	Filtration	UC-Digest	416	Cu 63(MR)	0,44	8,1	0,0131	2,06E-10	0,206
104	7	20	1000	05.02.2011	Filtration	UC-Digest	417	Cu 63(MR)	0,22	3,3	0,0130	2,04E-10	0,204
105	7	10	400	05.02.2011	Filtration	UC-Digest	418	Cu 63(MR)	0,23	0,5	0,0356	5,60E-10	0,560
106	7	2	300	05.02.2011	Filtration	UC-Digest	419	Cu 63(MR)	0,11	6,6	0,0216	3,40E-10	0,340
107	7	0,2	200	05.02.2011	Filtration	UC-Digest	420	Cu 63(MR)	1,30	2,8	0,3896	6,13E-09	6,131
108	8	140	2000	05.02.2011	Filtration	UC-Digest	421	Cu 63(MR)	0,71	1,5	0,0212	3,34E-10	0,334
109	8	20	1000	05.02.2011	Filtration	UC-Digest	422	Cu 63(MR)	0,66	1,1	0,0395	6,22E-10	0,622
110	8	10	350	05.02.2011	Filtration	UC-Digest	423	Cu 63(MR)	0,35	4,3	0,0599	9,43E-10	0,943
111	8	2	200	05.02.2011	Filtration	UC-Digest	424	Cu 63(MR)	0,09	6,2	0,0274	4,32E-10	0,432
112	8	0,2	200	05.02.2011	Filtration	UC-Digest	425	Cu 63(MR)	0,21	5,7	0,0620	9,75E-10	0,975
113	9	140	2000	05.02.2011	Filtration	UC-Digest	426	Cu 63(MR)	1,34	2,2	0,0403	6,34E-10	0,634
114	9	20	1000	05.02.2011	Filtration	UC-Digest	427	Cu 63(MR)	0,66	2,9	0,0397	6,24E-10	0,624
115	9	10	350	05.02.2011	Filtration	UC-Digest	428	Cu 63(MR)	0,07	7,8	0,0118	1,85E-10	0,185
116	9	2	200	05.02.2011	Filtration	UC-Digest	429	Cu 63(MR)	0,07	2,0	0,0202	3,19E-10	0,319
117	9	0,2	200	05.02.2011	Filtration	UC-Digest	430	Cu 63(MR)	0,16	3,6	0,0486	7,65E-10	0,765
118	10	140	1000	05.02.2011	Filtration	UC-Digest	431	Cu 63(MR)	2,90	2,8	0,1782	2,80E-09	2,804
119	10	20	500	05.02.2011	Filtration	UC-Digest	432	Cu 63(MR)	0,51	3,2	0,0616	9,70E-10	0,970
120	10	10	350	05.02.2011	Filtration	UC-Digest	433	Cu 63(MR)	0,17	2,4	0,0288	4,53E-10	0,453
121	10	2	200	05.02.2011	Filtration	UC-Digest	434	Cu 63(MR)	0,11	12,7	0,0340	5,35E-10	0,535
122	10	0,2	120	05.02.2011	Filtration	UC-Digest	435	Cu 63(MR)	0,19	3,2	0,0954	1,50E-09	1,501
143	1	140	2000	13.02.2011	Filtration	UC-Digest	456	Cu 63(MR)	0,17	3,8	0,0052	8,17E-11	0,082
144	1	20	2000	13.02.2011	Filtration	UC-Digest	457	Cu 63(MR)	0,30	8,5	0,0089	1,40E-10	0,140
145	1	10	600	13.02.2011	Filtration	UC-Digest	458	Cu 63(MR)	0,06	8,1	0,0061	9,59E-11	0,096
146	1	2	400	13.02.2011	Filtration	UC-Digest	459	Cu 63(MR)	0,07	12,3	0,0105	1,65E-10	0,165
147	1	0,2	400	13.02.2011	Filtration	UC-Digest	460	Cu 63(MR)	0,23	2,2	0,0344	5,42E-10	0,542
148	2	140	2000	13.02.2011	Filtration	UC-Digest	461	Cu 63(MR)	0,62	0,8	0,0186	2,92E-10	0,292
149	2	20	2000	13.02.2011	Filtration	UC-Digest	462	Cu 63(MR)	0,56	6,0	0,0169	2,65E-10	0,265
150	2	10	400	13.02.2011	Filtration	UC-Digest	463	Cu 63(MR)	0,07	10,7	0,0101	1,59E-10	0,159
151	2	2	300	13.02.2011	Filtration	UC-Digest	464	Cu 63(MR)	0,06	9,5	0,0115	1,81E-10	0,181
152	2	0,2	200	13.02.2011	Filtration	UC-Digest	465	Cu 63(MR)	0,10	6,1	0,0313	4,93E-10	0,493
153	3	140	2000	13.02.2011	Filtration	UC-Digest	466	Cu 63(MR)	2,69	1,8	0,0807	1,27E-09	1,270
154	3	20	1000	13.02.2011	Filtration	UC-Digest	467	Cu 63(MR)	1,10	0,2	0,0660	1,04E-09	1,039
155	3	10	250	13.02.2011	Filtration	UC-Digest	468	Cu 63(MR)	0,12	5,2	0,0279	4,39E-10	0,439
156	3	2	150	13.02.2011	Filtration	UC-Digest	469	Cu 63(MR)	0,07	8,8	0,0278	4,38E-10	0,438

157	3	0,2	150	13.02.2011	Filtration	UC-Digest	470	Cu 63(MR)	0,15	3,2	0,0615	9,68E-10	0,968
158	4	140	2000	13.02.2011	Filtration	UC-Digest	471	Cu 63(MR)	0,86	2,5	0,0259	4,08E-10	0,408
159	4	20	1000	13.02.2011	Filtration	UC-Digest	472	Cu 63(MR)	0,45	3,0	0,0271	4,27E-10	0,427
160	4	10	250	13.02.2011	Filtration	UC-Digest	473	Cu 63(MR)	0,05	4,9	0,0115	1,80E-10	0,180
161	4	2	250	13.02.2011	Filtration	UC-Digest	474	Cu 63(MR)	0,06	4,6	0,0152	2,39E-10	0,239
162	4	0,2	200	13.02.2011	Filtration	UC-Digest	475	Cu 63(MR)	0,16	6,0	0,0485	7,63E-10	0,763
163	5	140	2000	13.02.2011	Filtration	UC-Digest	476	Cu 63(MR)	0,61	2,1	0,0182	2,87E-10	0,287
164	5	20	500	13.02.2011	Filtration	UC-Digest	477	Cu 63(MR)	0,57	1,6	0,0689	1,08E-09	1,085
165	5	10	200	13.02.2011	Filtration	UC-Digest	478	Cu 63(MR)	0,13	2,0	0,0383	6,02E-10	0,602
166	5	2	200	13.02.2011	Filtration	UC-Digest	479	Cu 63(MR)	0,10	5,5	0,0286	4,50E-10	0,450
167	5	0,2	200	13.02.2011	Filtration	UC-Digest	480	Cu 63(MR)	0,24	2,0	0,0730	1,15E-09	1,149
168	6	140	2000	14.02.2011	Filtration	UC-Digest	481	Cu 63(MR)	0,16	4,9	0,0047	7,39E-11	0,074
169	6	20	1000	14.02.2011	Filtration	UC-Digest	482	Cu 63(MR)	0,20	6,4	0,0118	1,86E-10	0,186
170	6	10	500	14.02.2011	Filtration	UC-Digest	483	Cu 63(MR)	0,06	4,5	0,0070	1,10E-10	0,110
171	6	2	300	14.02.2011	Filtration	UC-Digest	484	Cu 63(MR)	0,08	7,4	0,0168	2,65E-10	0,265
172	6	0,2	300	14.02.2011	Filtration	UC-Digest	485	Cu 63(MR)	0,20	2,1	0,0409	6,44E-10	0,644
173	7	140	2000	14.02.2011	Filtration	UC-Digest	486	Cu 63(MR)	0,24	8,6	0,0073	1,15E-10	0,115
174	7	20	1000	14.02.2011	Filtration	UC-Digest	487	Cu 63(MR)	0,33	3,4	0,0196	3,09E-10	0,309
175	7	10	395	14.02.2011	Filtration	UC-Digest	488	Cu 63(MR)	0,13	4,3	0,0203	3,19E-10	0,319
176	7	2	200	14.02.2011	Filtration	UC-Digest	489	Cu 63(MR)	0,11	9,1	0,0338	5,32E-10	0,532
177	7	0,2	200	14.02.2011	Filtration	UC-Digest	490	Cu 63(MR)	0,26	1,8	0,0769	1,21E-09	1,210
178	8	140	2000	14.02.2011	Filtration	UC-Digest	491	Cu 63(MR)	0,46	1,9	0,0139	2,18E-10	0,218
179	8	20	1000	14.02.2011	Filtration	UC-Digest	492	Cu 63(MR)	0,60	2,4	0,0362	5,70E-10	0,570
180	8	10	300	14.02.2011	Filtration	UC-Digest	493	Cu 63(MR)	0,15	4,0	0,0308	4,85E-10	0,485
181	8	2	100	14.02.2011	Filtration	UC-Digest	494	Cu 63(MR)	0,16	5,0	0,0943	1,48E-09	1,484
182	8	0,2	200	14.02.2011	Filtration	UC-Digest	495	Cu 63(MR)	0,35	5,1	0,1057	1,66E-09	1,664
183	9	140	2000	14.02.2011	Filtration	UC-Digest	496	Cu 63(MR)	1,57	2,6	0,0472	7,42E-10	0,742
184	9	20	1000	14.02.2011	Filtration	UC-Digest	497	Cu 63(MR)	0,77	4,3	0,0460	7,24E-10	0,724
185	9	10	150	14.02.2011	Filtration	UC-Digest	498	Cu 63(MR)	0,14	4,4	0,0566	8,90E-10	0,890
186	9	2	150	14.02.2011	Filtration	UC-Digest	499	Cu 63(MR)	-	-	-	-	-
187	9	0,2	150	14.02.2011	Filtration	UC-Digest	500	Cu 63(MR)	0,18	13,0	0,0721	1,13E-09	1,135
188	10	140	1500	14.02.2011	Filtration	UC-Digest	501	Cu 63(MR)	0,32	4,1	0,0128	2,02E-10	0,202
189	10	20	500	14.02.2011	Filtration	UC-Digest	502	Cu 63(MR)	0,48	5,3	0,0571	8,98E-10	0,898
190	10	10	130	14.02.2011	Filtration	UC-Digest	503	Cu 63(MR)	0,14	5,3	0,0649	1,02E-09	1,022

191	10	2	55	14.02.2011	Filtration	UC-Digest	504	Cu 63(MR)	0,18	5,3	0,1976	3,11E-09	3,111
192	10	0,2	55	14.02.2011	Filtration	UC-Digest	505	Cu 63(MR)	0,30	3,6	0,3325	5,23E-09	5,234

Table C20: Results sheet Direct samples; copper

								Concentration				
								Uncorrected		**Corrected**		
Smpl	**Tank/Depth**	**Fract**	**Date**	**Type of sample**	**Method**	**Project-Inr**	**Element**	**$\mu g.L^{-1}$**	**RSD %**	**$\mu g.L^{-1}$**	**$Mol.L^{-1}$**	**nM**
1	10 m	P	23.01.2011	Depth	Direct	529	Cu 63(MR)	0,533	4,8	5,33E-03	8,38E-11	0,084
1	10 m	P	23.01.2011	Depth	Direct	529	Cu 63(MR)	0,470	6,9	4,70E-03	7,39E-11	0,074
3	10 m	D	23.01.2011	Depth	Direct	530	Cu 63(MR)	0,193	2,7	1,93E-03	3,04E-11	0,030
5	5	P	23.01.2011	Tank	Direct	531	Cu 63(MR)	0,182	8,5	1,82E-03	2,85E-11	0,029
7	5	D	23.01.2011	Tank	Direct	532	Cu 63(MR)	0,130	3,0	1,30E-03	2,05E-11	0,021
9	Brk	P	24.01.2011	Depth	Direct	533	Cu 63(MR)	0,102	1,6	1,02E-03	1,60E-11	0,016
11	Brk	D	24.01.2011	Depth	Direct	534	Cu 63(MR)	0,079	6,1	7,86E-04	1,24E-11	0,012
13	1	P	26.01.2011	Tank	Direct	535	Cu 63(MR)	0,067	7,7	6,73E-04	1,06E-11	0,011
15	1	D	26.01.2011	Tank	Direct	536	Cu 63(MR)	0,109	3,0	1,09E-03	1,72E-11	0,017
17	2	P	26.01.2011	Tank	Direct	537	Cu 63(MR)	0,197	5,3	1,97E-03	3,10E-11	0,031
19	2	D	26.01.2011	Tank	Direct	538	Cu 63(MR)	0,054	3,0	5,37E-04	8,45E-12	0,008
21	3	P	26.01.2011	Tank	Direct	539	Cu 63(MR)	0,011	26,1	1,13E-04	1,77E-12	0,002
23	3	D	26.01.2011	Tank	Direct	540	Cu 63(MR)	0,088	16,7	8,77E-04	1,38E-11	0,014
23	3	D	23.01.2011	Tank	Direct		Cu 63(MR)	0,034	6,4	3,38E-04	5,32E-12	0,005
25	4	P	26.01.2011	Tank	Direct	541	Cu 63(MR)	0,037	6,0	3,67E-04	5,77E-12	0,006
27	4	D	26.01.2011	Tank	Direct	542	Cu 63(MR)	0,040	7,6	4,02E-04	6,32E-12	0,006
29	5	P	26.01.2011	Tank	Direct	543	Cu 63(MR)	0,039	8,2	3,93E-04	6,18E-12	0,006
31	5	D	26.01.2011	Tank	Direct	544	Cu 63(MR)	0,055	11,6	5,50E-04	8,65E-12	0,009
33	6	P	27.01.2011	Tank	Direct	545	Cu 63(MR)	0,020	15,8	1,99E-04	3,13E-12	0,003

35	6	D	27.01.2011	Tank	Direct	546	Cu 63(MR)	0,048	14,8	4,76E-04	7,49E-12	0,007
37	7	P	27.01.2011	Tank	Direct	547	Cu 63(MR)	0,029	8,2	2,89E-04	4,54E-12	0,005
39	7	D	27.01.2011	Tank	Direct	548	Cu 63(MR)	0,028	20,0	2,83E-04	4,46E-12	0,004
41	8	P	27.01.2011	Tank	Direct	549	Cu 63(MR)	0,024	7,7	2,40E-04	3,78E-12	0,004
43	8	D	27.01.2011	Tank	Direct	550	Cu 63(MR)	0,022	7,5	2,21E-04	3,47E-12	0,003
45	9	P	27.01.2011	Tank	Direct	551	Cu 63(MR)	0,015	3,3	1,49E-04	2,35E-12	0,002
47	9	D	27.01.2011	Tank	Direct	552	Cu 63(MR)	0,015	12,7	1,54E-04	2,43E-12	0,002
49	10	P	27.01.2011	Tank	Direct	553	Cu 63(MR)	0,008	12,6	7,78E-05	1,22E-12	0,001
51	10	D	27.01.2011	Tank	Direct	554	Cu 63(MR)	0,008	5,3	8,46E-05	1,33E-12	0,001
53	1	P	29.01.2011	Tank	Direct	555	Cu 63(MR)	0,035	14,6	3,52E-04	5,54E-12	0,006
55	1	D	29.01.2011	Tank	Direct	556	Cu 63(MR)	0,027	9,8	2,68E-04	4,21E-12	0,004
57	2	P	29.01.2011	Tank	Direct	557	Cu 63(MR)	0,007	6,2	7,32E-05	1,15E-12	0,001
59	2	D	29.01.2011	Tank	Direct	558	Cu 63(MR)	0,029	6,0	2,88E-04	4,53E-12	0,005
61	3	P	29.01.2011	Tank	Direct	559	Cu 63(MR)	0,007	11,0	7,26E-05	1,14E-12	0,001
63	3	D	29.01.2011	Tank	Direct	560	Cu 63(MR)	0,005	1,4	5,34E-05	8,40E-13	0,001
65	4	P	29.01.2011	Tank	Direct	561	Cu 63(MR)	0,034	16,2	3,45E-04	5,42E-12	0,005
67	4	D	29.01.2011	Tank	Direct	562	Cu 63(MR)	0,034	2,9	3,36E-04	5,28E-12	0,005
69	5	P	29.01.2011	Tank	Direct	563	Cu 63(MR)	0,029	5,7	2,92E-04	4,60E-12	0,005
71	5	D	29.01.2011	Tank	Direct	564	Cu 63(MR)	0,033	9,6	3,27E-04	5,14E-12	0,005
73	6	P	30.01.2011	Tank	Direct	565	Cu 63(MR)	0,016	6,8	1,61E-04	2,53E-12	0,003
75	6	D	30.01.2011	Tank	Direct	566	Cu 63(MR)	0,039	2,6	3,95E-04	6,21E-12	0,006
77	7	P	30.01.2011	Tank	Direct	567	Cu 63(MR)	0,126	4,1	1,26E-03	1,98E-11	0,020
79	7	D	30.01.2011	Tank	Direct	568	Cu 63(MR)	0,026	14,0	2,59E-04	4,08E-12	0,004
81	8	P	30.01.2011	Tank	Direct	569	Cu 63(MR)	0,016	9,5	1,59E-04	2,50E-12	0,003
83	8	D	30.01.2011	Tank	Direct	570	Cu 63(MR)	0,051	3,4	5,14E-04	8,08E-12	0,008
85	9	P	30.01.2011	Tank	Direct	571	Cu 63(MR)	0,033	4,8	3,26E-04	5,12E-12	0,005
87	9	D	30.01.2011	Tank	Direct	572	Cu 63(MR)	0,032	3,7	3,20E-04	5,04E-12	0,005
89	10	P	30.01.2011	Tank	Direct	573	Cu 63(MR)	0,049	8,8	4,86E-04	7,64E-12	0,008
91	10	D	30.01.2011	Tank	Direct	574	Cu 63(MR)	0,039	3,9	3,93E-04	6,17E-12	0,006

93	1	P	01.02.2011	Tank	Direct	575	Cu 63(MR)	0,067	1,1	6,72E-04	1,06E-11	0,011
95	1	D	01.02.2011	Tank	Direct	576	Cu 63(MR)	0,032	1,7	3,17E-04	4,98E-12	0,005
97	2	P	01.02.2011	Tank	Direct	577	Cu 63(MR)	0,014	4,0	1,41E-04	2,22E-12	0,002
99	2	D	01.02.2011	Tank	Direct	578	Cu 63(MR)	0,022	6,2	2,24E-04	3,52E-12	0,004
101	3	P	01.02.2011	Tank	Direct	579	Cu 63(MR)	0,056	14,3	5,63E-04	8,85E-12	0,009
103	3	D	01.02.2011	Tank	Direct	580	Cu 63(MR)	0,036	1,6	3,56E-04	5,59E-12	0,006
105	4	P	01.02.2011	Tank	Direct	581	Cu 63(MR)	0,062	0,3	6,18E-04	9,72E-12	0,010
107	4	D	01.02.2011	Tank	Direct	582	Cu 63(MR)	0,022	8,2	2,24E-04	3,53E-12	0,004
109	5	P	01.02.2011	Tank	Direct	583	Cu 63(MR)	0,043	11,0	4,27E-04	6,72E-12	0,007
111	5	D	01.02.2011	Tank	Direct	584	Cu 63(MR)	0,021	4,6	2,11E-04	3,31E-12	0,003
113	6	P	02.02.2011	Tank	Direct	585	Cu 63(MR)	0,046	9,2	4,56E-04	7,17E-12	0,007
115	6	D	02.02.2011	Tank	Direct	586	Cu 63(MR)	0,066	4,8	6,60E-04	1,04E-11	0,010
117	7	P	02.02.2011	Tank	Direct	587	Cu 63(MR)	0,022	5,1	2,18E-04	3,43E-12	0,003
119	7	D	02.02.2011	Tank	Direct	588	Cu 63(MR)	0,030	1,6	3,04E-04	4,78E-12	0,005
121	8	P	02.02.2011	Tank	Direct	589	Cu 63(MR)	0,037	6,9	3,74E-04	5,88E-12	0,006
123	8	D	02.02.2011	Tank	Direct	590	Cu 63(MR)	0,062	8,8	6,16E-04	9,68E-12	0,010
125	9	P	02.02.2011	Tank	Direct	591	Cu 63(MR)	0,000	13,2	-2,91E-06	-4,58E-14	0,000
127	9	D	02.02.2011	Tank	Direct	592	Cu 63(MR)	0,032	6,4	3,22E-04	5,07E-12	0,005
129	10	P	02.02.2011	Tank	Direct	593	Cu 63(MR)	0,057	6,8	5,74E-04	9,03E-12	0,009
131	10	D	02.02.2011	Tank	Direct	594	Cu 63(MR)	0,019	14,0	1,88E-04	2,95E-12	0,003
133	1	P	04.02.2011	Tank	Direct	595	Cu 63(MR)	0,042	9,9	4,17E-04	6,56E-12	0,007
135	1	D	04.02.2011	Tank	Direct	596	Cu 63(MR)	-0,017	17,9	-1,68E-04	-2,64E-12	-0,003
137	2	P	04.02.2011	Tank	Direct	597	Cu 63(MR)	0,028	12,2	2,84E-04	4,47E-12	0,004
139	2	D	04.02.2011	Tank	Direct	598	Cu 63(MR)	0,006	7,8	6,19E-05	9,74E-13	0,001
141	3	P	04.02.2011	Tank	Direct	599	Cu 63(MR)	0,026	13,4	2,61E-04	4,11E-12	0,004
143	3	D	04.02.2011	Tank	Direct	600	Cu 63(MR)	0,013	17,3	1,25E-04	1,97E-12	0,002
145	4	P	04.02.2011	Tank	Direct	601	Cu 63(MR)	-0,008	12,8	-7,73E-05	-1,21E-12	-0,001
147	4	D	04.02.2011	Tank	Direct	602	Cu 63(MR)	0,157	10,7	1,57E-03	2,47E-11	0,025
149	5	P	04.02.2011	Tank	Direct	603	Cu 63(MR)	0,079	11,5	7,87E-04	1,24E-11	0,012

151	5	D	04.02.2011	Tank	Direct	604	Cu 63(MR)	-0,023	4,8	-2,27E-04	-3,56E-12	-0,004
153	6	P	05.02.2011	Tank	Direct	605	Cu 63(MR)	0,073	14,6	7,29E-04	1,15E-11	0,011
154	6	D	05.02.2011	Tank	Direct	606	Cu 63(MR)	0,070	16,5	7,00E-04	1,10E-11	0,011
155	7	P	05.02.2011	Tank	Direct	607	Cu 63(MR)	0,029	12,1	2,89E-04	4,54E-12	0,005
156	7	D	05.02.2011	Tank	Direct	608	Cu 63(MR)	-0,009	10,7	-8,71E-05	-1,37E-12	-0,001
157	8	P	05.02.2011	Tank	Direct	609	Cu 63(MR)	0,018	11,3	1,82E-04	2,87E-12	0,003
158	8	D	05.02.2011	Tank	Direct	610	Cu 63(MR)	0,021	6,5	2,06E-04	3,24E-12	0,003
159	9	P	05.02.2011	Tank	Direct	611	Cu 63(MR)	0,049	7,9	4,87E-04	7,66E-12	0,008
160	9	D	05.02.2011	Tank	Direct	612	Cu 63(MR)	0,028	8,4	2,82E-04	4,43E-12	0,004
161	10	P	05.02.2011	Tank	Direct	613	Cu 63(MR)	0,386	3,3	3,86E-03	6,07E-11	0,061
162	10	D	05.02.2011	Tank	Direct	614	Cu 63(MR)	0,019	17,0	1,95E-04	3,07E-12	0,003
163	1	P	07.02.2011	Tank	Direct	615	Cu 63(MR)	0,024	13,5	2,41E-04	3,80E-12	0,004
164	1	D	07.02.2011	Tank	Direct	616	Cu 63(MR)	0,101	4,2	1,01E-03	1,58E-11	0,016
165	2	P	07.02.2011	Tank	Direct	617	Cu 63(MR)	0,050	5,4	5,04E-04	7,93E-12	0,008
166	2	D	07.02.2011	Tank	Direct	618	Cu 63(MR)	0,074	7,6	7,37E-04	1,16E-11	0,012
167	3	P	07.02.2011	Tank	Direct	619	Cu 63(MR)	0,030	8,3	2,97E-04	4,68E-12	0,005
168	3	D	07.02.2011	Tank	Direct	620	Cu 63(MR)	0,109	3,1	1,09E-03	1,72E-11	0,017
169	4	P	07.02.2011	Tank	Direct	621	Cu 63(MR)	0,026	12,0	2,62E-04	4,11E-12	0,004
170	4	D	07.02.2011	Tank	Direct	622	Cu 63(MR)	-0,005	8,1	-4,99E-05	-7,85E-13	-0,001
171	5	P	07.02.2011	Tank	Direct	623	Cu 63(MR)	0,006	15,8	5,89E-05	9,26E-13	0,001
172	5	D	07.02.2011	Tank	Direct	624	Cu 63(MR)	0,008	7,9	7,84E-05	1,23E-12	0,001
173	6	P	08.02.2011	Tank	Direct	625	Cu 63(MR)	-0,002	8,5	-1,65E-05	-2,59E-13	0,000
174	6	D	08.02.2011	Tank	Direct	626	Cu 63(MR)	-0,003	3,7	-2,77E-05	-4,35E-13	0,000
175	7	P	08.02.2011	Tank	Direct	627	Cu 63(MR)	-0,013	5,5	-1,27E-04	-2,00E-12	-0,002
176	7	D	08.02.2011	Tank	Direct	628	Cu 63(MR)	-0,018	6,3	-1,84E-04	-2,89E-12	-0,003
177	8	P	08.02.2011	Tank	Direct	629	Cu 63(MR)	-0,024	17,2	-2,37E-04	-3,73E-12	-0,004
178	8	D	08.02.2011	Tank	Direct	630	Cu 63(MR)	0,173	52,0	1,73E-03	2,72E-11	0,027
179	9	P	08.02.2011	Tank	Direct	631	Cu 63(MR)	0,025	7,8	2,54E-04	3,99E-12	0,004
180	9	D	08.02.2011	Tank	Direct	632	Cu 63(MR)	0,021	11,1	2,12E-04	3,33E-12	0,003

181	10	P	08.02.2011	Tank	Direct	633	Cu 63(MR)	0,015	8,2	1,49E-04	2,34E-12	0,002
182	10	D	08.02.2011	Tank	Direct	634	Cu 63(MR)	0,028	15,8	2,82E-04	4,43E-12	0,004
183	1	P	10.02.2011	Tank	Direct	635	Cu 63(MR)	0,017	3,4	1,72E-04	2,71E-12	0,003
184	1	D	10.02.2011	Tank	Direct	636	Cu 63(MR)	0,027	4,5	2,68E-04	4,21E-12	0,004
185	2	P	10.02.2011	Tank	Direct	637	Cu 63(MR)	0,017	10,8	1,75E-04	2,75E-12	0,003
186	2	D	10.02.2011	Tank	Direct	638	Cu 63(MR)	0,055	10,6	5,53E-04	8,70E-12	0,009
187	3	P	10.02.2011	Tank	Direct	639	Cu 63(MR)	0,024	16,7	2,42E-04	3,81E-12	0,004
188	3	D	10.02.2011	Tank	Direct	640	Cu 63(MR)	0,019	14,0	1,95E-04	3,06E-12	0,003
189	4	P	10.02.2011	Tank	Direct	641	Cu 63(MR)	0,041	18,6	4,12E-04	6,47E-12	0,006
190	4	D	10.02.2011	Tank	Direct	642	Cu 63(MR)	-0,013	10,6	-1,27E-04	-1,99E-12	-0,002
191	5	P	10.02.2011	Tank	Direct	643	Cu 63(MR)	0,007	14,7	6,89E-05	1,08E-12	0,001
192	5	D	10.02.2011	Tank	Direct	644	Cu 63(MR)	-0,045	6,6	-4,50E-04	-7,08E-12	-0,007
193	6	P	11.02.2011	Tank	Direct	645	Cu 63(MR)	-0,006	3,6	-5,89E-05	-9,26E-13	-0,001
194	6	D	11.02.2011	Tank	Direct	646	Cu 63(MR)	0,023	6,9	2,32E-04	3,65E-12	0,004
195	7	P	11.02.2011	Tank	Direct	647	Cu 63(MR)	0,012	15,4	1,16E-04	1,83E-12	0,002
196	7	D	11.02.2011	Tank	Direct	648	Cu 63(MR)	-0,011	17,0	-1,13E-04	-1,78E-12	-0,002
197	8	P	11.02.2011	Tank	Direct	649	Cu 63(MR)	0,026	11,8	2,56E-04	4,03E-12	0,004
198	8	D	11.02.2011	Tank	Direct	650	Cu 63(MR)	0,003	6,6	3,36E-05	5,28E-13	0,001
199	9	P	11.02.2011	Tank	Direct	651	Cu 63(MR)	-0,022	11,5	-2,21E-04	-3,48E-12	-0,003
200	9	D	11.02.2011	Tank	Direct	652	Cu 63(MR)	0,017	6,6	1,67E-04	2,63E-12	0,003
201	10	P	11.02.2011	Tank	Direct	653	Cu 63(MR)	0,013	11,6	1,32E-04	2,08E-12	0,002
202	10	D	11.02.2011	Tank	Direct	654	Cu 63(MR)	0,000	14,0	4,36E-06	6,86E-14	0,000
203	1	P	13.02.2011	Tank	Direct	655	Cu 63(MR)	-0,029	10,8	-2,86E-04	-4,50E-12	-0,004
204	1	D	13.02.2011	Tank	Direct	656	Cu 63(MR)	-0,027	8,1	-2,66E-04	-4,18E-12	-0,004
205	2	P	13.02.2011	Tank	Direct	657	Cu 63(MR)	-0,030	6,0	-3,00E-04	-4,71E-12	-0,005
206	2	D	13.02.2011	Tank	Direct	658	Cu 63(MR)	-0,012	8,5	-1,24E-04	-1,94E-12	-0,002
207	3	P	13.02.2011	Tank	Direct	659	Cu 63(MR)	-0,010	9,8	-1,02E-04	-1,61E-12	-0,002
208	3	D	13.02.2011	Tank	Direct	660	Cu 63(MR)	-0,045	5,8	-4,47E-04	-7,02E-12	-0,007
209	4	P	13.02.2011	Tank	Direct	661	Cu 63(MR)	0,105	1,7	1,05E-03	1,66E-11	0,017

210	4	D	13.02.2011	Tank	Direct	662	Cu 63(MR)	0,030	16,1	3,05E-04	4,79E-12	0,005
211	5	P	13.02.2011	Tank	Direct	663	Cu 63(MR)	0,011	5,3	1,06E-04	1,67E-12	0,002
212	5	D	13.02.2011	Tank	Direct	664	Cu 63(MR)	-0,036	3,8	-3,64E-04	-5,72E-12	-0,006
213	6	P	14.02.2011	Tank	Direct	665	Cu 63(MR)	0,003	6,3	3,40E-05	5,34E-13	0,001
214	6	D	14.02.2011	Tank	Direct	666	Cu 63(MR)	-0,057	4,4	-5,71E-04	-8,98E-12	-0,009
215	7	P	14.02.2011	Tank	Direct	667	Cu 63(MR)	-0,043	4,7	-4,33E-04	-6,80E-12	-0,007
216	7	D	14.02.2011	Tank	Direct	668	Cu 63(MR)	0,011	9,0	1,12E-04	1,76E-12	0,002
217	8	P	14.02.2011	Tank	Direct	669	Cu 63(MR)	-0,081	11,4	-8,11E-04	-1,28E-11	-0,013
218	8	D	14.02.2011	Tank	Direct	670	Cu 63(MR)	-0,065	11,8	-6,52E-04	-1,03E-11	-0,010
219	9	P	14.02.2011	Tank	Direct	671	Cu 63(MR)	0,033	7,4	3,26E-04	5,13E-12	0,005
220	9	D	14.02.2011	Tank	Direct	672	Cu 63(MR)	-0,037	5,9	-3,71E-04	-5,84E-12	-0,006
221	10	P	14.02.2011	Tank	Direct	673	Cu 63(MR)	-0,070	11,7	-7,02E-04	-1,10E-11	-0,011
222	10	D	14.02.2011	Tank	Direct	674	Cu 63(MR)	-0,055	9,4	-5,55E-04	-8,73E-12	-0,009
	0 m	P		Depth Profile	Direct	675	Cu 63(MR)	0,081	8,4	8,06E-04	1,27E-11	0,013
	0 m	D		Depth Profile	Direct	676	Cu 63(MR)	-0,039	6,8	-3,91E-04	-6,16E-12	-0,006
	4 m	P		Depth Profile	Direct	677	Cu 63(MR)	0,030	11,2	3,04E-04	4,78E-12	0,005
	4 m	D		Depth Profile	Direct	678	Cu 63(MR)	-0,015	9,5	-1,46E-04	-2,29E-12	-0,002
	10 m	P		Depth Profile	Direct	679	Cu 63(MR)	-0,025	5,8	-2,48E-04	-3,90E-12	-0,004
	10 m	D		Depth Profile	Direct	680	Cu 63(MR)	-0,016	9,2	-1,62E-04	-2,54E-12	-0,003
	30 m	P		Depth Profile	Direct	681	Cu 63(MR)	-0,040	7,4	-3,95E-04	-6,22E-12	-0,006
	30 m	D		Depth Profile	Direct	682	Cu 63(MR)	-0,048	10,3	-4,81E-04	-7,57E-12	-0,008
	50 m	P		Depth Profile	Direct	683	Cu 63(MR)	-0,022	12,8	-2,19E-04	-3,44E-12	-0,003
	50 m	D		Depth Profile	Direct	684	Cu 63(MR)	-0,044	9,2	-4,44E-04	-6,99E-12	-0,007
	70 m	P		Depth Profile	Direct	685	Cu 63(MR)	-0,033	3,9	-3,25E-04	-5,11E-12	-0,005
	70 m	D		Depth Profile	Direct	686	Cu 63(MR)	-0,053	5,6	-5,35E-04	-8,41E-12	-0,008
A		P		River	Direct	687	Cu 63(MR)	-0,050	8,0	-4,98E-04	-7,83E-12	-0,008
A		D		River	Direct	688	Cu 63(MR)	-0,012	14,0	-1,15E-04	-1,81E-12	-0,002
B		P		River	Direct	689	Cu 63(MR)	0,019	16,5	1,94E-04	3,04E-12	0,003
B		D		River	Direct	690	Cu 63(MR)	-0,005	5,8	-5,31E-05	-8,35E-13	-0,001

C		P		River	Direct	691	Cu 63(MR)	0,004	10,0	4,19E-05	6,59E-13	0,001
C		D		River	Direct	692	Cu 63(MR)	0,021	6,3	2,11E-04	3,32E-12	0,003